Computer algebra independent integration tests

Summer 2022 edition

2-Exponentials/55-2.3-Exponential-functions

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Contents

Chapter 1

Introduction

Local contents

This report gives the result of running the computer algebra independent integration test.

The download section in the appendix contains links to download the problems in plain text format used for all CAS systems.

The number of integrals in this report is [770]. This is test number [55].

1.1 Listing of CAS systems tested

The following are the CAS systems tested:

1. Mathematica 13.1 (June 29, 2022) on windows 10.
2. Rubi 4.16.1 (Dec 19, 2018) on Mathematica 13.0.1 on windows 10.
3. Maple 2022.1 (June 1, 2022) on windows 10.
4. Maxima 5.46 (April 13, 2022) using Lisp SBCL 2.1.11.debian on Linux via sagemath 9.6.
5. Fricas 1.3.8 (June 21, 2022) based on sbcl 2.1.11.debian on Linux via sagemath 9.6.
6. Giac/Xcas 1.9.0-13 (July 3, 2022) on Linux via sagemath 9.6.
7. Sympy 1.10.1 (March 20, 2022) Using Python 3.10.4 on Linux.
8. Mupad using Matlab 2021a with Symbolic Math Toolbox Version 8.7 on windows 10.

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

Sympy was called directly from Python.

1.2 Results

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

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

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

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

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

System	% solved	% Failed
Rubi	99.74 (768)	0.26 (2)
Mathematica	97.01 (747)	2.99 (23)
Fricas	89.09 (686)	10.91 (84)
Maple	81.82 (630)	18.18 (140)
Mupad	74.81 (576)	25.19 (194)
Maxima	64.94 (500)	35.06 (270)
Giac	47.53 (366)	52.47 (404)
Sympy	44.68 (344)	55.32 (426)

Table 1.1: Percentage solved for each CAS

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

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

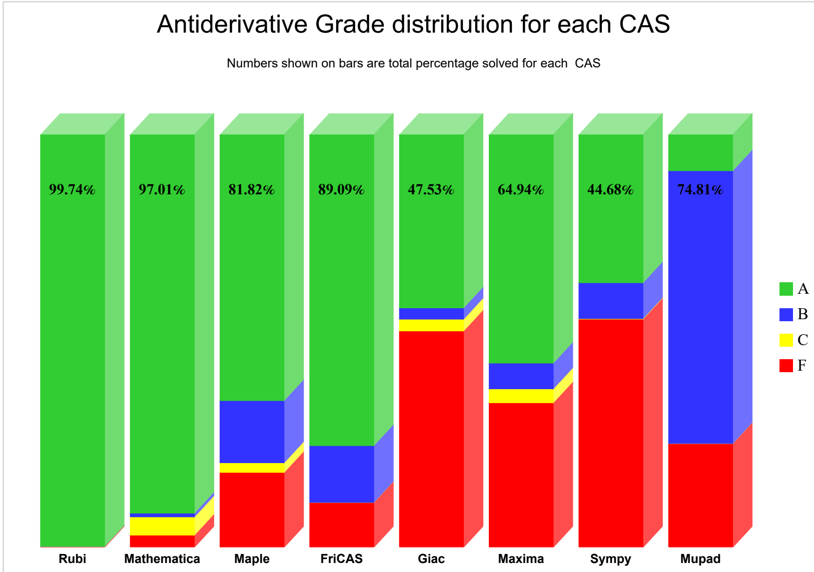
Table 1.2: Description of grading applied to integration result

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

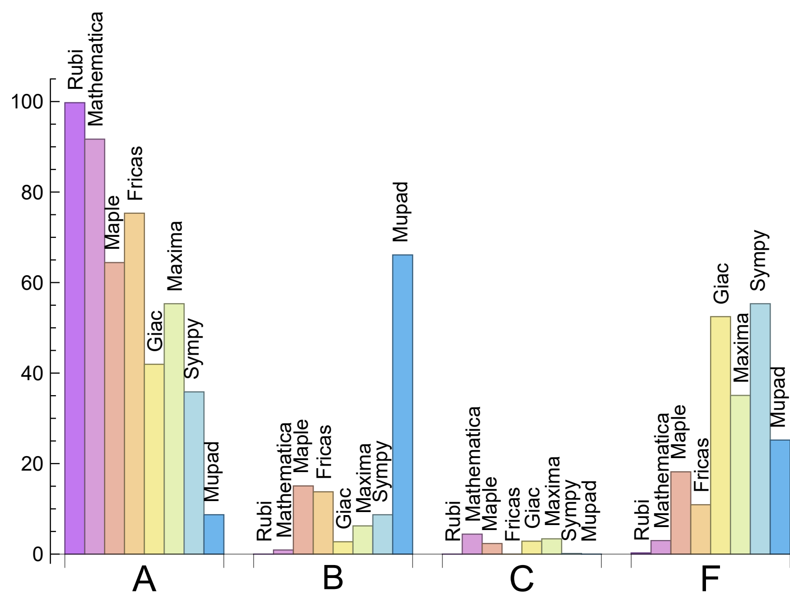
System	% A grade	% B grade	% C grade	% F grade
Rubi	99.74	0.00	0.00	0.26
Mathematica	91.69	0.91	4.42	2.99
Fricas	75.32	13.77	0.00	10.91
Maple	64.42	15.06	2.34	18.18
Maxima	55.32	6.23	3.38	35.06
Giac	41.95	2.73	2.86	52.47
Sympy	35.84	8.70	0.13	55.32
Mupad	N/A	66.10	0.00	25.19

Table 1.3: Antiderivative Grade distribution of each CAS

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



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



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

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

The third is due to an exception generated. Assigned **F(-2)**. This most likely indicates an interface problem between sagemath and the CAS (applicable only to FriCAS, Maxima and

Giac) or it could be an indication of an internal error in CAS. This type of error requires more investigations to determine the cause.

System	Number failed	Percentage normal failure	Percentage timeout failure	Percentage exception failure
Rubi	2	100.00 %	0.00 %	0.00 %
Mathematica	23	100.00 %	0.00 %	0.00 %
Maple	140	100.00 %	0.00 %	0.00 %
Fricas	84	76.19 %	0.00 %	23.81 %
Giac	404	98.02 %	0.99 %	0.99 %
Maxima	270	91.85 %	0.00 %	8.15 %
Sympy	426	78.64 %	19.48 %	1.88 %
Mupad	194	100.00 %	0.00 %	0.00 %

Table 1.4: Failure statistics for each CAS

1.3 Time and leaf size Performance

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

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

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

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

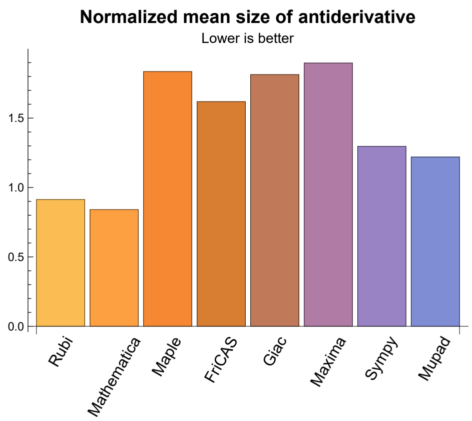
Similarly the **Normalized median** is relative to the median leaf size of the optimal.

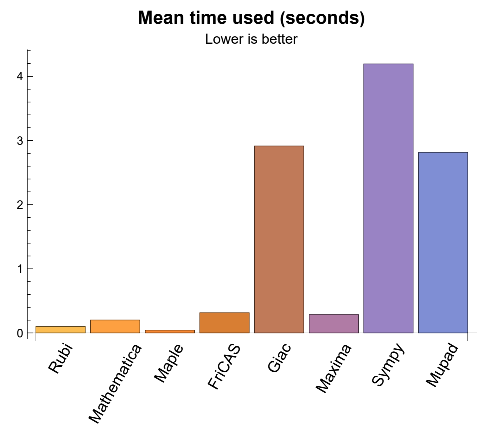
For example, if a CAS has Normalized median of 1.2, then its median is 1.2 as large as the median leaf size of the optimal.

System	Mean time (sec)	Mean size	Normalized mean	Median size	Normalized median
Rubi	0.10	72.85	0.91	46.00	1.00
Mathematica	0.20	61.38	0.84	37.00	0.96
Maple	0.04	134.27	1.84	48.50	1.00
Maxima	0.29	127.29	1.90	24.00	0.83
Fricas	0.31	121.57	1.62	57.00	1.00
Sympy	4.19	72.96	1.30	24.00	0.89
Giac	2.91	105.01	1.81	24.00	0.86
Mupad	2.82	66.91	1.22	38.00	0.91

Table 1.5: Time and leaf size performance for each CAS

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


Normalized mean size of antiderivative
Lower is better
0.0
0.5
1.0
1.5
Rubi
Mathematica
Maple
FriCAS
Giac
Maxima
Sympy
Mupad


Mean time used (seconds)
Lower is better
0
1
2
3
4
Rubi
Mathematica
Maple
FriCAS
Giac
Maxima
Sympy
Mupad

1.4 list of integrals that has no closed form antiderivative

$\{199, 200, 201, 205, 206, 207, 213, 214, 229, 230, 231, 237, 238, 239, 240, 241, 243, 244, 245, 246, 251, 252, 253, 388, 389, 390, 395, 396, 413, 414, 415, 420, 421, 430, 431, 436, 437, 442, 443, 447, 448, 449, 543, 548, 549, 550, 555, 556, 576, 577, 594, 599, 600, 601, 609, 614, 615, 616, 747, 748, 749, 751, 754, 758, 759, 760, 761\}$

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

Rubi {}

Mathematica {}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

Mupad {}

1.6 list of integrals solved by CAS but failed verification

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

Rubi {}

Mathematica {}

Maple Verification phase not implemented yet.

Maxima Verification phase not implemented yet.

Fricas Verification phase not implemented yet.

Sympy Verification phase not implemented yet.

Giac Verification phase not implemented yet.

Mupad Verification phase not implemented yet.

1.7 Timing

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

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

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

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

1.8 Verification

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

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

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

1.9 Important notes about some of the results

1.9.1 Important note about Maxima results

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

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

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

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

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

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

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

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

```
maxima_lib.set('extra_integration_methods', '[]')
```

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

1.9.2 Important note about FriCAS result

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

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

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

1.9.3 Important note about finding leaf size of antiderivative

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

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

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

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

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

  except Exception as ee:
       leafCount =1
```

1.9.4 Important note about Mupad results

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

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

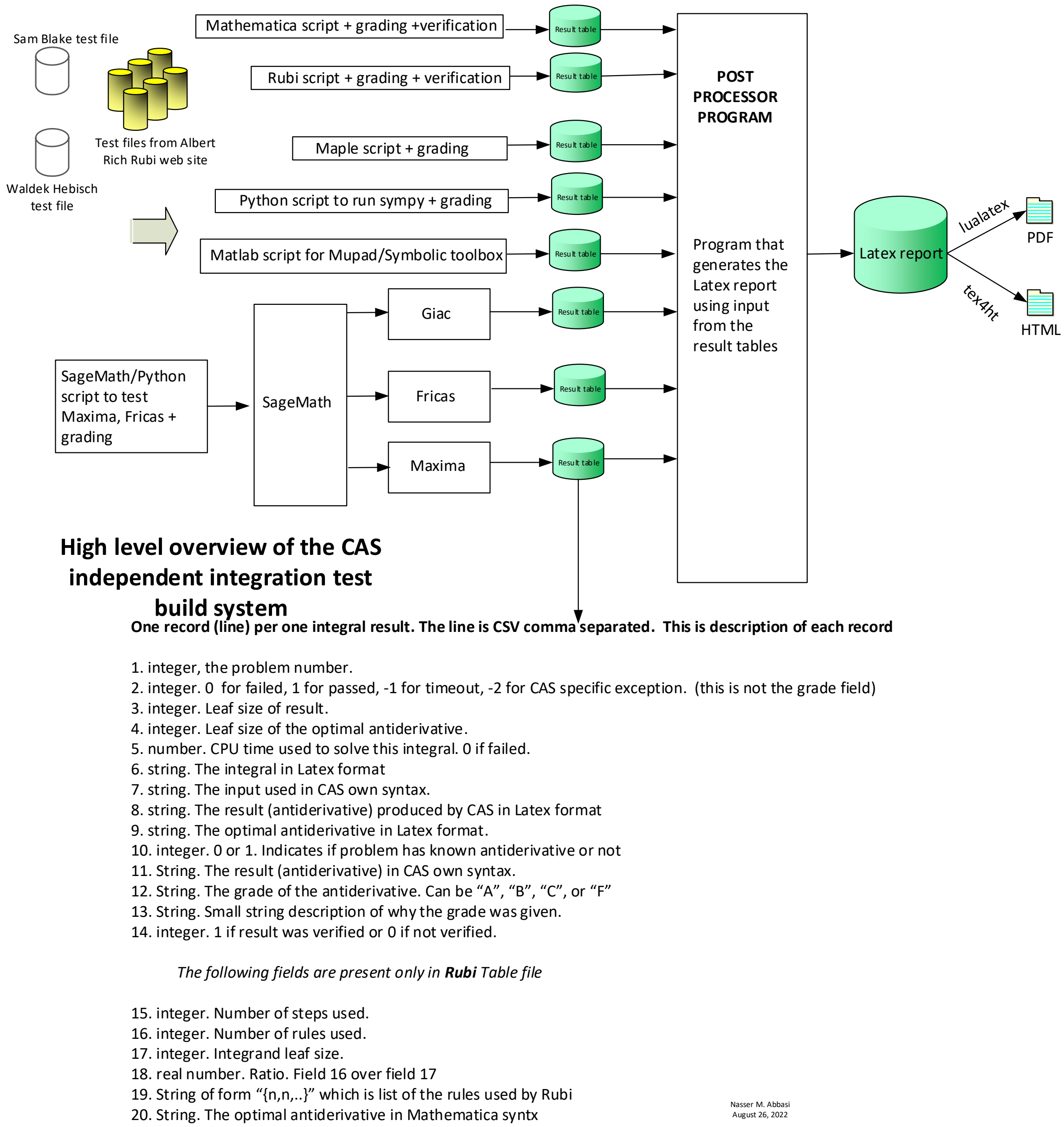
The following is an example of using Matlab's symbolic toolbox (Mupad) to solve an integral

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

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

1.10 Design of the test system

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



Chapter 2

detailed summary tables of results

Local contents

2.1 List of integrals sorted by grade for each CAS

Local contents

2.1.1 Rubi

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 693, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770 }

B grade: { }

C grade: { }

F grade: { 692, 694 }

2.1.2 Mathematica

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 401, 402, 403, 404, 405, 406, 407, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 525, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 543, 547, 548, 549, 550, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 569, 570, 571, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 632, 633, 634, 635, 637, 638, 639, 641, 642, 643, 644, 645, 646, 647, 649, 650, 651, 652, 653, 654, 655, 658, 659, 660, 661, 662, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770 }

B grade: { 572, 573, 631, 636, 648, 656, 657 }

C grade: { 70, 71, 96, 97, 126, 127, 139, 140, 165, 166, 183, 184, 255, 256, 281, 282, 312, 313, 325, 326, 351, 352, 368, 369, 370, 371, 372, 462, 463, 464, 465, 466, 640, 663 }

F grade: { 16, 17, 399, 400, 408, 423, 424, 425, 524, 526, 541, 542, 544, 545, 546, 551, 552, 553, 567, 568, 586, 587, 602 }

2.1.3 Maple

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, 36, 38, 39, 40, 41, 42, 44, 47, 48, 51, 52, 54, 55, 58, 59, 60, 61, 62, 63, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 96, 97, 98, 99, 100, 101, 114, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 161, 162, 163, 164, 165, 166, 179, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 205, 206, 207, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 237, 238, 239, 240, 241, 243, 244, 245, 246, 251, 252, 253, 258, 259, 260, 261, 262, 263, 264, 273, 274, 275, 276, 277, 278, 279, 285, 286, 305, 306, 307, 308, 309, 310, 311, 319, 320, 321, 322, 323, 324, 331, 332, 333, 334, 335, 336, 337, 338, 339, 347, 348, 349, 364, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 380, 381, 386, 387, 388, 389, 390, 395, 396, 397, 398, 399, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 420, 421, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 469, 473, 474, 475, 476, 477, 478, 479, 480, 487, 488, 493, 494, 495, 496, 497, 498, 499, 500, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 520, 523, 525, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 543, 547, 548, 549, 550, 555, 556, 563, 564, 565, 569, 570, 571, 576, 577, 594, 599, 600, 601, 609, 614, 615, 616, 617, 618, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 637, 638, 639, 640, 641, 642, 643, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 666, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762 }

B grade: { 33, 35, 37, 43, 69, 80, 81, 95, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 115, 116, 117, 128, 129, 130, 154, 155, 156, 157, 158, 159, 160, 167, 168, 169, 170, 171, 172, 173, 242, 255, 256, 257, 265, 266, 267, 268, 269, 270, 271, 272, 281, 282, 283, 284, 302, 303, 304, 312, 313, 315, 316, 317, 318, 325, 326, 327, 328, 329, 330, 350, 351, 352, 378, 379, 382, 383, 384, 385, 400, 401, 402, 422, 423, 424, 425, 444, 465, 466, 467, 468, 470, 471, 472, 481, 482, 483, 484, 485, 486, 521, 522, 524, 527, 528, 540, 541, 554, 574, 575, 578, 636, 644, 665, 704 }

C grade: { 174, 175, 176, 177, 178, 180, 181, 182, 566, 567, 568, 591, 606, 668, 763, 764, 765, 766 }

F grade: { 17, 45, 46, 49, 50, 53, 56, 57, 64, 65, 66, 67, 68, 202, 203, 204, 208, 209, 210, 211, 212, 232, 233, 234, 235, 236, 247, 248, 249, 250, 254, 280, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 314, 340, 341, 342, 343, 344, 345, 346, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 365, 366, 367, 391, 392, 393, 394, 416, 417, 418, 419, 489, 490, 491, 492, 501, 502, 503, 504, 517, 518, 519, 526, 539, 542, 544, 545, 546, 551, 552, 553, 557, 558, 559, 560, 561, 562, 572, 573, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 592, 593, 595, 596, 597, 598, 602, 603, 604, 605, 607, 608, 610, 611, 612, 613, 619, 667, 726, 767, 768, 769, 770 }

2.1.4 Maxima

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 22, 23, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 40, 41, 42, 43, 47, 51, 54, 58, 59, 60, 61, 62, 65, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 128, 129, 130, 131, 132, 133, 134, 135, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 198, 199, 200, 201, 205, 206, 207, 213, 214, 215, 229, 230, 231, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 251, 252, 253, 260, 273, 286, 299, 300, 308, 321, 322, 347, 368, 369, 370, 371, 372, 373, 387, 388, 389, 390, 395, 396, 413, 414, 415, 420, 421, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 447, 448, 449, 452, 458, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 485, 486, 488, 490, 492, 493, 494, 495, 496, 497, 498, 499, 500, 502, 504, 505, 506, 507, 508, 510, 511, 515, 516, 520, 523, 525, 529, 530, 531, 532, 533, 534, 535, 536, 543, 547, 548, 549, 550, 555, 556, 563, 564, 566, 567, 568, 571, 576, 577, 594, 599, 600, 601, 609, 614, 615, 616, 617, 618, 623, 636, 637, 639, 640, 641, 642, 643, 645, 646, 647, 648, 649, 650, 651, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 719, 721, 722, 723, 724, 725, 727, 728, 730, 732, 733, 734, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 770 }

B grade: { 20, 21, 24, 25, 39, 197, 267, 268, 269, 270, 271, 272, 281, 282, 283, 284, 285, 323, 324, 325, 326, 348, 349, 350, 351, 352, 382, 383, 384, 385, 386, 444, 445, 446, 451, 457, 483, 484, 487, 554, 638, 644, 652, 665, 704, 718, 720, 731 }

C grade: { 123, 124, 125, 126, 127, 136, 137, 138, 139, 140, 162, 163, 164, 165, 166, 255, 256, 257, 258, 259, 450, 456, 620, 621, 622, 735 }

F grade: { 44, 45, 46, 48, 49, 50, 52, 53, 55, 56, 57, 63, 64, 66, 67, 68, 202, 203, 204, 208, 209, 210, 211, 212, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 232, 233, 234, 235, 236, 247, 248, 249, 250, 254, 261, 262, 263, 264, 265, 266, 274, 275, 276, 277, 278, 279, 280, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 301, 302, 303, 304, 305, 306, 307, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 374, 375, 376, 377, 378, 379, 380, 381, 391, 392, 393, 394, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 416, 417, 418, 419, 422, 423, 424, 425, 453, 454, 455, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 489, 491, 501, 503, 509, 512, 513, 514, 517, 518, 519, 521, 522, 524, 526, 527, 528, 537, 538, 539, 540, 541, 542, 544, 545, 546, 551, 552, 553, 557, 558, 559, 560, 561, 562, 565, 569, 570, 572, 573, 574, 575, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 595, 596, 597, 598, 602, 603, 604, 605, 606, 607, 608, 610, 611, 612, 613, 619, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 726, 729, 767, 768, 769 }

2.1.5 FriCAS

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 40, 41, 42, 43, 44, 45, 46, 47, 49, 50, 51, 54, 55, 56, 57, 58, 59, 60, 62, 65, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 108, 109, 110, 111, 112, 113, 114, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 179, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 251, 252, 253, 254, 257, 258, 259, 260, 261, 267, 268, 270, 271, 272, 273, 274, 275, 280, 284, 285, 286, 294, 295, 299, 300, 304, 305, 306, 307, 308, 309, 310, 311, 317, 318, 319, 320, 322, 329, 330, 331, 332, 333, 334, 338, 339, 356, 357, 364, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 401, 402, 403, 404, 405, 406, 407, 409, 410, 411, 412, 413, 414, 415, 416, 417, 420, 421, 422, 423, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 547, 548, 549, 555, 556, 563, 564, 565, 566, 567, 568, 569, 570, 571, 576, 577, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 637, 640, 641, 642, 643, 645, 646, 647, 649, 650, 651, 653, 654, 655, 656, 658, 659, 660, 661, 662, 663, 664, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 682, 683, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 705, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 721, 722, 723, 724, 725, 726, 727, 729, 730, 731, 733, 734, 735, 737, 738, 739, 740, 741, 742, 743, 757, 758, 760, 761, 762, 769 }

B grade: { 20, 24, 39, 48, 52, 53, 61, 63, 64, 80, 81, 106, 107, 116, 117, 129, 130, 155, 156, 236, 255, 256, 262, 263, 264, 265, 266, 269, 276, 277, 278, 279, 281, 282, 283, 287, 288, 289, 290, 291, 292, 293, 296, 297, 298, 302, 303, 312, 313, 315, 316, 321, 323, 324, 325, 326, 327, 328, 335, 336, 337, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 358, 378, 379, 399, 400, 408, 418, 419, 424, 425, 554, 572, 573, 574, 575, 578, 636, 638, 639, 644, 648, 652, 657, 665, 681, 684, 704, 706, 720, 728 }

C grade: { }

F grade: { 66, 67, 68, 115, 128, 154, 174, 175, 176, 177, 178, 180, 181, 182, 193, 194, 247, 248, 249, 250, 301, 314, 340, 359, 360, 361, 362, 363, 365, 366, 367, 543, 544, 545, 546, 550, 551, 552, 553, 557, 558, 559, 560, 561, 562, 579, 580, 581, 582, 583, 584, 585, 627, 628, 629, 630, 631, 632, 633, 634, 635, 732, 736, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 759, 763, 764, 765, 766, 767, 768, 770 }

2.1.6 Sympy

A grade: { 1, 2, 3, 4, 8, 9, 10, 18, 19, 21, 22, 23, 25, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 43, 47, 51, 54, 58, 59, 62, 70, 71, 72, 73, 74, 75, 96, 97, 98, 99, 100, 101, 114, 122, 123, 124, 125, 126, 127, 135, 136, 137, 138, 139, 140, 161, 162, 163, 164, 165, 166, 183, 184, 189, 190, 191, 193, 194, 199, 200, 201, 205, 206, 207, 213, 214, 215, 229, 230, 231, 237, 238, 239, 240, 241, 243, 244, 245, 246, 251, 252, 253, 260, 299, 308, 309, 310, 311, 322, 388, 389, 390, 395, 413, 414, 420, 421, 430, 431, 435, 436, 437, 442, 443, 447, 448, 449, 452, 458, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 497, 498, 499, 500, 505, 506, 507, 508, 509, 520, 521, 522, 527, 528, 529, 530, 532, 533, 535, 536, 537, 540, 543, 548, 549, 550, 555, 575, 576, 592, 599, 614, 617, 618, 620, 621, 622, 623, 624, 625, 629, 630, 632, 633, 636, 639, 640, 641, 642, 644, 645, 646, 647, 648, 650, 651, 654, 655, 656, 657, 658, 663, 664, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 682, 683, 685, 686, 687, 688, 690, 691, 692, 693, 694, 695, 696, 697, 702, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 719, 721, 722, 723, 724, 725, 727, 729, 730, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 747, 748, 749, 751, 752, 754, 757, 758, 759, 760, 761 }

B grade: { 5, 6, 7, 11, 12, 13, 14, 16, 20, 24, 38, 39, 185, 255, 256, 257, 258, 259, 281, 282, 283, 284, 285, 286, 312, 313, 321, 323, 324, 325, 326, 347, 348, 349, 350, 351, 352, 450, 456, 547, 554, 563, 564, 565, 569, 571, 588, 589, 590, 596, 597, 598, 631, 637, 638, 649, 652, 653, 662, 665, 666, 703, 704, 718, 720, 728, 762 }

C grade: { 765 }

F grade: { 15, 17, 26, 40, 41, 42, 44, 45, 46, 48, 49, 50, 52, 53, 55, 56, 57, 60, 61, 63, 64, 65, 66, 67, 68, 69, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 115, 116, 117, 118, 119, 120, 121, 128, 129, 130, 131, 132, 133, 134, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 186, 187, 188, 192, 195, 196, 197, 198, 202, 203, 204, 208, 209, 210, 211, 212, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 232, 233, 234, 235, 236, 242, 247, 248, 249, 250, 254, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 300, 301, 302, 303, 304, 305, 306, 307, 314, 315, 316, 317, 318, 319, 320, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 391, 392, 393, 394, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 415, 416, 417, 418, 419, 422, 423, 424, 425, 426, 427, 428, 429, 432, 433, 434, 438, 439, 440, 441, 444, 445, 446, 451, 453, 454, 455, 457, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 493, 494, 495, 496, 501, 502, 503, 504, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 523, 524, 525, 526, 531, 534, 538, 539, 541, 542, 544, 545, 546, 551, 552, 553, 556, 557, 558, 559, 560, 561, 562, 566, 567, 568, 570, 572, 573, 574, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 591, 593, 594, 595, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 615, 616, 619, 626, 627, 628, 634, 635, 643, 659, 660, 661, 681, 684, 689, 698, 699, 700, 701, 705, 726, 731, 744, 745, 746, 750, 753, 755, 756, 763, 764, 766, 767, 768, 769, 770 }

2.1.7 Giac

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 43, 47, 51, 54, 58, 62, 65, 70, 71, 72, 73, 75, 82, 83, 84, 85, 86, 87, 88, 97, 98, 99, 101, 114, 122, 135, 161, 185, 191, 194, 195, 196, 197, 198, 199, 200, 201, 205, 206, 207, 213, 214, 215, 229, 230, 231, 237, 238, 239, 240, 241, 243, 244, 245, 246, 251, 252, 253, 255, 256, 257, 258, 260, 267, 268, 269, 270, 271, 272, 273, 286, 308, 373, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 395, 396, 403, 404, 405, 413, 414, 415, 420, 421, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 451, 452, 457, 458, 474, 476, 478, 480, 482, 484, 486, 488, 490, 492, 494, 496, 498, 500, 502, 504, 505, 506, 507, 508, 509, 521, 522, 527, 528, 529, 530, 532, 535, 536, 537, 540, 543, 547, 548, 549, 550, 575, 576, 577, 590, 594, 598, 599, 600, 601, 605, 609, 613, 614, 615, 616, 617, 618, 620, 621, 622, 623, 624, 636, 637, 640, 641, 642, 643, 645, 646, 647, 648, 649, 650, 651, 653, 654, 655, 656, 658, 659, 660, 661, 662, 663, 664, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 705, 707, 708, 709, 710, 711, 712, 713, 714, 715, 717, 718, 719, 721, 722, 723, 727, 728, 730, 731, 732, 733, 735, 737, 738, 739, 740, 741, 742, 743, 747, 748, 749, 751, 752, 754, 757, 758, 759, 760, 761, 762 }

B grade: { 39, 283, 284, 321, 347, 401, 402, 406, 407, 408, 554, 638, 639, 644, 652, 657, 665, 704, 706, 720, 729 }

C grade: { 74, 100, 259, 285, 299, 300, 323, 450, 456, 563, 564, 565, 569, 570, 571, 586, 627, 628, 629, 630, 631, 736 }

F grade: { 40, 41, 42, 44, 45, 46, 48, 49, 50, 52, 53, 55, 56, 57, 59, 60, 61, 63, 64, 66, 67, 68, 69, 76, 77, 78, 79, 80, 81, 89, 90, 91, 92, 93, 94, 95, 96, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 115, 116, 117, 118, 119, 120, 121, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 186, 187, 188, 189, 190, 192, 193, 202, 203, 204, 208, 209, 210, 211, 212, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 232, 233, 234, 235, 236, 242, 247, 248, 249, 250, 254, 261, 262, 263, 264, 265, 266, 274, 275, 276, 277, 278, 279, 280, 281, 282, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 301, 302, 303, 304, 305, 306, 307, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 322, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 374, 375, 376, 377, 378, 379, 391, 392, 393, 394, 397, 398, 399, 400, 409, 410, 411, 412, 416, 417, 418, 419, 422, 423, 424, 425, 453, 454, 455, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 475, 477, 479, 481, 483, 485, 487, 489, 491, 493, 495, 497, 499, 501, 503, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 523, 524, 525, 526, 531, 533, 534, 538, 539, 541, 542, 544, 545, 546, 551, 552, 553, 555, 556, 557, 558, 559, 560, 561, 562, 566, 567, 568, 572, 573, 574, 578, 579, 580, 581, 582, 583, 584, 585, 587, 588, 589, 591, 592, 593, 595, 596, 597, 602, 603, 604, 606, 607, 608, 610, 611, 612, 619, 625, 626, 632, 633, 634, 635, 716, 724, 725, 726, 734, 744, 745, 746, 750, 753, 755, 756, 763, 764, 765, 766, 767, 768, 769, 770 }

2.1.8 Mupad

A grade: { 199, 200, 201, 205, 206, 207, 213, 214, 229, 230, 231, 237, 238, 239, 240, 241, 243, 244, 245, 246, 251, 252, 253, 388, 389, 390, 395, 396, 413, 414, 415, 420, 421, 430, 431, 436, 437, 442, 443, 447, 448, 449, 543, 548, 549, 550, 555, 556, 576, 577, 594, 599, 600, 601, 609, 614, 615, 616, 747, 748, 749, 751, 754, 758, 759, 760, 761 }

B grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 43, 47, 51, 54, 58, 59, 62, 65, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 180, 181, 182, 185, 194, 195, 196, 197, 198, 215, 218, 219, 220, 228, 236, 242, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 365, 366, 367, 373, 380, 381, 382, 383, 384, 385, 386, 387, 403, 404, 405, 412, 419, 426, 427, 428, 429, 432, 433, 434, 435, 438, 439, 440, 441, 444, 445, 446, 450, 451, 452, 454, 456, 457, 458, 460, 473, 474, 475, 476, 478, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 505, 506, 507, 508, 509, 520, 521, 522, 527, 528, 529, 530, 532, 533, 535, 536, 537, 540, 547, 554, 563, 564, 565, 566, 567, 568, 569, 570, 571, 575, 581, 591, 606, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 726, 727, 728, 729, 730, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 750, 752, 753, 755, 756, 757, 765, 766, 767, 768, 770 }

C grade: { }

F grade: { 17, 40, 41, 42, 44, 45, 46, 48, 49, 50, 52, 53, 55, 56, 57, 60, 61, 63, 64, 66, 67, 68, 110, 111, 177, 178, 179, 183, 184, 186, 187, 188, 189, 190, 191, 192, 193, 202, 203, 204, 208, 209, 210, 211, 212, 216, 217, 221, 222, 223, 224, 225, 226, 227, 232, 233, 234, 235, 247, 248, 249, 250, 294, 295, 362, 363, 364, 368, 369, 370, 371, 372, 374, 375, 376, 377, 378, 379, 391, 392, 393, 394, 397, 398, 399, 400, 401, 402, 406, 407, 408, 409, 410, 411, 416, 417, 418, 422, 423, 424, 425, 453, 455, 459, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 477, 479, 501, 502, 503, 504, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 523, 524, 525, 526, 531, 534, 538, 539, 541, 542, 544, 545, 546, 551, 552, 553, 557, 558, 559, 560, 561, 562, 572, 573, 574, 578, 579, 580, 582, 583, 584, 585, 586, 587, 588, 589, 590, 592, 593, 595, 596, 597, 598, 602, 603, 604, 605, 607, 608, 610, 611, 612, 613, 636, 667, 705, 725, 731, 762, 763, 764, 769 }

2.2 Detailed conclusion table per each integral for all CAS systems

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

In this table,the column `N.S.` in the table below, which stands for **normalized size** is defined as $\frac{\text{antiderivative leaf size}}{\text{optimal antiderivative leaf size}}$. To help make the table fit, **`Mathematica`** was abbreviated to **`MMA`**.

Problem 1	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	10	9	9	8	9	9
N.S.	1	1.00	1.00	0.83	0.75	0.75	0.67	0.75	0.75
time (sec)	N/A	0.011	0.014	0.010	0.329	0.421	0.034	2.484	0.053

Problem 2	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	12	11	11	8	12	11
N.S.	1	1.00	1.00	1.00	0.92	0.92	0.67	1.00	0.92
time (sec)	N/A	0.013	0.013	0.009	0.331	0.384	0.037	3.067	0.057

Problem 3	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	23	22	22	19	23	22
N.S.	1	1.00	1.00	0.96	0.92	0.92	0.79	0.96	0.92
time (sec)	N/A	0.048	0.021	0.018	0.282	0.365	0.062	2.547	0.122

Problem 4	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	22	19	18	18	14	19	18
N.S.	1	1.00	1.16	1.00	0.95	0.95	0.74	1.00	0.95
time (sec)	N/A	0.024	0.021	0.023	0.330	0.377	0.059	2.446	0.049

Problem 5	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	19	20	19	22	56	19	19
N.S.	1	1.00	0.95	1.00	0.95	1.10	2.80	0.95	0.95
time (sec)	N/A	0.015	0.033	0.017	0.280	0.469	0.306	1.532	3.500

Problem 6	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	31	31	30	36	114	30	44
N.S.	1	1.00	0.97	0.97	0.94	1.12	3.56	0.94	1.38
time (sec)	N/A	0.050	0.053	0.027	0.275	0.453	2.914	2.249	3.547

Problem 7	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	26	27	26	33	107	26	26
N.S.	1	1.00	0.96	1.00	0.96	1.22	3.96	0.96	0.96
time (sec)	N/A	0.027	0.046	0.015	0.281	0.438	5.523	2.912	3.477

Problem 8	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	21	17	16	16	12	17	16
N.S.	1	1.00	1.31	1.06	1.00	1.00	0.75	1.06	1.00
time (sec)	N/A	0.015	0.018	0.014	0.279	0.360	0.043	3.037	3.442

Problem 9	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	33	28	28	24	30	28
N.S.	1	1.00	1.00	1.18	1.00	1.00	0.86	1.07	1.00
time (sec)	N/A	0.051	0.023	0.015	0.283	0.413	0.194	2.944	3.578

Problem 10	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	30	24	23	23	17	24	23
N.S.	1	1.00	1.30	1.04	1.00	1.00	0.74	1.04	1.00
time (sec)	N/A	0.026	0.002	0.000	0.296	0.365	0.049	2.575	0.002

Problem 11	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	25	24	28	82	24	24
N.S.	1	1.00	1.00	1.04	1.00	1.17	3.42	1.00	1.00
time (sec)	N/A	0.016	0.048	0.027	0.284	0.405	0.453	1.948	3.480

Problem 12	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	35	48	36	50	71	36	55
N.S.	1	1.00	0.97	1.33	1.00	1.39	1.97	1.00	1.53
time (sec)	N/A	0.053	0.059	0.044	0.282	0.397	2.888	3.190	3.532

Problem 13	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	30	32	31	39	71	31	52
N.S.	1	1.00	0.97	1.03	1.00	1.26	2.29	1.00	1.68
time (sec)	N/A	0.024	0.061	0.023	0.273	0.362	2.741	2.793	3.428

Problem 14	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	24	25	24	29	80	24	24
N.S.	1	1.00	0.96	1.00	0.96	1.16	3.20	0.96	0.96
time (sec)	N/A	0.026	0.094	0.021	0.282	0.348	0.761	2.503	3.510

Problem 15	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	36	31	24	29	0	24	24
N.S.	1	1.00	0.97	0.84	0.65	0.78	0.00	0.65	0.65
time (sec)	N/A	0.049	0.033	0.016	0.305	0.369	0.000	3.161	3.436

Problem 16	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	A	A	A	B	A	B
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	0	42	40	55	90	43	74
N.S.	1	1.00	0.00	1.02	0.98	1.34	2.20	1.05	1.80
time (sec)	N/A	0.052	0.342	0.037	0.287	0.355	223.787	2.941	3.514

Problem 17	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	A	A	F(-1)	A	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	0	0	86	90	0	156	-1
N.S.	1	1.00	0.00	0.00	1.08	1.12	0.00	1.95	-0.01
time (sec)	N/A	0.095	0.349	0.231	0.309	0.406	0.000	2.947	0.000

Problem 18	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	21	20	19	20	21	20
N.S.	1	1.00	1.00	0.95	0.91	0.86	0.91	0.95	0.91
time (sec)	N/A	0.021	0.020	0.025	0.277	0.402	0.050	2.958	3.571

Problem 19	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	26	26	28	31	24	26	27
N.S.	1	1.00	0.96	0.96	1.04	1.15	0.89	0.96	1.00
time (sec)	N/A	0.024	0.038	0.014	0.286	0.373	0.050	3.315	3.612

Problem 20	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	26	29	61	35	37	20	29
N.S.	1	1.00	1.24	1.38	2.90	1.67	1.76	0.95	1.38
time (sec)	N/A	0.016	0.031	0.016	0.307	0.359	0.049	3.666	3.560

Problem 21	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	26	29	85	47	51	20	53
N.S.	1	1.00	0.76	0.85	2.50	1.38	1.50	0.59	1.56
time (sec)	N/A	0.025	0.032	0.018	0.275	0.391	0.064	3.561	3.597

Problem 22	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	28	26	25	24	27	26	24
N.S.	1	1.00	0.90	0.84	0.81	0.77	0.87	0.84	0.77
time (sec)	N/A	0.023	0.024	0.013	0.318	0.438	0.067	2.862	0.068

Problem 23	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	33	32	34	38	32	32	34
N.S.	1	1.00	0.89	0.86	0.92	1.03	0.86	0.86	0.92
time (sec)	N/A	0.027	0.040	0.014	0.283	0.465	0.056	3.491	3.549

Problem 24	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	30	33	67	39	41	24	31
N.S.	1	1.00	1.30	1.43	2.91	1.70	1.78	1.04	1.35
time (sec)	N/A	0.018	0.030	0.014	0.285	0.381	0.051	3.176	3.565

Problem 25	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	30	33	91	51	54	24	55
N.S.	1	1.00	0.79	0.87	2.39	1.34	1.42	0.63	1.45
time (sec)	N/A	0.031	0.032	0.019	0.286	0.397	0.087	3.295	3.601

Problem 26	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	31	27	32	25	0	32	26
N.S.	1	1.00	0.74	0.64	0.76	0.60	0.00	0.76	0.62
time (sec)	N/A	0.034	0.034	0.011	0.286	0.355	0.000	1.976	3.495

Problem 27	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	22	15	21	15	15	15
N.S.	1	1.00	1.00	1.38	0.94	1.31	0.94	0.94	0.94
time (sec)	N/A	0.014	0.011	0.014	0.298	0.343	0.050	2.320	0.075

Problem 28	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	36	34	30	34	39	30	30
N.S.	1	1.00	1.12	1.06	0.94	1.06	1.22	0.94	0.94
time (sec)	N/A	0.026	0.028	0.013	0.284	0.387	0.063	2.672	0.093

Problem 29	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	53	49	47	48	71	47	44
N.S.	1	1.00	1.02	0.94	0.90	0.92	1.37	0.90	0.85
time (sec)	N/A	0.031	0.036	0.014	0.287	0.376	0.075	2.622	3.520

Problem 30	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	40	42	32	39	49	38	38
N.S.	1	1.00	1.00	1.05	0.80	0.98	1.22	0.95	0.95
time (sec)	N/A	0.031	0.032	0.014	0.279	0.391	0.068	2.841	3.566

Problem 31	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	59	59	57	84	78	59	86
N.S.	1	1.00	0.97	0.97	0.93	1.38	1.28	0.97	1.41
time (sec)	N/A	0.040	0.070	0.034	0.315	0.446	0.084	1.831	3.666

Problem 32	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	79	75	85	140	114	76	104
N.S.	1	1.00	0.95	0.90	1.02	1.69	1.37	0.92	1.25
time (sec)	N/A	0.049	0.070	0.022	0.287	0.395	0.112	1.677	0.192

Problem 33	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	50	91	37	188	51	48	64
N.S.	1	1.00	1.00	1.82	0.74	3.76	1.02	0.96	1.28
time (sec)	N/A	0.053	0.073	0.043	0.498	0.398	0.407	2.940	3.848

Problem 34	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	47	32	34	42	37	37
N.S.	1	1.00	1.00	1.38	0.94	1.00	1.24	1.09	1.09
time (sec)	N/A	0.057	0.035	0.020	0.314	0.358	0.479	3.065	3.634

Problem 35	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	67	171	68	234	110	74	66
N.S.	1	1.00	0.76	1.94	0.77	2.66	1.25	0.84	0.75
time (sec)	N/A	0.047	0.108	0.059	0.522	0.420	0.830	3.134	3.548

Problem 36	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	73	76	65	57	92	69	47
N.S.	1	1.00	1.20	1.25	1.07	0.93	1.51	1.13	0.77
time (sec)	N/A	0.042	0.395	0.026	0.287	0.367	0.601	2.428	3.543

Problem 37	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	127	127	86	212	89	285	184	113	102
N.S.	1	1.00	0.68	1.67	0.70	2.24	1.45	0.89	0.80
time (sec)	N/A	0.060	0.107	0.062	0.484	0.410	0.891	2.632	3.556

Problem 38	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	4	4	4	4	3	3	15	3	3
N.S.	1	1.00	1.00	1.00	0.75	0.75	3.75	0.75	0.75
time (sec)	N/A	0.012	0.014	0.023	0.481	0.365	0.038	2.803	3.475

Problem 39	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	4	4	4	4	15	15	15	16	15
N.S.	1	1.00	1.00	1.00	3.75	3.75	3.75	4.00	3.75
time (sec)	N/A	0.013	0.024	0.017	0.285	0.375	0.033	1.482	0.133

Problem 40	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	38	34	31	31	0	0	-1
N.S.	1	1.00	1.41	1.26	1.15	1.15	0.00	0.00	-0.04
time (sec)	N/A	0.040	0.075	0.027	0.288	0.365	0.000	0.000	0.000

Problem 41	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	60	51	48	48	0	0	-1
N.S.	1	1.00	1.50	1.28	1.20	1.20	0.00	0.00	-0.02
time (sec)	N/A	0.071	0.079	0.014	0.286	0.387	0.000	0.000	0.000

Problem 42	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	84	74	71	71	0	0	-1
N.S.	1	1.00	1.22	1.07	1.03	1.03	0.00	0.00	-0.01
time (sec)	N/A	0.086	0.081	0.015	0.281	0.359	0.000	0.000	0.000

Problem 43	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	53	21	86	24	21	21
N.S.	1	1.00	1.00	1.77	0.70	2.87	0.80	0.70	0.70
time (sec)	N/A	0.021	0.029	0.030	0.480	0.426	0.080	2.568	3.500

Problem 44	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	108	134	0	112	0	0	-1
N.S.	1	1.00	0.98	1.22	0.00	1.02	0.00	0.00	-0.01
time (sec)	N/A	0.079	0.070	0.038	0.000	0.360	0.000	0.000	0.000

Problem 45	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	184	184	168	0	0	176	0	0	-1
N.S.	1	1.00	0.91	0.00	0.00	0.96	0.00	0.00	-0.01
time (sec)	N/A	0.130	0.061	0.012	0.000	0.365	0.000	0.000	0.000

Problem 46	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	268	268	224	0	0	239	0	0	-1
N.S.	1	1.00	0.84	0.00	0.00	0.89	0.00	0.00	-0.00
time (sec)	N/A	0.169	0.064	0.011	0.000	0.371	0.000	0.000	0.000

Problem 47	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	53	82	49	164	53	49	49
N.S.	1	1.00	0.90	1.39	0.83	2.78	0.90	0.83	0.83
time (sec)	N/A	0.028	0.094	0.027	0.479	0.375	0.122	2.854	3.498

Problem 48	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	172	172	271	195	0	311	0	0	-1
N.S.	1	1.00	1.58	1.13	0.00	1.81	0.00	0.00	-0.01
time (sec)	N/A	0.116	0.109	0.037	0.000	0.378	0.000	0.000	0.000

Problem 49	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	333	333	477	0	0	388	0	0	-1
N.S.	1	1.00	1.43	0.00	0.00	1.17	0.00	0.00	-0.00
time (sec)	N/A	0.275	0.114	0.013	0.000	0.386	0.000	0.000	0.000

Problem 50	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	501	501	434	0	0	549	0	0	-1
N.S.	1	1.00	0.87	0.00	0.00	1.10	0.00	0.00	-0.00
time (sec)	N/A	0.375	0.209	0.018	0.000	0.391	0.000	0.000	0.000

Problem 51	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	68	94	76	258	85	61	79
N.S.	1	1.00	0.81	1.12	0.90	3.07	1.01	0.73	0.94
time (sec)	N/A	0.034	0.107	0.035	0.489	0.412	0.128	1.482	3.570

Problem 52	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	223	223	184	223	0	494	0	0	-1
N.S.	1	1.00	0.83	1.00	0.00	2.22	0.00	0.00	-0.00
time (sec)	N/A	0.155	0.249	0.047	0.000	0.408	0.000	0.000	0.000

Problem 53	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	420	420	353	0	0	786	0	0	-1
N.S.	1	1.00	0.84	0.00	0.00	1.87	0.00	0.00	-0.00
time (sec)	N/A	0.422	0.366	0.030	0.000	0.432	0.000	0.000	0.000

Problem 54	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	22	24	86	26	21	21
N.S.	1	1.00	1.00	0.73	0.80	2.87	0.87	0.70	0.70
time (sec)	N/A	0.014	0.028	0.025	0.488	0.400	0.077	1.845	3.510

Problem 55	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	108	134	0	112	0	0	-1
N.S.	1	1.00	0.98	1.22	0.00	1.02	0.00	0.00	-0.01
time (sec)	N/A	0.068	0.070	0.027	0.000	0.367	0.000	0.000	0.000

Problem 56	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	184	184	168	0	0	176	0	0	-1
N.S.	1	1.00	0.91	0.00	0.00	0.96	0.00	0.00	-0.01
time (sec)	N/A	0.126	0.063	0.008	0.000	0.381	0.000	0.000	0.000

Problem 57	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	268	268	224	0	0	239	0	0	-1
N.S.	1	1.00	0.84	0.00	0.00	0.89	0.00	0.00	-0.00
time (sec)	N/A	0.166	0.063	0.009	0.000	0.418	0.000	0.000	0.000

Problem 58	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	23	21	23	21	22	20	20
N.S.	1	1.00	1.05	0.95	1.05	0.95	1.00	0.91	0.91
time (sec)	N/A	0.015	0.028	0.015	0.276	0.409	0.044	1.440	3.610

Problem 59	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	48	56	54	61	54	0	51
N.S.	1	1.00	0.76	0.89	0.86	0.97	0.86	0.00	0.81
time (sec)	N/A	0.055	0.065	0.018	0.290	0.367	0.080	0.000	3.610

Problem 60	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	90	91	83	159	0	0	-1
N.S.	1	1.00	0.92	0.93	0.85	1.62	0.00	0.00	-0.01
time (sec)	N/A	0.121	0.073	0.026	0.295	0.387	0.000	0.000	0.000

Problem 61	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	124	119	107	241	0	0	-1
N.S.	1	1.00	0.97	0.93	0.84	1.88	0.00	0.00	-0.01
time (sec)	N/A	0.155	0.084	0.030	0.291	0.345	0.000	0.000	0.000

Problem 62	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	70	62	90	261	87	66	113
N.S.	1	1.00	0.80	0.71	1.03	3.00	1.00	0.76	1.30
time (sec)	N/A	0.035	0.594	0.047	0.484	0.388	0.132	3.045	3.643

Problem 63	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	196	196	209	209	0	352	0	0	-1
N.S.	1	1.00	1.07	1.07	0.00	1.80	0.00	0.00	-0.01
time (sec)	N/A	0.383	0.190	0.051	0.000	0.379	0.000	0.000	0.000

Problem 64	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	316	316	254	0	0	674	0	0	-1
N.S.	1	1.00	0.80	0.00	0.00	2.13	0.00	0.00	-0.00
time (sec)	N/A	0.876	0.359	0.023	0.000	0.373	0.000	0.000	0.000

Problem 65	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	93	0	90	139	0	131	130
N.S.	1	1.00	0.98	0.00	0.95	1.46	0.00	1.38	1.37
time (sec)	N/A	0.128	0.204	0.009	0.282	0.355	0.000	1.797	0.105

Problem 66	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	106	106	92	0	0	0	0	0	-1
N.S.	1	1.00	0.87	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.064	0.080	0.033	0.000	0.000	0.000	0.000	0.000

Problem 67	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	75	0	0	0	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.094	0.172	0.010	0.000	0.000	0.000	0.000	0.000

Problem 68	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	84	0	0	0	0	0	-1
N.S.	1	1.00	0.99	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.094	0.191	0.010	0.000	0.000	0.000	0.000	0.000

Problem 69	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	46	140	38	40	0	0	49
N.S.	1	1.00	1.00	3.04	0.83	0.87	0.00	0.00	1.07
time (sec)	N/A	0.016	0.024	0.027	0.063	0.107	0.000	0.000	3.628

Problem 70	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	24	76	92	75	94	79	76
N.S.	1	1.00	0.31	0.97	1.18	0.96	1.21	1.01	0.97
time (sec)	N/A	0.035	0.032	0.027	0.300	0.351	0.059	4.205	3.559

Problem 71	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	24	64	77	63	80	67	63
N.S.	1	1.00	0.37	0.98	1.18	0.97	1.23	1.03	0.97
time (sec)	N/A	0.024	0.030	0.021	0.292	0.361	0.055	3.441	3.539

Problem 72	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	53	52	62	51	66	55	52
N.S.	1	1.00	0.62	0.60	0.72	0.59	0.77	0.64	0.60
time (sec)	N/A	0.063	0.034	0.019	0.283	0.352	0.049	3.348	3.497

Problem 73	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	41	40	47	39	53	43	39
N.S.	1	1.00	0.66	0.65	0.76	0.63	0.85	0.69	0.63
time (sec)	N/A	0.042	0.031	0.016	0.282	0.355	0.051	4.182	3.509

Problem 74	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	29	28	32	27	39	689	27
N.S.	1	1.00	0.66	0.64	0.73	0.61	0.89	15.66	0.61
time (sec)	N/A	0.026	0.028	0.014	0.282	0.357	0.039	3.150	3.459

Problem 75	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	19	18	18	22	18	18
N.S.	1	1.00	1.00	0.95	0.90	0.90	1.10	0.90	0.90
time (sec)	N/A	0.009	0.021	0.023	0.279	0.365	0.031	4.579	3.298

Problem 76	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	16	13	13	0	0	13
N.S.	1	1.00	1.00	1.07	0.87	0.87	0.00	0.00	0.87
time (sec)	N/A	0.015	0.024	0.017	0.321	0.422	0.000	0.000	3.181

Problem 77	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	32	35	18	35	0	0	32
N.S.	1	1.00	0.91	1.00	0.51	1.00	0.00	0.00	0.91
time (sec)	N/A	0.029	0.039	0.025	0.321	0.364	0.000	0.000	3.427

Problem 78	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	48	57	22	48	0	0	57
N.S.	1	1.00	0.83	0.98	0.38	0.83	0.00	0.00	0.98
time (sec)	N/A	0.050	0.037	0.030	0.323	0.359	0.000	0.000	3.533

Problem 79	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	59	79	22	59	0	0	69
N.S.	1	1.00	0.73	0.98	0.27	0.73	0.00	0.00	0.85
time (sec)	N/A	0.067	0.042	0.035	0.318	0.365	0.000	0.000	3.543

Problem 80	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	101	22	71	0	0	90
N.S.	1	1.00	1.00	4.21	0.92	2.96	0.00	0.00	3.75
time (sec)	N/A	0.015	0.028	0.043	0.056	0.089	0.000	0.000	3.565

Problem 81	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	123	22	83	0	0	102
N.S.	1	1.00	1.00	5.12	0.92	3.46	0.00	0.00	4.25
time (sec)	N/A	0.015	0.028	0.057	0.058	0.080	0.000	0.000	3.511

Problem 82	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	123	127	113	0	116	154
N.S.	1	1.00	1.00	3.62	3.74	3.32	0.00	3.41	4.53
time (sec)	N/A	0.015	0.044	0.097	0.021	0.082	0.000	0.835	3.625

Problem 83	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	111	112	101	0	104	139
N.S.	1	1.00	1.00	3.26	3.29	2.97	0.00	3.06	4.09
time (sec)	N/A	0.023	0.041	0.043	0.021	0.087	0.000	2.310	3.575

Problem 84	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	95	99	97	89	0	92	116
N.S.	1	1.00	0.74	0.77	0.76	0.70	0.00	0.72	0.91
time (sec)	N/A	0.101	0.064	0.033	0.292	0.345	0.000	3.264	3.546

Problem 85	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	83	87	82	77	0	80	98
N.S.	1	1.00	0.79	0.83	0.78	0.73	0.00	0.76	0.93
time (sec)	N/A	0.079	0.059	0.027	0.281	0.392	0.000	2.557	3.519

Problem 86	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	71	75	67	65	0	68	75
N.S.	1	1.00	0.87	0.91	0.82	0.79	0.00	0.83	0.91
time (sec)	N/A	0.044	0.052	0.023	0.282	0.374	0.000	2.272	3.543

Problem 87	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	59	54	53	49	0	57	54
N.S.	1	1.00	1.00	0.92	0.90	0.83	0.00	0.97	0.92
time (sec)	N/A	0.028	0.043	0.020	0.290	0.477	0.000	2.559	3.612

Problem 88	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	37	26	25	32	0	26	26
N.S.	1	1.00	1.00	0.70	0.68	0.86	0.00	0.70	0.70
time (sec)	N/A	0.005	0.029	0.018	0.285	0.360	0.000	2.060	3.551

Problem 89	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	44	28	40	0	0	44
N.S.	1	1.00	1.00	0.90	0.57	0.82	0.00	0.00	0.90
time (sec)	N/A	0.026	0.047	0.021	0.339	0.358	0.000	0.000	3.468

Problem 90	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	62	67	28	57	0	0	70
N.S.	1	1.00	0.85	0.92	0.38	0.78	0.00	0.00	0.96
time (sec)	N/A	0.043	0.069	0.025	0.324	0.365	0.000	0.000	3.562

Problem 91	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	77	86	28	73	0	0	109
N.S.	1	1.00	0.80	0.90	0.29	0.76	0.00	0.00	1.14
time (sec)	N/A	0.060	0.064	0.030	0.327	0.383	0.000	0.000	3.558

Problem 92	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	119	119	89	98	28	85	0	0	131
N.S.	1	1.00	0.75	0.82	0.24	0.71	0.00	0.00	1.10
time (sec)	N/A	0.075	0.071	0.041	0.323	0.399	0.000	0.000	3.486

Problem 93	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	110	28	97	0	0	153
N.S.	1	1.00	1.00	3.24	0.82	2.85	0.00	0.00	4.50
time (sec)	N/A	0.017	0.048	0.045	0.326	0.385	0.000	0.000	3.513

Problem 94	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	122	28	109	0	0	175
N.S.	1	1.00	1.00	3.59	0.82	3.21	0.00	0.00	5.15
time (sec)	N/A	0.015	0.049	0.065	0.316	0.390	0.000	0.000	3.631

Problem 95	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	46	140	38	40	0	0	56
N.S.	1	1.00	1.00	3.04	0.83	0.87	0.00	0.00	1.22
time (sec)	N/A	0.015	0.022	0.027	0.068	0.081	0.000	0.000	3.392

Problem 96	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	A	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	24	76	92	75	94	0	76
N.S.	1	1.00	0.31	0.97	1.18	0.96	1.21	0.00	0.97
time (sec)	N/A	0.026	0.047	0.038	0.286	0.382	0.060	0.000	3.662

Problem 97	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	24	64	77	63	80	105	63
N.S.	1	1.00	0.37	0.98	1.18	0.97	1.23	1.62	0.97
time (sec)	N/A	0.023	0.036	0.030	0.286	0.381	0.054	2.443	3.539

Problem 98	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	53	52	62	51	66	83	51
N.S.	1	1.00	0.63	0.62	0.74	0.61	0.79	0.99	0.61
time (sec)	N/A	0.068	0.038	0.024	0.288	0.391	0.061	3.899	3.457

Problem 99	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	41	40	47	39	53	61	39
N.S.	1	1.00	0.61	0.60	0.70	0.58	0.79	0.91	0.58
time (sec)	N/A	0.048	0.032	0.019	0.282	0.415	0.045	2.251	3.474

Problem 100	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	29	28	32	27	39	689	27
N.S.	1	1.00	0.66	0.64	0.73	0.61	0.89	15.66	0.61
time (sec)	N/A	0.031	0.029	0.014	0.281	0.405	0.039	2.501	3.246

Problem 101	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	19	18	18	22	18	18
N.S.	1	1.00	1.00	0.95	0.90	0.90	1.10	0.90	0.90
time (sec)	N/A	0.015	0.013	0.012	0.284	0.388	0.033	2.488	3.469

Problem 102	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	41	13	13	0	0	13
N.S.	1	1.00	1.00	2.73	0.87	0.87	0.00	0.00	0.87
time (sec)	N/A	0.015	0.024	0.016	0.316	0.411	0.000	0.000	3.239

Problem 103	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	32	97	18	35	0	0	32
N.S.	1	1.00	0.91	2.77	0.51	1.00	0.00	0.00	0.91
time (sec)	N/A	0.028	0.031	0.022	0.324	0.361	0.000	0.000	3.527

Problem 104	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	48	141	22	48	0	0	57
N.S.	1	1.00	0.83	2.43	0.38	0.83	0.00	0.00	0.98
time (sec)	N/A	0.043	0.038	0.028	0.322	0.351	0.000	0.000	3.319

Problem 105	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	59	177	22	59	0	0	69
N.S.	1	1.00	0.73	2.19	0.27	0.73	0.00	0.00	0.85
time (sec)	N/A	0.060	0.044	0.030	0.331	0.371	0.000	0.000	3.527

Problem 106	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	213	22	71	0	0	90
N.S.	1	1.00	1.00	8.88	0.92	2.96	0.00	0.00	3.75
time (sec)	N/A	0.015	0.028	0.036	0.057	0.099	0.000	0.000	3.576

Problem 107	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	249	22	83	0	0	102
N.S.	1	1.00	1.00	10.38	0.92	3.46	0.00	0.00	4.25
time (sec)	N/A	0.014	0.030	0.041	0.057	0.094	0.000	0.000	3.470

Problem 108	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	106	28	49	0	0	71
N.S.	1	1.00	1.00	3.12	0.82	1.44	0.00	0.00	2.09
time (sec)	N/A	0.014	0.057	0.020	0.058	0.090	0.000	0.000	3.561

Problem 109	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	109	28	47	0	0	75
N.S.	1	1.00	1.00	3.21	0.82	1.38	0.00	0.00	2.21
time (sec)	N/A	0.016	0.048	0.028	0.058	0.115	0.000	0.000	3.185

Problem 110	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	75	28	29	0	0	-1
N.S.	1	1.00	1.00	2.21	0.82	0.85	0.00	0.00	-0.03
time (sec)	N/A	0.009	0.050	0.013	0.059	0.079	0.000	0.000	0.000

Problem 111	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	32	78	26	29	0	0	-1
N.S.	1	1.00	1.00	2.44	0.81	0.91	0.00	0.00	-0.03
time (sec)	N/A	0.003	0.052	0.013	0.056	0.100	0.000	0.000	0.000

Problem 112	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	100	28	38	0	0	63
N.S.	1	1.00	1.00	2.94	0.82	1.12	0.00	0.00	1.85
time (sec)	N/A	0.014	0.060	0.020	0.057	0.101	0.000	0.000	3.475

Problem 113	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	102	28	41	0	0	70
N.S.	1	1.00	1.00	3.00	0.82	1.21	0.00	0.00	2.06
time (sec)	N/A	0.015	0.060	0.019	0.058	0.106	0.000	0.000	3.584

Problem 114	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	11	11	9	8	8	7	8	8
N.S.	1	1.00	1.00	0.82	0.73	0.73	0.64	0.73	0.73
time (sec)	N/A	0.010	0.011	0.012	0.284	0.365	0.028	2.544	0.043

Problem 115	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	35	136	35	0	0	0	52
N.S.	1	1.00	1.00	3.89	1.00	0.00	0.00	0.00	1.49
time (sec)	N/A	0.014	0.007	0.040	0.061	0.000	0.000	0.000	3.505

Problem 116	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	121	22	80	0	0	99
N.S.	1	1.00	1.00	5.50	1.00	3.64	0.00	0.00	4.50
time (sec)	N/A	0.014	0.003	0.072	0.057	0.089	0.000	0.000	3.692

Problem 117	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	99	21	68	0	0	87
N.S.	1	1.00	1.00	4.71	1.00	3.24	0.00	0.00	4.14
time (sec)	N/A	0.016	0.003	0.061	0.057	0.117	0.000	0.000	3.626

Problem 118	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	79	79	53	77	22	56	0	0	66
N.S.	1	1.00	0.67	0.97	0.28	0.71	0.00	0.00	0.84
time (sec)	N/A	0.042	0.019	0.068	0.321	0.465	0.000	0.000	3.600

Problem 119	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	40	55	21	43	0	0	54
N.S.	1	1.00	0.71	0.98	0.38	0.77	0.00	0.00	0.96
time (sec)	N/A	0.029	0.015	0.067	0.318	0.375	0.000	0.000	3.640

Problem 120	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	31	18	30	0	0	27
N.S.	1	1.00	1.00	1.11	0.64	1.07	0.00	0.00	0.96
time (sec)	N/A	0.015	0.007	0.064	0.323	0.390	0.000	0.000	3.600

Problem 121	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	15	13	13	0	0	13
N.S.	1	1.00	1.00	1.15	1.00	1.00	0.00	0.00	1.00
time (sec)	N/A	0.012	0.003	0.063	0.321	0.362	0.000	0.000	3.489

Problem 122	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	19	18	20	20	20	18
N.S.	1	1.00	1.00	1.06	1.00	1.11	1.11	1.11	1.00
time (sec)	N/A	0.013	0.003	0.013	0.279	0.361	0.036	3.334	3.516

Problem 123	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	27	32	21	31	22	0	27
N.S.	1	1.00	0.69	0.82	0.54	0.79	0.56	0.00	0.69
time (sec)	N/A	0.025	0.006	0.015	0.321	0.437	0.041	0.000	3.547

Problem 124	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	41	44	22	43	39	0	45
N.S.	1	1.00	0.67	0.72	0.36	0.70	0.64	0.00	0.74
time (sec)	N/A	0.042	0.007	0.021	0.318	0.448	0.051	0.000	3.554

Problem 125	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	53	56	21	55	53	0	57
N.S.	1	1.00	0.65	0.68	0.26	0.67	0.65	0.00	0.70
time (sec)	N/A	0.058	0.008	0.024	0.319	0.434	0.052	0.000	3.545

Problem 126	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	22	68	22	67	66	0	69
N.S.	1	1.00	0.34	1.05	0.34	1.03	1.02	0.00	1.06
time (sec)	N/A	0.023	0.003	0.026	0.320	0.365	0.055	0.000	3.598

Problem 127	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	21	80	21	79	80	0	81
N.S.	1	1.00	0.27	1.04	0.27	1.03	1.04	0.00	1.05
time (sec)	N/A	0.025	0.003	0.029	0.323	0.370	0.059	0.000	3.649

Problem 128	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	46	169	38	0	0	0	54
N.S.	1	1.00	1.00	3.67	0.83	0.00	0.00	0.00	1.17
time (sec)	N/A	0.017	0.008	0.029	0.060	0.000	0.000	0.000	3.506

Problem 129	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	123	22	84	0	0	102
N.S.	1	1.00	1.00	5.12	0.92	3.50	0.00	0.00	4.25
time (sec)	N/A	0.018	0.003	0.049	0.058	0.114	0.000	0.000	3.791

Problem 130	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	101	22	72	0	0	90
N.S.	1	1.00	1.00	4.21	0.92	3.00	0.00	0.00	3.75
time (sec)	N/A	0.017	0.003	0.037	0.060	0.119	0.000	0.000	3.766

Problem 131	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	57	79	22	60	0	0	69
N.S.	1	1.00	0.70	0.98	0.27	0.74	0.00	0.00	0.85
time (sec)	N/A	0.063	0.017	0.034	0.328	0.357	0.000	0.000	3.738

Problem 132	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	44	57	22	47	0	0	57
N.S.	1	1.00	0.76	0.98	0.38	0.81	0.00	0.00	0.98
time (sec)	N/A	0.042	0.011	0.028	0.331	0.448	0.000	0.000	3.650

Problem 133	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	32	35	18	35	0	0	33
N.S.	1	1.00	0.91	1.00	0.51	1.00	0.00	0.00	0.94
time (sec)	N/A	0.026	0.005	0.025	0.320	0.376	0.000	0.000	3.572

Problem 134	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	16	13	13	0	0	13
N.S.	1	1.00	1.00	1.07	0.87	0.87	0.00	0.00	0.87
time (sec)	N/A	0.015	0.003	0.022	0.331	0.362	0.000	0.000	3.504

Problem 135	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	19	18	22	27	22	18
N.S.	1	1.00	1.00	0.95	0.90	1.10	1.35	1.10	0.90
time (sec)	N/A	0.015	0.004	0.013	0.279	0.347	0.038	3.023	3.446

Problem 136	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	32	35	22	34	29	0	36
N.S.	1	1.00	0.73	0.80	0.50	0.77	0.66	0.00	0.82
time (sec)	N/A	0.030	0.006	0.017	0.329	0.343	0.046	0.000	3.444

Problem 137	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	45	47	22	47	44	0	47
N.S.	1	1.00	0.73	0.76	0.35	0.76	0.71	0.00	0.76
time (sec)	N/A	0.046	0.007	0.022	0.318	0.387	0.058	0.000	3.552

Problem 138	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	58	59	22	60	58	0	60
N.S.	1	1.00	0.67	0.69	0.26	0.70	0.67	0.00	0.70
time (sec)	N/A	0.064	0.008	0.028	0.322	0.378	0.064	0.000	3.631

Problem 139	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	24	71	22	71	71	0	72
N.S.	1	1.00	0.35	1.03	0.32	1.03	1.03	0.00	1.04
time (sec)	N/A	0.024	0.004	0.038	0.315	0.389	0.071	0.000	3.601

Problem 140	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	24	83	22	84	85	0	84
N.S.	1	1.00	0.29	1.01	0.27	1.02	1.04	0.00	1.02
time (sec)	N/A	0.026	0.003	0.035	0.333	0.346	0.069	0.000	3.613

Problem 141	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	124	28	110	0	0	173
N.S.	1	1.00	1.00	3.65	0.82	3.24	0.00	0.00	5.09
time (sec)	N/A	0.016	0.004	0.086	0.330	0.432	0.000	0.000	3.660

Problem 142	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	112	28	98	0	0	151
N.S.	1	1.00	1.00	3.29	0.82	2.88	0.00	0.00	4.44
time (sec)	N/A	0.017	0.004	0.040	0.321	0.388	0.000	0.000	3.656

Problem 143	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	119	119	86	100	28	86	0	0	129
N.S.	1	1.00	0.72	0.84	0.24	0.72	0.00	0.00	1.08
time (sec)	N/A	0.091	0.027	0.034	0.322	0.410	0.000	0.000	3.661

Problem 144	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	74	88	28	74	0	0	107
N.S.	1	1.00	0.77	0.92	0.29	0.77	0.00	0.00	1.11
time (sec)	N/A	0.064	0.023	0.029	0.320	0.361	0.000	0.000	3.613

Problem 145	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	60	67	28	56	0	0	71
N.S.	1	1.00	0.82	0.92	0.38	0.77	0.00	0.00	0.97
time (sec)	N/A	0.045	0.019	0.026	0.319	0.380	0.000	0.000	3.607

Problem 146	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	44	26	42	0	0	44
N.S.	1	1.00	1.00	0.90	0.53	0.86	0.00	0.00	0.90
time (sec)	N/A	0.026	0.009	0.023	0.321	0.390	0.000	0.000	3.598

Problem 147	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	28	34	34	0	0	28
N.S.	1	1.00	1.00	0.72	0.87	0.87	0.00	0.00	0.72
time (sec)	N/A	0.020	0.005	0.022	0.313	0.380	0.000	0.000	3.522

Problem 148	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	63	58	28	58	0	0	58
N.S.	1	1.00	1.00	0.92	0.44	0.92	0.00	0.00	0.92
time (sec)	N/A	0.039	0.015	0.040	0.322	0.399	0.000	0.000	3.563

Problem 149	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	74	79	28	76	0	0	79
N.S.	1	1.00	0.86	0.92	0.33	0.88	0.00	0.00	0.92
time (sec)	N/A	0.055	0.037	0.033	0.331	0.388	0.000	0.000	3.594

Problem 150	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	86	91	28	88	0	0	102
N.S.	1	1.00	0.79	0.83	0.26	0.81	0.00	0.00	0.94
time (sec)	N/A	0.077	0.040	0.053	0.321	0.393	0.000	0.000	3.662

Problem 151	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	132	132	100	103	28	100	0	0	121
N.S.	1	1.00	0.76	0.78	0.21	0.76	0.00	0.00	0.92
time (sec)	N/A	0.100	0.061	0.048	0.323	0.360	0.000	0.000	3.691

Problem 152	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	115	28	112	0	0	142
N.S.	1	1.00	1.00	3.38	0.82	3.29	0.00	0.00	4.18
time (sec)	N/A	0.015	0.005	0.061	0.062	0.085	0.000	0.000	3.705

Problem 153	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	127	28	124	0	0	159
N.S.	1	1.00	1.00	3.74	0.82	3.65	0.00	0.00	4.68
time (sec)	N/A	0.014	0.007	0.082	0.057	0.093	0.000	0.000	3.714

Problem 154	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	46	169	38	0	0	0	54
N.S.	1	1.00	1.00	3.67	0.83	0.00	0.00	0.00	1.17
time (sec)	N/A	0.016	0.009	0.030	0.062	0.000	0.000	0.000	3.468

Problem 155	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	249	22	84	0	0	102
N.S.	1	1.00	1.00	10.38	0.92	3.50	0.00	0.00	4.25
time (sec)	N/A	0.018	0.003	0.041	0.057	0.090	0.000	0.000	3.827

Problem 156	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	213	22	72	0	0	90
N.S.	1	1.00	1.00	8.88	0.92	3.00	0.00	0.00	3.75
time (sec)	N/A	0.016	0.003	0.052	0.056	0.093	0.000	0.000	3.778

Problem 157	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	57	177	22	60	0	0	69
N.S.	1	1.00	0.70	2.19	0.27	0.74	0.00	0.00	0.85
time (sec)	N/A	0.064	0.016	0.034	0.317	0.402	0.000	0.000	3.701

Problem 158	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	44	141	22	47	0	0	57
N.S.	1	1.00	0.76	2.43	0.38	0.81	0.00	0.00	0.98
time (sec)	N/A	0.049	0.012	0.047	0.319	0.426	0.000	0.000	3.655

Problem 159	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	32	97	18	35	0	0	33
N.S.	1	1.00	0.91	2.77	0.51	1.00	0.00	0.00	0.94
time (sec)	N/A	0.031	0.005	0.030	0.321	0.357	0.000	0.000	3.666

Problem 160	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	41	13	13	0	0	13
N.S.	1	1.00	1.00	2.73	0.87	0.87	0.00	0.00	0.87
time (sec)	N/A	0.016	0.003	0.026	0.329	0.360	0.000	0.000	3.591

Problem 161	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	19	18	22	27	22	18
N.S.	1	1.00	1.00	0.95	0.90	1.10	1.35	1.10	0.90
time (sec)	N/A	0.015	0.004	0.014	0.282	0.349	0.037	2.809	3.442

Problem 162	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	32	35	22	34	29	0	36
N.S.	1	1.00	0.73	0.80	0.50	0.77	0.66	0.00	0.82
time (sec)	N/A	0.034	0.007	0.020	0.324	0.400	0.044	0.000	3.494

Problem 163	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	45	47	22	47	44	0	48
N.S.	1	1.00	0.67	0.70	0.33	0.70	0.66	0.00	0.72
time (sec)	N/A	0.046	0.008	0.025	0.330	0.408	0.052	0.000	3.541

Problem 164	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	58	59	22	60	58	0	60
N.S.	1	1.00	0.70	0.71	0.27	0.72	0.70	0.00	0.72
time (sec)	N/A	0.065	0.009	0.044	0.344	0.400	0.057	0.000	3.537

Problem 165	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	24	71	22	71	71	0	72
N.S.	1	1.00	0.35	1.03	0.32	1.03	1.03	0.00	1.04
time (sec)	N/A	0.024	0.004	0.037	0.315	0.370	0.062	0.000	3.516

Problem 166	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	24	83	22	84	85	0	84
N.S.	1	1.00	0.29	1.01	0.27	1.02	1.04	0.00	1.02
time (sec)	N/A	0.027	0.003	0.021	0.333	0.418	0.067	0.000	3.592

Problem 167	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	120	28	55	0	0	88
N.S.	1	1.00	1.00	3.53	0.82	1.62	0.00	0.00	2.59
time (sec)	N/A	0.017	0.004	0.029	0.058	0.086	0.000	0.000	3.573

Problem 168	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	115	28	51	0	0	80
N.S.	1	1.00	1.00	3.38	0.82	1.50	0.00	0.00	2.35
time (sec)	N/A	0.016	0.004	0.029	0.057	0.110	0.000	0.000	3.588

Problem 169	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	105	28	41	0	0	70
N.S.	1	1.00	1.00	3.09	0.82	1.21	0.00	0.00	2.06
time (sec)	N/A	0.010	0.004	0.024	0.058	0.100	0.000	0.000	3.572

Problem 170	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	32	98	26	38	0	0	48
N.S.	1	1.00	1.00	3.06	0.81	1.19	0.00	0.00	1.50
time (sec)	N/A	0.003	0.003	0.024	0.055	0.093	0.000	0.000	3.587

Problem 171	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	82	28	29	0	0	46
N.S.	1	1.00	1.00	2.41	0.82	0.85	0.00	0.00	1.35
time (sec)	N/A	0.016	0.005	0.025	0.060	0.093	0.000	0.000	3.582

Problem 172	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	78	28	29	0	0	33
N.S.	1	1.00	1.00	2.29	0.82	0.85	0.00	0.00	0.97
time (sec)	N/A	0.015	0.005	0.026	0.061	0.083	0.000	0.000	3.562

Problem 173	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	112	28	53	0	0	77
N.S.	1	1.00	1.00	3.29	0.82	1.56	0.00	0.00	2.26
time (sec)	N/A	0.015	0.005	0.029	0.060	0.115	0.000	0.000	3.536

Problem 174	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	46	280	47	0	0	0	79
N.S.	1	1.00	1.00	6.09	1.02	0.00	0.00	0.00	1.72
time (sec)	N/A	0.017	0.010	0.044	0.070	0.000	0.000	0.000	3.763

Problem 175	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	212	41	0	0	0	54
N.S.	1	1.00	1.00	5.44	1.05	0.00	0.00	0.00	1.38
time (sec)	N/A	0.017	0.006	0.029	0.067	0.000	0.000	0.000	3.608

Problem 176	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	212	41	0	0	0	54
N.S.	1	1.00	1.00	5.44	1.05	0.00	0.00	0.00	1.38
time (sec)	N/A	0.017	0.006	0.035	0.068	0.000	0.000	0.000	3.506

Problem 177	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	212	41	0	0	0	-1
N.S.	1	1.00	1.00	5.44	1.05	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.010	0.005	0.030	0.069	0.000	0.000	0.000	0.000

Problem 178	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	35	201	35	0	0	0	-1
N.S.	1	1.00	1.00	5.74	1.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.003	0.005	0.029	0.067	0.000	0.000	0.000	0.000

Problem 179	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	19	15	15	0	0	-1
N.S.	1	1.00	1.00	1.27	1.00	1.00	0.00	0.00	-0.07
time (sec)	N/A	0.016	0.003	0.064	0.324	0.370	0.000	0.000	0.000

Problem 180	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	37	195	37	0	0	0	52
N.S.	1	1.00	1.00	5.27	1.00	0.00	0.00	0.00	1.41
time (sec)	N/A	0.016	0.004	0.033	0.063	0.000	0.000	0.000	3.531

Problem 181	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	212	39	0	0	0	48
N.S.	1	1.00	1.00	5.44	1.00	0.00	0.00	0.00	1.23
time (sec)	N/A	0.016	0.004	0.016	0.067	0.000	0.000	0.000	3.518

Problem 182	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	212	39	0	0	0	52
N.S.	1	1.00	1.00	5.44	1.00	0.00	0.00	0.00	1.33
time (sec)	N/A	0.016	0.004	0.016	0.062	0.000	0.000	0.000	3.478

Problem 183	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	24	44	51	47	49	0	-1
N.S.	1	1.00	0.34	0.62	0.72	0.66	0.69	0.00	-0.01
time (sec)	N/A	0.052	0.004	0.017	0.279	0.366	73.659	0.000	0.000

Problem 184	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	25	30	34	33	49	0	-1
N.S.	1	1.00	0.56	0.67	0.76	0.73	1.09	0.00	-0.02
time (sec)	N/A	0.035	0.005	0.036	0.279	0.515	104.088	0.000	0.000

Problem 185	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	21	20	24	39	20	20
N.S.	1	1.00	1.00	1.05	1.00	1.20	1.95	1.00	1.00
time (sec)	N/A	0.016	0.004	0.031	0.286	0.440	19.909	2.632	3.504

Problem 186	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	19	15	15	0	0	-1
N.S.	1	1.00	1.00	1.27	1.00	1.00	0.00	0.00	-0.07
time (sec)	N/A	0.016	0.002	0.000	0.328	0.647	0.000	0.000	0.000

Problem 187	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	20	43	20	43	0	0	-1
N.S.	1	1.00	0.53	1.13	0.53	1.13	0.00	0.00	-0.03
time (sec)	N/A	0.033	0.004	0.074	0.319	0.374	0.000	0.000	0.000

Problem 188	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	25	70	25	61	0	0	-1
N.S.	1	1.00	0.35	0.99	0.35	0.86	0.00	0.00	-0.01
time (sec)	N/A	0.051	0.004	0.084	0.326	0.405	0.000	0.000	0.000

Problem 189	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	39	82	33	82	56	0	-1
N.S.	1	1.00	0.38	0.79	0.32	0.79	0.54	0.00	-0.01
time (sec)	N/A	0.079	0.008	0.069	0.325	0.405	72.968	0.000	0.000

Problem 190	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	39	67	33	64	56	0	-1
N.S.	1	1.00	0.53	0.91	0.45	0.86	0.76	0.00	-0.01
time (sec)	N/A	0.046	0.008	0.038	0.325	0.410	65.131	0.000	0.000

Problem 191	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	32	38	42	53	33	-1
N.S.	1	1.00	1.00	0.74	0.88	0.98	1.23	0.77	-0.02
time (sec)	N/A	0.027	0.007	0.044	0.332	0.390	85.973	6.063	0.000

Problem 192	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	39	59	35	83	0	0	-1
N.S.	1	1.00	0.59	0.89	0.53	1.26	0.00	0.00	-0.02
time (sec)	N/A	0.045	0.006	0.049	0.329	0.413	0.000	0.000	0.000

Problem 193	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	39	79	35	0	56	0	-1
N.S.	1	1.00	0.41	0.82	0.36	0.00	0.58	0.00	-0.01
time (sec)	N/A	0.066	0.007	0.059	0.332	0.000	66.730	0.000	0.000

Problem 194	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	11	15	9	0	10	10	9
N.S.	1	1.00	0.69	0.94	0.56	0.00	0.62	0.62	0.56
time (sec)	N/A	0.006	0.005	0.012	0.279	0.000	0.025	3.029	0.029

Problem 195	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	203	203	96	249	264	113	0	136	171
N.S.	1	1.00	0.47	1.23	1.30	0.56	0.00	0.67	0.84
time (sec)	N/A	0.131	0.188	0.066	0.395	0.361	0.000	3.516	3.558

Problem 196	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	140	140	83	168	218	95	0	107	121
N.S.	1	1.00	0.59	1.20	1.56	0.68	0.00	0.76	0.86
time (sec)	N/A	0.093	0.147	0.027	0.381	0.370	0.000	2.153	3.612

Problem 197	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	63	80	131	72	0	77	66
N.S.	1	1.00	0.93	1.18	1.93	1.06	0.00	1.13	0.97
time (sec)	N/A	0.035	0.053	0.038	0.362	0.389	0.000	2.895	3.482

Problem 198	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	41	41	40	45	0	33	45
N.S.	1	1.00	1.00	1.00	0.98	1.10	0.00	0.80	1.10
time (sec)	N/A	0.006	0.028	0.024	0.291	0.354	0.000	3.034	0.044

Problem 199	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.011	0.129	0.005	0.000	0.000	0.000	0.000	0.000

Problem 200	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	78	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.032	0.479	0.007	0.000	0.000	0.000	0.000	0.000

Problem 201	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	137	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.071	0.394	0.013	0.000	0.000	0.000	0.000	0.000

Problem 202	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	120	120	111	0	0	155	0	0	-1
N.S.	1	1.00	0.92	0.00	0.00	1.29	0.00	0.00	-0.01
time (sec)	N/A	0.063	0.420	0.007	0.000	0.091	0.000	0.000	0.000

Problem 203	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	86	0	0	114	0	0	-1
N.S.	1	1.00	0.93	0.00	0.00	1.24	0.00	0.00	-0.01
time (sec)	N/A	0.034	0.315	0.006	0.000	0.092	0.000	0.000	0.000

Problem 204	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	44	0	0	60	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	1.36	0.00	0.00	-0.02
time (sec)	N/A	0.004	0.056	0.005	0.000	0.091	0.000	0.000	0.000

Problem 205	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.011	0.497	0.005	0.000	0.000	0.000	0.000	0.000

Problem 206	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	133	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.211	1.655	0.011	0.000	0.000	0.000	0.000	0.000

Problem 207	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	263	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.327	1.173	0.008	0.000	0.000	0.000	0.000	0.000

Problem 208	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	164	0	0	158	0	0	-1
N.S.	1	1.00	0.90	0.00	0.00	0.86	0.00	0.00	-0.01
time (sec)	N/A	0.129	0.407	0.015	0.000	0.085	0.000	0.000	0.000

Problem 209	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	138	138	138	0	0	141	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	1.02	0.00	0.00	-0.01
time (sec)	N/A	0.107	0.370	0.010	0.000	0.082	0.000	0.000	0.000

Problem 210	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	99	99	89	0	0	124	0	0	-1
N.S.	1	1.00	0.90	0.00	0.00	1.25	0.00	0.00	-0.01
time (sec)	N/A	0.082	0.336	0.007	0.000	0.086	0.000	0.000	0.000

Problem 211	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	74	0	0	89	0	0	-1
N.S.	1	1.00	0.92	0.00	0.00	1.11	0.00	0.00	-0.01
time (sec)	N/A	0.047	0.287	0.008	0.000	0.088	0.000	0.000	0.000

Problem 212	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	38	0	0	44	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	1.16	0.00	0.00	-0.03
time (sec)	N/A	0.007	0.039	0.006	0.000	0.113	0.000	0.000	0.000

Problem 213	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	36	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.065	0.421	0.004	0.000	0.000	0.000	0.000	0.000

Problem 214	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	36	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.063	0.137	0.011	0.000	0.000	0.000	0.000	0.000

Problem 215	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	26	29	19	19	34	19	19
N.S.	1	1.00	0.65	0.72	0.48	0.48	0.85	0.48	0.48
time (sec)	N/A	0.008	0.017	0.025	0.276	0.422	0.067	2.369	0.094

Problem 216	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	291	291	241	517	0	243	0	0	-1
N.S.	1	1.00	0.83	1.78	0.00	0.84	0.00	0.00	-0.00
time (sec)	N/A	0.215	0.147	0.095	0.000	0.094	0.000	0.000	0.000

Problem 217	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	269	269	179	359	0	171	0	0	-1
N.S.	1	1.00	0.67	1.33	0.00	0.64	0.00	0.00	-0.00
time (sec)	N/A	0.189	0.116	0.072	0.000	0.085	0.000	0.000	0.000

Problem 218	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	229	229	128	227	0	114	0	0	209
N.S.	1	1.00	0.56	0.99	0.00	0.50	0.00	0.00	0.91
time (sec)	N/A	0.158	0.085	0.076	0.000	0.381	0.000	0.000	3.927

Problem 219	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	120	120	82	126	0	71	0	0	136
N.S.	1	1.00	0.68	1.05	0.00	0.59	0.00	0.00	1.13
time (sec)	N/A	0.080	0.052	0.083	0.000	0.399	0.000	0.000	3.647

Problem 220	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	41	52	0	40	0	0	50
N.S.	1	1.00	1.00	1.27	0.00	0.98	0.00	0.00	1.22
time (sec)	N/A	0.021	0.013	0.067	0.000	0.360	0.000	0.000	3.549

Problem 221	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	41	47	0	41	0	0	-1
N.S.	1	1.00	1.00	1.15	0.00	1.00	0.00	0.00	-0.02
time (sec)	N/A	0.098	0.023	0.093	0.000	0.348	0.000	0.000	0.000

Problem 222	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	68	80	0	60	0	0	-1
N.S.	1	1.00	1.00	1.18	0.00	0.88	0.00	0.00	-0.01
time (sec)	N/A	0.275	0.063	0.076	0.000	0.350	0.000	0.000	0.000

Problem 223	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	166	166	115	226	0	110	0	0	-1
N.S.	1	1.00	0.69	1.36	0.00	0.66	0.00	0.00	-0.01
time (sec)	N/A	0.500	0.100	0.068	0.000	0.350	0.000	0.000	0.000

Problem 224	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	415	415	195	343	0	201	0	0	-1
N.S.	1	1.00	0.47	0.83	0.00	0.48	0.00	0.00	-0.00
time (sec)	N/A	0.316	0.158	0.055	0.000	0.396	0.000	0.000	0.000

Problem 225	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	291	291	148	228	0	156	0	0	-1
N.S.	1	1.00	0.51	0.78	0.00	0.54	0.00	0.00	-0.00
time (sec)	N/A	0.219	0.108	0.043	0.000	0.369	0.000	0.000	0.000

Problem 226	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	206	206	131	175	0	128	0	0	-1
N.S.	1	1.00	0.64	0.85	0.00	0.62	0.00	0.00	-0.00
time (sec)	N/A	0.153	0.084	0.033	0.000	0.365	0.000	0.000	0.000

Problem 227	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	89	93	0	107	0	0	-1
N.S.	1	1.00	0.80	0.84	0.00	0.96	0.00	0.00	-0.01
time (sec)	N/A	0.081	0.040	0.046	0.000	0.401	0.000	0.000	0.000

Problem 228	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	62	65	0	68	0	0	53
N.S.	1	1.00	1.00	1.05	0.00	1.10	0.00	0.00	0.85
time (sec)	N/A	0.028	0.018	0.023	0.000	0.415	0.000	0.000	3.640

Problem 229	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.012	0.054	0.006	0.000	0.000	0.000	0.000	0.000

Problem 230	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.030	0.180	0.009	0.000	0.000	0.000	0.000	0.000

Problem 231	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.027	0.205	0.009	0.000	0.000	0.000	0.000	0.000

Problem 232	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	239	239	219	0	0	248	0	0	-1
N.S.	1	1.00	0.92	0.00	0.00	1.04	0.00	0.00	-0.00
time (sec)	N/A	0.139	0.129	0.010	0.000	0.091	0.000	0.000	0.000

Problem 233	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	184	184	167	0	0	221	0	0	-1
N.S.	1	1.00	0.91	0.00	0.00	1.20	0.00	0.00	-0.01
time (sec)	N/A	0.108	0.250	0.009	0.000	0.108	0.000	0.000	0.000

Problem 234	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	142	142	127	0	0	194	0	0	-1
N.S.	1	1.00	0.89	0.00	0.00	1.37	0.00	0.00	-0.01
time (sec)	N/A	0.083	0.045	0.008	0.000	0.105	0.000	0.000	0.000

Problem 235	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	86	0	0	154	0	0	-1
N.S.	1	1.00	0.93	0.00	0.00	1.67	0.00	0.00	-0.01
time (sec)	N/A	0.037	0.046	0.007	0.000	0.104	0.000	0.000	0.000

Problem 236	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	44	0	0	94	0	0	68
N.S.	1	1.00	1.00	0.00	0.00	2.14	0.00	0.00	1.55
time (sec)	N/A	0.004	0.007	0.006	0.000	0.098	0.000	0.000	3.970

Problem 237	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.012	0.047	0.005	0.000	0.000	0.000	0.000	0.000

Problem 238	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.032	0.176	0.010	0.000	0.000	0.000	0.000	0.000

Problem 239	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.029	0.027	0.011	0.000	0.000	0.000	0.000	0.000

Problem 240	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.035	0.194	0.013	0.000	0.000	0.000	0.000	0.000

Problem 241	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.038	0.123	0.013	0.000	0.000	0.000	0.000	0.000

Problem 242	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	36	117	36	39	0	0	41
N.S.	1	1.00	0.88	2.85	0.88	0.95	0.00	0.00	1.00
time (sec)	N/A	0.015	0.019	0.029	0.065	0.085	0.000	0.000	3.504

Problem 243	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.028	0.032	0.014	0.000	0.000	0.000	0.000	0.000

Problem 244	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.033	0.063	0.018	0.000	0.000	0.000	0.000	0.000

Problem 245	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.031	0.059	0.022	0.000	0.000	0.000	0.000	0.000

Problem 246	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.038	0.039	0.006	0.000	0.000	0.000	0.000	0.000

Problem 247	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	207	207	183	0	0	0	0	0	-1
N.S.	1	1.00	0.88	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.111	0.105	0.004	0.000	0.000	0.000	0.000	0.000

Problem 248	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	154	154	136	0	0	0	0	0	-1
N.S.	1	1.00	0.88	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.077	0.049	0.020	0.000	0.000	0.000	0.000	0.000

Problem 249	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	99	99	91	0	0	0	0	0	-1
N.S.	1	1.00	0.92	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.039	0.024	0.014	0.000	0.000	0.000	0.000	0.000

Problem 250	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	47	0	0	0	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.004	0.006	0.009	0.000	0.000	0.000	0.000	0.000

Problem 251	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.014	0.027	0.007	0.000	0.000	0.000	0.000	0.000

Problem 252	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.034	0.024	0.022	0.000	0.000	0.000	0.000	0.000

Problem 253	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.032	0.027	0.003	0.000	0.000	0.000	0.000	0.000

Problem 254	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	61	0	0	59	0	0	75
N.S.	1	1.00	1.00	0.00	0.00	0.97	0.00	0.00	1.23
time (sec)	N/A	0.042	0.131	0.021	0.000	0.095	0.000	0.000	3.805

Problem 255	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	C	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	31	579	5261	468	794	145	553
N.S.	1	1.00	0.30	5.51	50.10	4.46	7.56	1.38	5.27
time (sec)	N/A	0.092	0.365	0.108	1.755	0.396	0.312	2.686	4.149

Problem 256	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	C	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	31	396	3727	324	556	124	391
N.S.	1	1.00	0.35	4.50	42.35	3.68	6.32	1.41	4.44
time (sec)	N/A	0.078	0.238	0.092	1.322	0.382	0.202	2.602	3.937

Problem 257	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	C	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	72	249	2452	208	364	103	253
N.S.	1	1.00	0.57	1.98	19.46	1.65	2.89	0.82	2.01
time (sec)	N/A	0.177	0.206	0.092	0.986	0.380	0.142	2.636	3.825

Problem 258	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	91	91	56	138	1438	120	212	82	142
N.S.	1	1.00	0.62	1.52	15.80	1.32	2.33	0.90	1.56
time (sec)	N/A	0.127	0.179	0.086	0.736	0.381	0.169	2.943	3.661

Problem 259	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	B	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	40	63	683	60	99	1227	67
N.S.	1	1.00	0.65	1.02	11.02	0.97	1.60	19.79	1.08
time (sec)	N/A	0.072	0.155	0.079	0.522	0.361	0.074	3.191	3.546

Problem 260	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	26	25	35	34	35	25
N.S.	1	1.00	1.00	0.96	0.93	1.30	1.26	1.30	0.93
time (sec)	N/A	0.024	0.021	0.013	0.283	0.375	0.050	2.487	3.521

Problem 261	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	23	0	32	0	0	20
N.S.	1	1.00	1.00	1.05	0.00	1.45	0.00	0.00	0.91
time (sec)	N/A	0.044	0.174	0.068	0.000	0.363	0.000	0.000	3.678

Problem 262	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	47	53	0	100	0	0	51
N.S.	1	1.00	0.89	1.00	0.00	1.89	0.00	0.00	0.96
time (sec)	N/A	0.086	0.191	0.074	0.000	0.394	0.000	0.000	4.682

Problem 263	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	64	86	0	183	0	0	76
N.S.	1	1.00	0.74	0.99	0.00	2.10	0.00	0.00	0.87
time (sec)	N/A	0.131	0.208	0.076	0.000	0.386	0.000	0.000	5.757

Problem 264	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	79	119	0	292	0	0	104
N.S.	1	1.00	0.65	0.98	0.00	2.41	0.00	0.00	0.86
time (sec)	N/A	0.180	0.224	0.078	0.000	0.391	0.000	0.000	3.817

Problem 265	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	152	0	430	0	0	120
N.S.	1	1.00	1.00	4.90	0.00	13.87	0.00	0.00	3.87
time (sec)	N/A	0.043	0.174	0.108	0.000	0.084	0.000	0.000	3.814

Problem 266	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	185	0	596	0	0	136
N.S.	1	1.00	1.00	5.97	0.00	19.23	0.00	0.00	4.39
time (sec)	N/A	0.043	0.186	0.121	0.000	0.105	0.000	0.000	3.905

Problem 267	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F(-2)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	1896	6135	617	0	195	209
N.S.	1	1.00	1.00	38.69	125.20	12.59	0.00	3.98	4.27
time (sec)	N/A	0.045	0.672	0.339	1.613	0.091	0.000	1.447	4.024

Problem 268	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	1359	4471	456	0	174	730
N.S.	1	1.00	1.00	27.73	91.24	9.31	0.00	3.55	14.90
time (sec)	N/A	0.047	0.445	0.198	1.188	0.087	0.000	1.778	4.130

Problem 269	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	179	179	153	914	3066	323	0	153	533
N.S.	1	1.00	0.85	5.11	17.13	1.80	0.00	0.85	2.98
time (sec)	N/A	0.235	0.567	0.151	1.132	0.372	0.000	2.456	3.911

Problem 270	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	145	145	126	561	1922	218	0	132	378
N.S.	1	1.00	0.87	3.87	13.26	1.50	0.00	0.91	2.61
time (sec)	N/A	0.163	0.296	0.105	0.867	0.349	0.000	2.816	3.772

Problem 271	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	90	300	1037	141	0	111	243
N.S.	1	1.00	0.81	2.70	9.34	1.27	0.00	1.00	2.19
time (sec)	N/A	0.109	0.237	0.117	0.626	0.379	0.000	3.153	3.596

Problem 272	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	77	131	413	88	0	91	130
N.S.	1	1.00	1.00	1.70	5.36	1.14	0.00	1.18	1.69
time (sec)	N/A	0.060	0.176	0.087	0.427	0.355	0.000	2.337	3.588

Problem 273	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	44	58	58	48	0	36	48
N.S.	1	1.00	1.00	1.32	1.32	1.09	0.00	0.82	1.09
time (sec)	N/A	0.009	0.055	0.023	0.282	0.393	0.000	2.692	0.040

Problem 274	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	63	62	0	83	0	0	86
N.S.	1	1.00	0.94	0.93	0.00	1.24	0.00	0.00	1.28
time (sec)	N/A	0.056	0.227	0.089	0.000	0.369	0.000	0.000	4.055

Problem 275	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	81	96	0	163	0	0	201
N.S.	1	1.00	0.79	0.94	0.00	1.60	0.00	0.00	1.97
time (sec)	N/A	0.103	0.287	0.078	0.000	0.411	0.000	0.000	5.027

Problem 276	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	97	129	0	288	0	0	168
N.S.	1	1.00	0.71	0.95	0.00	2.12	0.00	0.00	1.24
time (sec)	N/A	0.150	0.315	0.080	0.000	0.378	0.000	0.000	4.868

Problem 277	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	170	170	112	162	0	429	0	0	201
N.S.	1	1.00	0.66	0.95	0.00	2.52	0.00	0.00	1.18
time (sec)	N/A	0.198	0.359	0.099	0.000	0.371	0.000	0.000	4.128

Problem 278	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	195	0	598	0	0	234
N.S.	1	1.00	1.00	3.98	0.00	12.20	0.00	0.00	4.78
time (sec)	N/A	0.045	0.303	0.108	0.000	0.367	0.000	0.000	4.086

Problem 279	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	228	0	795	0	0	267
N.S.	1	1.00	1.00	4.65	0.00	16.22	0.00	0.00	5.45
time (sec)	N/A	0.045	0.338	0.137	0.000	0.392	0.000	0.000	4.153

Problem 280	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	61	0	0	71	0	0	75
N.S.	1	1.00	1.00	0.00	0.00	1.16	0.00	0.00	1.23
time (sec)	N/A	0.045	0.138	0.022	0.000	0.104	0.000	0.000	3.678

Problem 281	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	B	B	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	31	857	1268	688	1170	0	685
N.S.	1	1.00	0.30	8.16	12.08	6.55	11.14	0.00	6.52
time (sec)	N/A	0.083	0.521	0.096	0.409	0.402	0.378	0.000	4.370

Problem 282	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	B	B	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	31	584	874	474	821	0	487
N.S.	1	1.00	0.35	6.64	9.93	5.39	9.33	0.00	5.53
time (sec)	N/A	0.082	0.487	0.079	0.386	0.368	0.294	0.000	4.078

Problem 283	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	75	365	555	302	536	1320	323
N.S.	1	1.00	0.60	2.94	4.48	2.44	4.32	10.65	2.60
time (sec)	N/A	0.198	0.402	0.066	0.392	0.377	0.201	4.601	3.871

Problem 284	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	56	200	308	172	304	705	196
N.S.	1	1.00	0.58	2.08	3.21	1.79	3.17	7.34	2.04
time (sec)	N/A	0.144	0.236	0.087	0.382	0.373	0.137	1.787	3.663

Problem 285	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	B	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	40	89	133	84	143	1014	95
N.S.	1	1.00	0.65	1.44	2.15	1.35	2.31	16.35	1.53
time (sec)	N/A	0.093	0.178	0.105	0.384	0.366	0.092	2.491	3.627

Problem 286	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	26	25	47	44	47	25
N.S.	1	1.00	1.00	0.96	0.93	1.74	1.63	1.74	0.93
time (sec)	N/A	0.046	0.025	0.090	0.286	0.355	0.062	1.972	3.533

Problem 287	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	0	0	44	0	0	20
N.S.	1	1.00	1.00	0.00	0.00	2.00	0.00	0.00	0.91
time (sec)	N/A	0.044	0.192	0.015	0.000	0.369	0.000	0.000	3.580

Problem 288	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	47	0	0	147	0	0	51
N.S.	1	1.00	0.89	0.00	0.00	2.77	0.00	0.00	0.96
time (sec)	N/A	0.088	0.194	0.021	0.000	0.353	0.000	0.000	3.921

Problem 289	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	64	0	0	269	0	0	76
N.S.	1	1.00	0.74	0.00	0.00	3.09	0.00	0.00	0.87
time (sec)	N/A	0.132	0.224	0.034	0.000	0.353	0.000	0.000	4.884

Problem 290	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-2)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	80	0	0	431	0	0	104
N.S.	1	1.00	0.66	0.00	0.00	3.56	0.00	0.00	0.86
time (sec)	N/A	0.181	0.251	0.052	0.000	0.395	0.000	0.000	3.871

Problem 291	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	0	0	636	0	0	120
N.S.	1	1.00	1.00	0.00	0.00	20.52	0.00	0.00	3.87
time (sec)	N/A	0.042	0.209	0.078	0.000	0.113	0.000	0.000	4.033

Problem 292	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	0	0	883	0	0	136
N.S.	1	1.00	1.00	0.00	0.00	28.48	0.00	0.00	4.39
time (sec)	N/A	0.042	0.232	0.107	0.000	0.092	0.000	0.000	4.303

Problem 293	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	0	0	118	0	0	112
N.S.	1	1.00	1.00	0.00	0.00	2.41	0.00	0.00	2.29
time (sec)	N/A	0.046	0.222	0.015	0.000	0.087	0.000	0.000	3.918

Problem 294	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	0	0	63	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	1.29	0.00	0.00	-0.02
time (sec)	N/A	0.026	0.158	0.007	0.000	0.101	0.000	0.000	0.000

Problem 295	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	47	0	0	63	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	1.34	0.00	0.00	-0.02
time (sec)	N/A	0.005	0.092	0.005	0.000	0.108	0.000	0.000	0.000

Problem 296	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	0	0	110	0	0	74
N.S.	1	1.00	1.00	0.00	0.00	2.24	0.00	0.00	1.51
time (sec)	N/A	0.042	0.326	0.015	0.000	0.102	0.000	0.000	3.730

Problem 297	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	0	0	135	0	0	87
N.S.	1	1.00	1.00	0.00	0.00	2.76	0.00	0.00	1.78
time (sec)	N/A	0.042	0.348	0.017	0.000	0.087	0.000	0.000	3.829

Problem 298	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	0	0	226	0	0	130
N.S.	1	1.00	1.00	0.00	0.00	4.61	0.00	0.00	2.65
time (sec)	N/A	0.040	0.391	0.022	0.000	0.109	0.000	0.000	4.466

Problem 299	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	A	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	42	0	43	42	80	781	38
N.S.	1	1.00	0.66	0.00	0.67	0.66	1.25	12.20	0.59
time (sec)	N/A	0.025	0.040	0.009	0.280	0.365	0.261	4.979	3.596

Problem 300	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	60	0	62	58	0	1338	54
N.S.	1	1.00	0.60	0.00	0.62	0.58	0.00	13.38	0.54
time (sec)	N/A	0.045	0.033	0.002	0.278	0.411	0.000	3.876	3.577

Problem 301	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	50	0	0	0	0	0	73
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.46
time (sec)	N/A	0.033	0.015	0.020	0.000	0.000	0.000	0.000	3.668

Problem 302	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	29	534	0	244	0	0	181
N.S.	1	1.00	1.00	18.41	0.00	8.41	0.00	0.00	6.24
time (sec)	N/A	0.032	0.006	0.121	0.000	0.084	0.000	0.000	3.672

Problem 303	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	368	0	175	0	0	148
N.S.	1	1.00	1.00	13.14	0.00	6.25	0.00	0.00	5.29
time (sec)	N/A	0.030	0.006	0.120	0.000	0.094	0.000	0.000	3.705

Problem 304	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	119	119	76	234	0	120	0	0	89
N.S.	1	1.00	0.64	1.97	0.00	1.01	0.00	0.00	0.75
time (sec)	N/A	0.094	0.052	0.096	0.000	0.356	0.000	0.000	3.880

Problem 305	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	58	133	0	77	0	0	82
N.S.	1	1.00	0.68	1.56	0.00	0.91	0.00	0.00	0.96
time (sec)	N/A	0.056	0.037	0.071	0.000	0.382	0.000	0.000	6.115

Problem 306	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	42	61	0	51	0	0	47
N.S.	1	1.00	0.91	1.33	0.00	1.11	0.00	0.00	1.02
time (sec)	N/A	0.035	0.020	0.076	0.000	0.355	0.000	0.000	4.401

Problem 307	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	22	0	20	0	0	20
N.S.	1	1.00	1.00	1.10	0.00	1.00	0.00	0.00	1.00
time (sec)	N/A	0.030	0.005	0.092	0.000	0.359	0.000	0.000	3.757

Problem 308	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	25	26	25	31	34	31	25
N.S.	1	1.00	1.00	1.04	1.00	1.24	1.36	1.24	1.00
time (sec)	N/A	0.028	0.006	0.062	0.276	0.391	0.117	2.753	5.042

Problem 309	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	41	51	0	51	44	0	41
N.S.	1	1.00	0.72	0.89	0.00	0.89	0.77	0.00	0.72
time (sec)	N/A	0.058	0.014	0.065	0.000	0.382	0.083	0.000	6.233

Problem 310	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	60	79	0	95	102	0	104
N.S.	1	1.00	0.67	0.88	0.00	1.06	1.13	0.00	1.16
time (sec)	N/A	0.089	0.019	0.067	0.000	0.389	0.103	0.000	5.622

Problem 311	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	76	125	0	150	177	0	161
N.S.	1	1.00	0.62	1.02	0.00	1.23	1.45	0.00	1.32
time (sec)	N/A	0.128	0.026	0.068	0.000	0.379	0.122	0.000	3.801

Problem 312	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	B	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	29	189	0	219	272	0	231
N.S.	1	1.00	0.32	2.05	0.00	2.38	2.96	0.00	2.51
time (sec)	N/A	0.058	0.006	0.075	0.000	0.354	0.145	0.000	3.880

Problem 313	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	B	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	108	108	28	271	0	302	388	0	315
N.S.	1	1.00	0.26	2.51	0.00	2.80	3.59	0.00	2.92
time (sec)	N/A	0.053	0.006	0.079	0.000	0.391	0.176	0.000	3.942

Problem 314	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	61	0	0	0	0	0	73
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.20
time (sec)	N/A	0.033	0.027	0.024	0.000	0.000	0.000	0.000	3.758

Problem 315	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	961	0	465	0	0	136
N.S.	1	1.00	1.00	31.00	0.00	15.00	0.00	0.00	4.39
time (sec)	N/A	0.032	0.007	0.100	0.000	0.105	0.000	0.000	3.955

Problem 316	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	646	0	331	0	0	120
N.S.	1	1.00	1.00	20.84	0.00	10.68	0.00	0.00	3.87
time (sec)	N/A	0.032	0.007	0.084	0.000	0.124	0.000	0.000	3.845

Problem 317	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	96	395	0	225	0	0	92
N.S.	1	1.00	0.79	3.26	0.00	1.86	0.00	0.00	0.76
time (sec)	N/A	0.117	0.111	0.082	0.000	0.389	0.000	0.000	3.777

Problem 318	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	71	208	0	145	0	0	76
N.S.	1	1.00	0.82	2.39	0.00	1.67	0.00	0.00	0.87
time (sec)	N/A	0.084	0.031	0.101	0.000	0.440	0.000	0.000	3.700

Problem 319	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	47	86	0	96	0	0	51
N.S.	1	1.00	0.89	1.62	0.00	1.81	0.00	0.00	0.96
time (sec)	N/A	0.050	0.017	0.026	0.000	0.429	0.000	0.000	5.449

Problem 320	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	23	0	31	0	0	20
N.S.	1	1.00	1.00	1.05	0.00	1.41	0.00	0.00	0.91
time (sec)	N/A	0.030	0.006	0.070	0.000	0.361	0.000	0.000	3.699

Problem 321	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	26	25	54	53	54	37
N.S.	1	1.00	1.00	0.96	0.93	2.00	1.96	2.00	1.37
time (sec)	N/A	0.028	0.008	0.063	0.286	0.384	0.133	1.948	3.542

Problem 322	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	47	74	101	100	82	0	97
N.S.	1	1.00	0.76	1.19	1.63	1.61	1.32	0.00	1.56
time (sec)	N/A	0.059	0.019	0.064	0.285	0.366	0.119	0.000	3.715

Problem 323	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	B	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	91	91	64	127	208	180	189	1703	183
N.S.	1	1.00	0.70	1.40	2.29	1.98	2.08	18.71	2.01
time (sec)	N/A	0.090	0.025	0.066	0.292	0.367	0.160	2.724	3.957

Problem 324	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	81	216	349	287	333	0	292
N.S.	1	1.00	0.64	1.71	2.77	2.28	2.64	0.00	2.32
time (sec)	N/A	0.127	0.032	0.087	0.301	0.362	0.207	0.000	4.249

Problem 325	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	B	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	31	341	526	420	518	0	427
N.S.	1	1.00	0.32	3.55	5.48	4.38	5.40	0.00	4.45
time (sec)	N/A	0.051	0.006	0.117	0.302	0.397	0.335	0.000	4.573

Problem 326	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	B	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	113	113	31	502	740	583	745	0	583
N.S.	1	1.00	0.27	4.44	6.55	5.16	6.59	0.00	5.16
time (sec)	N/A	0.060	0.006	0.147	0.310	0.380	1.505	0.000	4.987

Problem 327	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	1173	0	561	0	0	265
N.S.	1	1.00	1.00	23.94	0.00	11.45	0.00	0.00	5.41
time (sec)	N/A	0.033	0.022	0.128	0.000	0.375	0.000	0.000	4.345

Problem 328	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	826	0	413	0	0	232
N.S.	1	1.00	1.00	16.86	0.00	8.43	0.00	0.00	4.73
time (sec)	N/A	0.033	0.020	0.101	0.000	0.389	0.000	0.000	4.171

Problem 329	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	170	170	113	543	0	293	0	0	199
N.S.	1	1.00	0.66	3.19	0.00	1.72	0.00	0.00	1.17
time (sec)	N/A	0.171	0.090	0.096	0.000	0.365	0.000	0.000	4.408

Problem 330	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	97	324	0	201	0	0	166
N.S.	1	1.00	0.71	2.38	0.00	1.48	0.00	0.00	1.22
time (sec)	N/A	0.121	0.068	0.082	0.000	0.359	0.000	0.000	4.014

Problem 331	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	79	169	0	130	0	0	97
N.S.	1	1.00	0.77	1.66	0.00	1.27	0.00	0.00	0.95
time (sec)	N/A	0.081	0.055	0.081	0.000	0.396	0.000	0.000	4.003

Problem 332	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	63	74	0	91	0	0	62
N.S.	1	1.00	0.94	1.10	0.00	1.36	0.00	0.00	0.93
time (sec)	N/A	0.046	0.027	0.025	0.000	0.373	0.000	0.000	4.769

Problem 333	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	46	35	0	45	0	0	35
N.S.	1	1.00	1.00	0.76	0.00	0.98	0.00	0.00	0.76
time (sec)	N/A	0.038	0.008	0.071	0.000	0.362	0.000	0.000	3.504

Problem 334	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	81	76	0	117	0	0	76
N.S.	1	1.00	1.00	0.94	0.00	1.44	0.00	0.00	0.94
time (sec)	N/A	0.071	0.034	0.074	0.000	0.383	0.000	0.000	3.984

Problem 335	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	95	109	0	199	0	0	105
N.S.	1	1.00	0.83	0.95	0.00	1.73	0.00	0.00	0.91
time (sec)	N/A	0.105	0.066	0.083	0.000	0.384	0.000	0.000	3.899

Problem 336	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	149	149	111	142	0	305	0	0	142
N.S.	1	1.00	0.74	0.95	0.00	2.05	0.00	0.00	0.95
time (sec)	N/A	0.141	0.090	0.093	0.000	0.391	0.000	0.000	4.373

Problem 337	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	127	175	0	439	0	0	160
N.S.	1	1.00	0.69	0.96	0.00	2.40	0.00	0.00	0.87
time (sec)	N/A	0.181	0.107	0.125	0.000	0.396	0.000	0.000	4.623

Problem 338	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	208	0	601	0	0	189
N.S.	1	1.00	1.00	4.24	0.00	12.27	0.00	0.00	3.86
time (sec)	N/A	0.030	0.028	0.182	0.000	0.122	0.000	0.000	4.918

Problem 339	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	241	0	791	0	0	217
N.S.	1	1.00	1.00	4.92	0.00	16.14	0.00	0.00	4.43
time (sec)	N/A	0.030	0.020	0.210	0.000	0.141	0.000	0.000	5.078

Problem 340	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	61	0	0	0	0	0	73
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.20
time (sec)	N/A	0.032	0.028	0.026	0.000	0.000	0.000	0.000	3.724

Problem 341	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	0	0	686	0	0	136
N.S.	1	1.00	1.00	0.00	0.00	22.13	0.00	0.00	4.39
time (sec)	N/A	0.032	0.008	0.034	0.000	0.112	0.000	0.000	4.017

Problem 342	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	0	0	487	0	0	120
N.S.	1	1.00	1.00	0.00	0.00	15.71	0.00	0.00	3.87
time (sec)	N/A	0.031	0.008	0.027	0.000	0.125	0.000	0.000	3.829

Problem 343	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	96	0	0	330	0	0	92
N.S.	1	1.00	0.79	0.00	0.00	2.73	0.00	0.00	0.76
time (sec)	N/A	0.130	0.137	0.022	0.000	0.374	0.000	0.000	3.873

Problem 344	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	71	0	0	213	0	0	76
N.S.	1	1.00	0.82	0.00	0.00	2.45	0.00	0.00	0.87
time (sec)	N/A	0.098	0.041	0.018	0.000	0.423	0.000	0.000	3.594

Problem 345	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	47	0	0	141	0	0	51
N.S.	1	1.00	0.89	0.00	0.00	2.66	0.00	0.00	0.96
time (sec)	N/A	0.064	0.025	0.014	0.000	0.357	0.000	0.000	3.724

Problem 346	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	0	0	42	0	0	20
N.S.	1	1.00	1.00	0.00	0.00	1.91	0.00	0.00	0.91
time (sec)	N/A	0.030	0.006	0.015	0.000	0.387	0.000	0.000	3.721

Problem 347	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	26	25	77	65	77	48
N.S.	1	1.00	1.00	0.96	0.93	2.85	2.41	2.85	1.78
time (sec)	N/A	0.029	0.010	0.057	0.279	0.339	0.168	2.218	3.636

Problem 348	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	47	97	144	148	114	0	136
N.S.	1	1.00	0.76	1.56	2.32	2.39	1.84	0.00	2.19
time (sec)	N/A	0.059	0.021	0.068	0.282	0.364	0.146	0.000	3.887

Problem 349	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	64	175	300	265	270	0	263
N.S.	1	1.00	0.67	1.82	3.12	2.76	2.81	0.00	2.74
time (sec)	N/A	0.094	0.032	0.100	0.291	0.392	0.221	0.000	4.083

Problem 350	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	123	123	73	307	507	423	484	0	422
N.S.	1	1.00	0.59	2.50	4.12	3.44	3.93	0.00	3.43
time (sec)	N/A	0.128	0.024	0.143	0.301	0.404	0.404	0.000	4.585

Problem 351	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	B	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	31	493	770	621	760	0	620
N.S.	1	1.00	0.32	5.14	8.02	6.47	7.92	0.00	6.46
time (sec)	N/A	0.059	0.007	0.221	0.309	0.420	3.781	0.000	5.155

Problem 352	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	B	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	113	113	31	733	1085	863	1096	0	854
N.S.	1	1.00	0.27	6.49	9.60	7.64	9.70	0.00	7.56
time (sec)	N/A	0.069	0.007	0.112	0.318	0.445	50.035	0.000	5.772

Problem 353	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	0	0	178	0	0	128
N.S.	1	1.00	1.00	0.00	0.00	3.63	0.00	0.00	2.61
time (sec)	N/A	0.033	0.021	0.015	0.000	0.095	0.000	0.000	3.924

Problem 354	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	0	0	142	0	0	107
N.S.	1	1.00	1.00	0.00	0.00	2.90	0.00	0.00	2.18
time (sec)	N/A	0.019	0.017	0.007	0.000	0.090	0.000	0.000	4.993

Problem 355	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	47	0	0	129	0	0	71
N.S.	1	1.00	1.00	0.00	0.00	2.74	0.00	0.00	1.51
time (sec)	N/A	0.005	0.010	0.005	0.000	0.089	0.000	0.000	3.935

Problem 356	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	0	0	59	0	0	58
N.S.	1	1.00	1.00	0.00	0.00	1.20	0.00	0.00	1.18
time (sec)	N/A	0.032	0.021	0.017	0.000	0.087	0.000	0.000	3.554

Problem 357	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	0	0	58	0	0	48
N.S.	1	1.00	1.00	0.00	0.00	1.18	0.00	0.00	0.98
time (sec)	N/A	0.032	0.020	0.020	0.000	0.097	0.000	0.000	3.778

Problem 358	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	0	0	155	0	0	114
N.S.	1	1.00	1.00	0.00	0.00	3.16	0.00	0.00	2.33
time (sec)	N/A	0.032	0.025	0.029	0.000	0.096	0.000	0.000	4.134

Problem 359	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	61	0	0	0	0	0	93
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.52
time (sec)	N/A	0.025	0.016	0.030	0.000	0.000	0.000	0.000	3.984

Problem 360	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	54	0	0	0	0	0	73
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.35
time (sec)	N/A	0.025	0.012	0.009	0.000	0.000	0.000	0.000	3.857

Problem 361	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	54	0	0	0	0	0	73
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.35
time (sec)	N/A	0.024	0.011	0.024	0.000	0.000	0.000	0.000	3.897

Problem 362	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	54	0	0	0	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.014	0.010	0.014	0.000	0.000	0.000	0.000	0.000

Problem 363	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	50	0	0	0	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.005	0.008	0.010	0.000	0.000	0.000	0.000	0.000

Problem 364	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	26	0	22	0	0	-1
N.S.	1	1.00	1.00	1.18	0.00	1.00	0.00	0.00	-0.05
time (sec)	N/A	0.033	0.004	0.114	0.000	0.349	0.000	0.000	0.000

Problem 365	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	52	0	0	0	0	0	71
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.37
time (sec)	N/A	0.023	0.010	0.033	0.000	0.000	0.000	0.000	3.703

Problem 366	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	54	0	0	0	0	0	67
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.24
time (sec)	N/A	0.023	0.009	0.009	0.000	0.000	0.000	0.000	3.716

Problem 367	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	54	0	0	0	0	0	71
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.31
time (sec)	N/A	0.026	0.008	0.010	0.000	0.000	0.000	0.000	3.619

Problem 368	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	114	114	32	113	129	116	0	0	-1
N.S.	1	1.00	0.28	0.99	1.13	1.02	0.00	0.00	-0.01
time (sec)	N/A	0.050	0.006	0.073	0.294	0.378	0.000	0.000	0.000

Problem 369	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	31	95	108	98	0	0	-1
N.S.	1	1.00	0.33	1.01	1.15	1.04	0.00	0.00	-0.01
time (sec)	N/A	0.039	0.006	0.062	0.299	0.390	0.000	0.000	0.000

Problem 370	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	137	137	32	77	87	80	0	0	-1
N.S.	1	1.00	0.23	0.56	0.64	0.58	0.00	0.00	-0.01
time (sec)	N/A	0.114	0.006	0.063	0.298	0.370	0.000	0.000	0.000

Problem 371	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	31	59	66	62	0	0	-1
N.S.	1	1.00	0.31	0.59	0.66	0.62	0.00	0.00	-0.01
time (sec)	N/A	0.080	0.006	0.065	0.289	0.365	0.000	0.000	0.000

Problem 372	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	32	41	45	44	0	0	-1
N.S.	1	1.00	0.51	0.65	0.71	0.70	0.00	0.00	-0.02
time (sec)	N/A	0.050	0.006	0.071	0.308	0.355	0.000	0.000	0.000

Problem 373	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	28	27	31	0	27	27
N.S.	1	1.00	1.00	1.04	1.00	1.15	0.00	1.00	1.00
time (sec)	N/A	0.023	0.007	0.063	0.279	0.378	0.000	3.078	3.680

Problem 374	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	26	0	22	0	0	-1
N.S.	1	1.00	1.00	1.18	0.00	1.00	0.00	0.00	-0.05
time (sec)	N/A	0.023	0.003	0.000	0.000	0.381	0.000	0.000	0.000

Problem 375	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	27	61	0	62	0	0	-1
N.S.	1	1.00	0.48	1.09	0.00	1.11	0.00	0.00	-0.02
time (sec)	N/A	0.048	0.006	0.120	0.000	0.378	0.000	0.000	0.000

Problem 376	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	32	99	0	84	0	0	-1
N.S.	1	1.00	0.32	0.99	0.00	0.84	0.00	0.00	-0.01
time (sec)	N/A	0.079	0.006	0.099	0.000	0.377	0.000	0.000	0.000

Problem 377	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	139	139	31	137	0	101	0	0	-1
N.S.	1	1.00	0.22	0.99	0.00	0.73	0.00	0.00	-0.01
time (sec)	N/A	0.110	0.006	0.104	0.000	0.386	0.000	0.000	0.000

Problem 378	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	32	175	0	119	0	0	-1
N.S.	1	1.00	1.00	5.47	0.00	3.72	0.00	0.00	-0.03
time (sec)	N/A	0.026	0.006	0.098	0.000	0.110	0.000	0.000	0.000

Problem 379	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	213	0	137	0	0	-1
N.S.	1	1.00	1.00	6.87	0.00	4.42	0.00	0.00	-0.03
time (sec)	N/A	0.027	0.006	0.114	0.000	0.096	0.000	0.000	0.000

Problem 380	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	47	36	0	50	0	37	39
N.S.	1	1.00	1.00	0.77	0.00	1.06	0.00	0.79	0.83
time (sec)	N/A	0.034	0.009	0.137	0.000	0.380	0.000	2.445	3.947

Problem 381	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	47	34	0	47	0	35	35
N.S.	1	1.00	1.00	0.72	0.00	1.00	0.00	0.74	0.74
time (sec)	N/A	0.031	0.007	0.085	0.000	0.377	0.000	2.920	4.044

Problem 382	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	518	518	412	1657	1456	525	0	942	716
N.S.	1	1.00	0.80	3.20	2.81	1.01	0.00	1.82	1.38
time (sec)	N/A	0.631	1.363	0.097	0.710	0.388	0.000	3.449	4.112

Problem 383	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	389	389	220	1063	1052	361	0	644	517
N.S.	1	1.00	0.57	2.73	2.70	0.93	0.00	1.66	1.33
time (sec)	N/A	0.454	1.224	0.094	0.596	0.410	0.000	2.754	3.682

Problem 384	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	258	258	148	617	695	208	0	426	313
N.S.	1	1.00	0.57	2.39	2.69	0.81	0.00	1.65	1.21
time (sec)	N/A	0.302	1.081	0.095	0.527	0.428	0.000	2.596	3.757

Problem 385	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	170	170	105	324	422	136	0	258	194
N.S.	1	1.00	0.62	1.91	2.48	0.80	0.00	1.52	1.14
time (sec)	N/A	0.196	0.999	0.085	0.448	0.417	0.000	2.596	3.818

Problem 386	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	74	132	195	85	0	127	96
N.S.	1	1.00	0.91	1.63	2.41	1.05	0.00	1.57	1.19
time (sec)	N/A	0.085	0.551	0.043	0.360	0.390	0.000	3.213	3.626

Problem 387	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	44	58	58	48	0	36	48
N.S.	1	1.00	1.00	1.32	1.32	1.09	0.00	0.82	1.09
time (sec)	N/A	0.009	0.007	0.013	0.285	0.373	0.000	2.180	3.402

Problem 388	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.043	0.788	0.016	0.000	0.000	0.000	0.000	0.000

Problem 389	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	109	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.104	1.580	0.016	0.000	0.000	0.000	0.000	0.000

Problem 390	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	200	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.213	1.640	0.017	0.000	0.000	0.000	0.000	0.000

Problem 391	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	177	177	167	0	0	231	0	0	-1
N.S.	1	1.00	0.94	0.00	0.00	1.31	0.00	0.00	-0.01
time (sec)	N/A	0.105	0.451	0.020	0.000	0.082	0.000	0.000	0.000

Problem 392	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	117	0	0	168	0	0	-1
N.S.	1	1.00	0.93	0.00	0.00	1.33	0.00	0.00	-0.01
time (sec)	N/A	0.073	0.361	0.017	0.000	0.093	0.000	0.000	0.000

Problem 393	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	86	0	0	105	0	0	-1
N.S.	1	1.00	0.93	0.00	0.00	1.14	0.00	0.00	-0.01
time (sec)	N/A	0.040	0.339	0.011	0.000	0.094	0.000	0.000	0.000

Problem 394	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	40	0	0	49	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	1.22	0.00	0.00	-0.02
time (sec)	N/A	0.004	0.050	0.005	0.000	0.130	0.000	0.000	0.000

Problem 395	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.015	0.553	0.015	0.000	0.000	0.000	0.000	0.000

Problem 396	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	153	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.237	2.476	0.017	0.000	0.000	0.000	0.000	0.000

Problem 397	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	66	106	0	96	0	0	-1
N.S.	1	1.00	0.93	1.49	0.00	1.35	0.00	0.00	-0.01
time (sec)	N/A	0.271	0.086	0.141	0.000	0.379	0.000	0.000	0.000

Problem 398	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	116	191	0	186	0	0	-1
N.S.	1	1.00	1.00	1.65	0.00	1.60	0.00	0.00	-0.01
time (sec)	N/A	0.674	0.193	0.108	0.000	0.363	0.000	0.000	0.000

Problem 399	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	A	F	B	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	267	267	0	506	0	556	0	0	-1
N.S.	1	1.00	0.00	1.90	0.00	2.08	0.00	0.00	-0.00
time (sec)	N/A	1.266	0.407	0.127	0.000	0.381	0.000	0.000	0.000

Problem 400	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	B	F	B	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	460	460	0	922	0	1368	0	0	-1
N.S.	1	1.00	0.00	2.00	0.00	2.97	0.00	0.00	-0.00
time (sec)	N/A	2.537	0.197	0.138	0.000	0.453	0.000	0.000	0.000

Problem 401	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	346	346	468	1146	0	626	0	1427	-1
N.S.	1	1.00	1.35	3.31	0.00	1.81	0.00	4.12	-0.00
time (sec)	N/A	0.252	0.365	0.124	0.000	0.093	0.000	1.072	0.000

Problem 402	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	320	320	292	682	0	370	0	830	-1
N.S.	1	1.00	0.91	2.13	0.00	1.16	0.00	2.59	-0.00
time (sec)	N/A	0.212	0.237	0.072	0.000	0.084	0.000	1.273	0.000

Problem 403	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	255	255	170	356	0	195	0	424	306
N.S.	1	1.00	0.67	1.40	0.00	0.76	0.00	1.66	1.20
time (sec)	N/A	0.176	0.150	0.066	0.000	0.377	0.000	2.293	4.101

Problem 404	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	91	150	0	86	0	171	153
N.S.	1	1.00	0.73	1.20	0.00	0.69	0.00	1.37	1.22
time (sec)	N/A	0.087	0.075	0.025	0.000	0.354	0.000	2.409	3.665

Problem 405	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	37	42	0	38	0	49	44
N.S.	1	1.00	1.00	1.14	0.00	1.03	0.00	1.32	1.19
time (sec)	N/A	0.020	0.012	0.009	0.000	0.346	0.000	2.466	3.622

Problem 406	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	56	79	0	73	0	492	-1
N.S.	1	1.00	0.90	1.27	0.00	1.18	0.00	7.94	-0.02
time (sec)	N/A	0.138	0.047	0.093	0.000	0.395	0.000	2.034	0.000

Problem 407	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	105	97	0	156	0	345	-1
N.S.	1	1.00	0.98	0.91	0.00	1.46	0.00	3.22	-0.01
time (sec)	N/A	0.368	0.095	0.077	0.000	0.350	0.000	2.354	0.000

Problem 408	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	A	F	B	F	B	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	240	240	0	240	0	513	0	1759	-1
N.S.	1	1.00	0.00	1.00	0.00	2.14	0.00	7.33	-0.00
time (sec)	N/A	0.710	0.250	0.076	0.000	0.383	0.000	2.562	0.000

Problem 409	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	322	322	243	560	0	309	0	0	-1
N.S.	1	1.00	0.75	1.74	0.00	0.96	0.00	0.00	-0.00
time (sec)	N/A	0.241	0.237	0.083	0.000	0.391	0.000	0.000	0.000

Problem 410	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	215	215	176	313	0	199	0	0	-1
N.S.	1	1.00	0.82	1.46	0.00	0.93	0.00	0.00	-0.00
time (sec)	N/A	0.165	0.149	0.094	0.000	0.375	0.000	0.000	0.000

Problem 411	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	85	140	0	123	0	0	-1
N.S.	1	1.00	0.77	1.26	0.00	1.11	0.00	0.00	-0.01
time (sec)	N/A	0.087	0.083	0.021	0.000	0.400	0.000	0.000	0.000

Problem 412	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	50	48	0	64	0	0	43
N.S.	1	1.00	1.00	0.96	0.00	1.28	0.00	0.00	0.86
time (sec)	N/A	0.025	0.015	0.014	0.000	0.399	0.000	0.000	3.691

Problem 413	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.016	0.028	0.032	0.000	0.000	0.000	0.000	0.000

Problem 414	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.041	0.162	0.030	0.000	0.000	0.000	0.000	0.000

Problem 415	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.038	0.057	0.046	0.000	0.000	0.000	0.000	0.000

Problem 416	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	206	206	195	0	0	357	0	0	-1
N.S.	1	1.00	0.95	0.00	0.00	1.73	0.00	0.00	-0.00
time (sec)	N/A	0.125	0.101	0.032	0.000	0.117	0.000	0.000	0.000

Problem 417	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	151	151	136	0	0	266	0	0	-1
N.S.	1	1.00	0.90	0.00	0.00	1.76	0.00	0.00	-0.01
time (sec)	N/A	0.106	0.056	0.032	0.000	0.092	0.000	0.000	0.000

Problem 418	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	85	0	0	174	0	0	-1
N.S.	1	1.00	0.92	0.00	0.00	1.89	0.00	0.00	-0.01
time (sec)	N/A	0.042	0.059	0.021	0.000	0.086	0.000	0.000	0.000

Problem 419	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	40	0	0	92	0	0	61
N.S.	1	1.00	1.00	0.00	0.00	2.30	0.00	0.00	1.52
time (sec)	N/A	0.004	0.006	0.004	0.000	0.094	0.000	0.000	3.951

Problem 420	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.016	0.024	0.030	0.000	0.000	0.000	0.000	0.000

Problem 421	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.041	0.216	0.030	0.000	0.000	0.000	0.000	0.000

Problem 422	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	103	432	0	137	0	0	-1
N.S.	1	1.00	0.99	4.15	0.00	1.32	0.00	0.00	-0.01
time (sec)	N/A	0.702	0.218	0.167	0.000	0.369	0.000	0.000	0.000

Problem 423	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	B	F	A	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	159	159	0	580	0	221	0	0	-1
N.S.	1	1.00	0.00	3.65	0.00	1.39	0.00	0.00	-0.01
time (sec)	N/A	1.654	0.569	0.126	0.000	0.396	0.000	0.000	0.000

Problem 424	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	B	F	B	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	366	366	0	2014	0	756	0	0	-1
N.S.	1	1.00	0.00	5.50	0.00	2.07	0.00	0.00	-0.00
time (sec)	N/A	3.292	0.195	0.139	0.000	0.409	0.000	0.000	0.000

Problem 425	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	B	F	B	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	634	634	0	4671	0	2251	0	0	-1
N.S.	1	1.00	0.00	7.37	0.00	3.55	0.00	0.00	-0.00
time (sec)	N/A	6.471	0.316	0.160	0.000	0.435	0.000	0.000	0.000

Problem 426	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	217	217	122	218	201	114	0	137	153
N.S.	1	1.00	0.56	1.00	0.93	0.53	0.00	0.63	0.71
time (sec)	N/A	0.164	0.239	0.054	0.370	0.397	0.000	2.631	3.870

Problem 427	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	164	164	104	163	166	95	0	108	111
N.S.	1	1.00	0.63	0.99	1.01	0.58	0.00	0.66	0.68
time (sec)	N/A	0.076	0.189	0.025	0.363	0.380	0.000	2.597	3.599

Problem 428	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	81	79	107	73	0	80	71
N.S.	1	1.00	1.00	0.98	1.32	0.90	0.00	0.99	0.88
time (sec)	N/A	0.029	0.106	0.022	0.367	0.384	0.000	2.966	3.571

Problem 429	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	56	50	50	55	0	50	49
N.S.	1	1.00	1.00	0.89	0.89	0.98	0.00	0.89	0.88
time (sec)	N/A	0.012	0.033	0.019	0.296	0.379	0.000	2.616	3.529

Problem 430	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	19	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.017	0.174	0.006	0.000	0.000	0.000	0.000	0.000

Problem 431	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	94	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.055	0.365	0.007	0.000	0.000	0.000	0.000	0.000

Problem 432	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	181	181	91	194	181	89	0	104	112
N.S.	1	1.00	0.50	1.07	1.00	0.49	0.00	0.57	0.62
time (sec)	N/A	0.124	0.294	0.040	0.359	0.362	0.000	5.525	0.301

Problem 433	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	134	79	111	151	72	0	80	80
N.S.	1	1.00	0.59	0.83	1.13	0.54	0.00	0.60	0.60
time (sec)	N/A	0.059	0.203	0.017	0.353	0.377	0.000	2.982	3.717

Problem 434	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	68	53	98	57	0	58	58
N.S.	1	1.00	1.03	0.80	1.48	0.86	0.00	0.88	0.88
time (sec)	N/A	0.025	0.111	0.021	0.338	0.371	0.000	3.188	3.475

Problem 435	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	46	34	32	36	41	38	40
N.S.	1	1.00	1.05	0.77	0.73	0.82	0.93	0.86	0.91
time (sec)	N/A	0.008	0.034	0.012	0.283	0.388	0.333	1.783	0.032

Problem 436	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	20	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.019	0.190	0.011	0.000	0.000	0.000	0.000	0.000

Problem 437	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	82	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.050	0.345	0.005	0.000	0.000	0.000	0.000	0.000

Problem 438	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	297	297	191	368	267	212	0	250	230
N.S.	1	1.00	0.64	1.24	0.90	0.71	0.00	0.84	0.77
time (sec)	N/A	0.450	0.533	0.046	0.377	0.387	0.000	2.520	3.692

Problem 439	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	216	216	144	212	221	148	0	152	150
N.S.	1	1.00	0.67	0.98	1.02	0.69	0.00	0.70	0.69
time (sec)	N/A	0.191	0.357	0.021	0.365	0.369	0.000	2.631	0.301

Problem 440	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	116	102	143	107	0	104	95
N.S.	1	1.00	1.08	0.95	1.34	1.00	0.00	0.97	0.89
time (sec)	N/A	0.076	0.163	0.018	0.349	0.369	0.000	2.620	3.669

Problem 441	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	68	60	58	74	0	68	60
N.S.	1	1.00	1.00	0.88	0.85	1.09	0.00	1.00	0.88
time (sec)	N/A	0.018	0.025	0.017	0.287	0.351	0.000	2.147	0.035

Problem 442	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	28	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.094	0.492	0.008	0.000	0.000	0.000	0.000	0.000

Problem 443	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	128	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.189	0.675	0.007	0.000	0.000	0.000	0.000	0.000

Problem 444	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	266	266	169	550	539	193	0	401	251
N.S.	1	1.00	0.64	2.07	2.03	0.73	0.00	1.51	0.94
time (sec)	N/A	0.250	0.458	0.098	0.459	0.379	0.000	3.565	3.888

Problem 445	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	189	189	123	307	332	128	0	252	153
N.S.	1	1.00	0.65	1.62	1.76	0.68	0.00	1.33	0.81
time (sec)	N/A	0.085	0.335	0.092	0.391	0.380	0.000	2.794	3.850

Problem 446	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	96	131	160	85	0	136	80
N.S.	1	1.00	1.07	1.46	1.78	0.94	0.00	1.51	0.89
time (sec)	N/A	0.033	0.208	0.041	0.353	0.366	0.000	2.806	3.705

Problem 447	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.020	0.360	0.015	0.000	0.000	0.000	0.000	0.000

Problem 448	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	120	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.074	0.753	0.014	0.000	0.000	0.000	0.000	0.000

Problem 449	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	207	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.149	0.854	0.019	0.000	0.000	0.000	0.000	0.000

Problem 450	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	B	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	31	45	539	41	85	798	44
N.S.	1	1.00	0.69	1.00	11.98	0.91	1.89	17.73	0.98
time (sec)	N/A	0.038	0.590	0.078	0.470	0.378	0.062	2.848	3.810

Problem 451	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	86	99	332	74	0	88	92
N.S.	1	1.00	1.10	1.27	4.26	0.95	0.00	1.13	1.18
time (sec)	N/A	0.041	0.561	0.080	0.412	0.365	0.000	2.629	3.793

Problem 452	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	18	17	17	24	17	17
N.S.	1	1.00	1.00	1.06	1.00	1.00	1.41	1.00	1.00
time (sec)	N/A	0.014	0.064	0.012	0.281	0.415	0.041	2.431	3.624

Problem 453	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	40	0	47	0	0	-1
N.S.	1	1.00	1.00	1.03	0.00	1.21	0.00	0.00	-0.03
time (sec)	N/A	0.024	0.180	0.071	0.000	0.372	0.000	0.000	0.000

Problem 454	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	96	101	0	85	0	0	76
N.S.	1	1.00	1.14	1.20	0.00	1.01	0.00	0.00	0.90
time (sec)	N/A	0.042	0.709	0.095	0.000	0.370	0.000	0.000	4.142

Problem 455	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	79	88	0	106	0	0	-1
N.S.	1	1.00	1.14	1.28	0.00	1.54	0.00	0.00	-0.01
time (sec)	N/A	0.048	0.640	0.082	0.000	0.405	0.000	0.000	0.000

Problem 456	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	B	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	29	42	536	40	83	742	43
N.S.	1	1.00	0.67	0.98	12.47	0.93	1.93	17.26	1.00
time (sec)	N/A	0.029	0.223	0.068	0.464	0.367	0.064	3.270	3.688

Problem 457	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	84	90	329	68	0	77	86
N.S.	1	1.00	1.12	1.20	4.39	0.91	0.00	1.03	1.15
time (sec)	N/A	0.040	0.205	0.077	0.390	0.380	0.000	2.736	3.647

Problem 458	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	17	16	16	22	16	16
N.S.	1	1.00	1.00	1.06	1.00	1.00	1.38	1.00	1.00
time (sec)	N/A	0.010	0.021	0.010	0.271	0.362	0.041	3.070	3.516

Problem 459	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	37	33	0	42	0	0	-1
N.S.	1	1.00	1.00	0.89	0.00	1.14	0.00	0.00	-0.03
time (sec)	N/A	0.020	0.048	0.089	0.000	0.362	0.000	0.000	0.000

Problem 460	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	94	87	0	79	0	0	73
N.S.	1	1.00	1.16	1.07	0.00	0.98	0.00	0.00	0.90
time (sec)	N/A	0.033	0.214	0.075	0.000	0.378	0.000	0.000	3.781

Problem 461	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	77	74	0	100	0	0	-1
N.S.	1	1.00	1.17	1.12	0.00	1.52	0.00	0.00	-0.02
time (sec)	N/A	0.040	0.210	0.081	0.000	0.364	0.000	0.000	0.000

Problem 462	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	145	145	133	142	0	128	0	0	-1
N.S.	1	1.00	0.92	0.98	0.00	0.88	0.00	0.00	-0.01
time (sec)	N/A	0.244	0.220	0.080	0.000	0.399	0.000	0.000	0.000

Problem 463	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	93	112	0	80	0	0	-1
N.S.	1	1.00	0.84	1.01	0.00	0.72	0.00	0.00	-0.01
time (sec)	N/A	0.179	0.180	0.069	0.000	0.380	0.000	0.000	0.000

Problem 464	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	118	118	94	102	0	98	0	0	-1
N.S.	1	1.00	0.80	0.86	0.00	0.83	0.00	0.00	-0.01
time (sec)	N/A	0.087	0.069	0.065	0.000	0.362	0.000	0.000	0.000

Problem 465	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	83	323	0	72	0	0	-1
N.S.	1	1.00	0.83	3.23	0.00	0.72	0.00	0.00	-0.01
time (sec)	N/A	0.093	0.066	0.077	0.000	0.432	0.000	0.000	0.000

Problem 466	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	132	132	120	660	0	106	0	0	-1
N.S.	1	1.00	0.91	5.00	0.00	0.80	0.00	0.00	-0.01
time (sec)	N/A	0.172	0.124	0.071	0.000	0.356	0.000	0.000	0.000

Problem 467	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	212	212	232	561	0	314	0	0	-1
N.S.	1	1.00	1.09	2.65	0.00	1.48	0.00	0.00	-0.00
time (sec)	N/A	0.422	0.670	0.135	0.000	0.376	0.000	0.000	0.000

Problem 468	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	169	169	163	369	0	240	0	0	-1
N.S.	1	1.00	0.96	2.18	0.00	1.42	0.00	0.00	-0.01
time (sec)	N/A	0.288	0.357	0.092	0.000	0.451	0.000	0.000	0.000

Problem 469	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	138	138	127	169	0	187	0	0	-1
N.S.	1	1.00	0.92	1.22	0.00	1.36	0.00	0.00	-0.01
time (sec)	N/A	0.137	0.135	0.089	0.000	0.377	0.000	0.000	0.000

Problem 470	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	158	158	153	685	0	221	0	0	-1
N.S.	1	1.00	0.97	4.34	0.00	1.40	0.00	0.00	-0.01
time (sec)	N/A	0.151	0.169	0.103	0.000	0.363	0.000	0.000	0.000

Problem 471	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	186	186	217	1730	0	266	0	0	-1
N.S.	1	1.00	1.17	9.30	0.00	1.43	0.00	0.00	-0.01
time (sec)	N/A	0.292	0.336	0.114	0.000	0.415	0.000	0.000	0.000

Problem 472	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	232	232	268	3532	0	323	0	0	-1
N.S.	1	1.00	1.16	15.22	0.00	1.39	0.00	0.00	-0.00
time (sec)	N/A	0.356	0.446	0.138	0.000	0.401	0.000	0.000	0.000

Problem 473	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	27	33	30	25	41	0	26
N.S.	1	1.00	0.90	1.10	1.00	0.83	1.37	0.00	0.87
time (sec)	N/A	0.025	0.094	0.022	0.477	0.364	0.136	0.000	3.596

Problem 474	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	27	33	30	25	31	31	26
N.S.	1	1.00	0.90	1.10	1.00	0.83	1.03	1.03	0.87
time (sec)	N/A	0.023	0.011	0.015	0.284	0.381	0.063	1.627	3.606

Problem 475	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	26	35	33	27	44	0	27
N.S.	1	1.00	0.81	1.09	1.03	0.84	1.38	0.00	0.84
time (sec)	N/A	0.026	0.106	0.019	0.483	0.391	0.141	0.000	3.614

Problem 476	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	26	35	33	27	34	34	27
N.S.	1	1.00	0.81	1.09	1.03	0.84	1.06	1.06	0.84
time (sec)	N/A	0.026	0.011	0.014	0.285	0.365	0.066	1.943	3.578

Problem 477	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	36	50	59	39	90	0	-1
N.S.	1	1.00	0.62	0.86	1.02	0.67	1.55	0.00	-0.02
time (sec)	N/A	0.040	0.107	0.020	0.477	0.354	0.197	0.000	0.000

Problem 478	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	36	50	59	39	90	48	47
N.S.	1	1.00	0.62	0.86	1.02	0.67	1.55	0.83	0.81
time (sec)	N/A	0.036	0.013	0.016	0.281	0.368	0.096	2.342	3.681

Problem 479	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	38	50	58	41	90	0	-1
N.S.	1	1.00	0.66	0.86	1.00	0.71	1.55	0.00	-0.02
time (sec)	N/A	0.040	0.105	0.016	0.527	0.348	0.173	0.000	0.000

Problem 480	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	38	50	58	41	90	50	47
N.S.	1	1.00	0.66	0.86	1.00	0.71	1.55	0.86	0.81
time (sec)	N/A	0.036	0.014	0.015	0.278	0.386	0.098	3.118	3.652

Problem 481	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	53	21	86	29	0	22
N.S.	1	1.00	1.00	1.77	0.70	2.87	0.97	0.00	0.73
time (sec)	N/A	0.019	0.039	0.024	0.486	0.405	0.145	0.000	3.544

Problem 482	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	53	21	86	24	21	22
N.S.	1	1.00	1.00	1.77	0.70	2.87	0.80	0.70	0.73
time (sec)	N/A	0.018	0.006	0.022	0.494	0.402	0.073	2.191	3.583

Problem 483	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	49	45	86	29	0	22
N.S.	1	1.00	1.00	1.63	1.50	2.87	0.97	0.00	0.73
time (sec)	N/A	0.019	0.041	0.024	0.482	0.480	0.152	0.000	3.784

Problem 484	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	49	45	86	24	24	22
N.S.	1	1.00	1.00	1.63	1.50	2.87	0.80	0.80	0.73
time (sec)	N/A	0.023	0.006	0.024	0.497	0.456	0.079	2.113	3.587

Problem 485	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	40	74	68	102	39	0	35
N.S.	1	1.00	0.93	1.72	1.58	2.37	0.91	0.00	0.81
time (sec)	N/A	0.029	0.045	0.026	0.487	0.451	0.097	0.000	3.606

Problem 486	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	40	74	39	102	44	38	35
N.S.	1	1.00	0.93	1.72	0.91	2.37	1.02	0.88	0.81
time (sec)	N/A	0.028	0.008	0.026	0.488	0.413	0.107	2.384	3.539

Problem 487	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	40	70	88	103	39	0	35
N.S.	1	1.00	0.93	1.63	2.05	2.40	0.91	0.00	0.81
time (sec)	N/A	0.030	0.042	0.030	0.498	0.370	0.098	0.000	3.676

Problem 488	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	40	70	65	103	44	39	35
N.S.	1	1.00	0.93	1.63	1.51	2.40	1.02	0.91	0.81
time (sec)	N/A	0.030	0.009	0.025	0.488	0.375	0.132	2.572	3.619

Problem 489	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	33	0	0	77	85	0	28
N.S.	1	1.00	1.06	0.00	0.00	2.48	2.74	0.00	0.90
time (sec)	N/A	0.027	0.058	180.000	0.000	0.390	0.382	0.000	3.678

Problem 490	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	33	0	22	77	85	31	28
N.S.	1	1.00	1.06	0.00	0.71	2.48	2.74	1.00	0.90
time (sec)	N/A	0.026	0.005	180.000	0.290	0.377	0.396	2.604	3.713

Problem 491	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	34	0	0	92	82	0	33
N.S.	1	1.00	1.06	0.00	0.00	2.88	2.56	0.00	1.03
time (sec)	N/A	0.027	0.076	180.000	0.000	0.363	0.405	0.000	3.774

Problem 492	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	34	0	22	92	82	36	33
N.S.	1	1.00	1.06	0.00	0.69	2.88	2.56	1.12	1.03
time (sec)	N/A	0.027	0.005	180.000	0.481	0.382	0.414	2.910	3.634

Problem 493	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	35	40	19	30	0	0	24
N.S.	1	1.00	1.46	1.67	0.79	1.25	0.00	0.00	1.00
time (sec)	N/A	0.034	0.055	0.017	0.522	0.349	0.000	0.000	3.507

Problem 494	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	35	40	24	30	0	29	24
N.S.	1	1.00	1.46	1.67	1.00	1.25	0.00	1.21	1.00
time (sec)	N/A	0.032	0.007	0.011	0.291	0.425	0.000	2.840	3.549

Problem 495	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	38	44	21	32	0	0	25
N.S.	1	1.00	1.52	1.76	0.84	1.28	0.00	0.00	1.00
time (sec)	N/A	0.035	0.055	0.016	0.522	0.443	0.000	0.000	3.556

Problem 496	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	38	44	25	32	0	33	25
N.S.	1	1.00	1.52	1.76	1.00	1.28	0.00	1.32	1.00
time (sec)	N/A	0.035	0.007	0.010	0.290	0.446	0.000	1.356	3.512

Problem 497	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	29	29	68	27	56	0	28
N.S.	1	1.00	0.66	0.66	1.55	0.61	1.27	0.00	0.64
time (sec)	N/A	0.029	0.060	0.017	0.484	0.371	0.359	0.000	3.681

Problem 498	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	29	29	38	27	58	31	28
N.S.	1	1.00	0.66	0.66	0.86	0.61	1.32	0.70	0.64
time (sec)	N/A	0.029	0.012	0.008	0.277	0.373	0.351	2.987	3.618

Problem 499	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	30	29	71	28	58	0	28
N.S.	1	1.00	0.65	0.63	1.54	0.61	1.26	0.00	0.61
time (sec)	N/A	0.031	0.060	0.011	0.490	0.346	0.365	0.000	3.644

Problem 500	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	30	29	40	28	60	33	28
N.S.	1	1.00	0.65	0.63	0.87	0.61	1.30	0.72	0.61
time (sec)	N/A	0.030	0.011	0.008	0.280	0.354	0.369	4.301	3.536

Problem 501	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	93	93	111	0	0	166	0	0	-1
N.S.	1	1.00	1.19	0.00	0.00	1.78	0.00	0.00	-0.01
time (sec)	N/A	0.054	0.275	0.009	0.000	0.370	0.000	0.000	0.000

Problem 502	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	93	93	111	0	124	166	0	94	-1
N.S.	1	1.00	1.19	0.00	1.33	1.78	0.00	1.01	-0.01
time (sec)	N/A	0.051	0.023	0.005	0.485	0.359	0.000	5.690	0.000

Problem 503	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	115	0	0	174	0	0	-1
N.S.	1	1.00	1.20	0.00	0.00	1.81	0.00	0.00	-0.01
time (sec)	N/A	0.053	0.275	0.007	0.000	0.390	0.000	0.000	0.000

Problem 504	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	115	0	130	174	0	96	-1
N.S.	1	1.00	1.20	0.00	1.35	1.81	0.00	1.00	-0.01
time (sec)	N/A	0.062	0.010	0.005	0.491	0.358	0.000	5.708	0.000

Problem 505	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	18	18	15	25	14	15	15
N.S.	1	1.00	1.06	1.06	0.88	1.47	0.82	0.88	0.88
time (sec)	N/A	0.012	0.020	0.017	0.280	0.349	0.021	4.316	3.264

Problem 506	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	27	21	18	18	17	18	18
N.S.	1	1.00	1.12	0.88	0.75	0.75	0.71	0.75	0.75
time (sec)	N/A	0.014	0.024	0.020	0.301	0.415	0.041	3.420	0.075

Problem 507	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	54	35	43	53	22	46	32
N.S.	1	1.00	0.96	0.62	0.77	0.95	0.39	0.82	0.57
time (sec)	N/A	0.021	0.065	0.020	0.479	0.362	0.045	3.582	3.695

Problem 508	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	47	37	34	34	24	34	34
N.S.	1	1.00	1.07	0.84	0.77	0.77	0.55	0.77	0.77
time (sec)	N/A	0.026	0.035	0.018	0.489	0.399	0.044	4.297	3.518

Problem 509	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	69	65	0	219	63	63	63
N.S.	1	1.00	1.03	0.97	0.00	3.27	0.94	0.94	0.94
time (sec)	N/A	0.046	0.135	0.086	0.000	0.409	0.156	3.954	0.232

Problem 510	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	38	38	37	49	0	0	-1
N.S.	1	1.00	0.86	0.86	0.84	1.11	0.00	0.00	-0.02
time (sec)	N/A	0.085	0.053	0.024	0.279	0.384	0.000	0.000	0.000

Problem 511	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	49	41	38	38	0	0	-1
N.S.	1	1.00	0.91	0.76	0.70	0.70	0.00	0.00	-0.02
time (sec)	N/A	0.085	0.051	0.034	0.282	0.388	0.000	0.000	0.000

Problem 512	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	180	180	120	183	0	86	0	0	-1
N.S.	1	1.00	0.67	1.02	0.00	0.48	0.00	0.00	-0.01
time (sec)	N/A	0.131	0.076	0.015	0.000	0.367	0.000	0.000	0.000

Problem 513	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	204	204	144	235	0	100	0	0	-1
N.S.	1	1.00	0.71	1.15	0.00	0.49	0.00	0.00	-0.00
time (sec)	N/A	0.139	0.080	0.028	0.000	0.370	0.000	0.000	0.000

Problem 514	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	276	276	205	376	0	280	0	0	-1
N.S.	1	1.00	0.74	1.36	0.00	1.01	0.00	0.00	-0.00
time (sec)	N/A	0.281	0.167	0.042	0.000	0.409	0.000	0.000	0.000

Problem 515	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	57	65	62	76	0	0	-1
N.S.	1	1.00	0.79	0.90	0.86	1.06	0.00	0.00	-0.01
time (sec)	N/A	0.151	0.081	0.020	0.281	0.361	0.000	0.000	0.000

Problem 516	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	77	62	59	59	0	0	-1
N.S.	1	1.00	1.00	0.81	0.77	0.77	0.00	0.00	-0.01
time (sec)	N/A	0.138	0.064	0.016	0.314	0.378	0.000	0.000	0.000

Problem 517	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	259	259	172	0	0	138	0	0	-1
N.S.	1	1.00	0.66	0.00	0.00	0.53	0.00	0.00	-0.00
time (sec)	N/A	0.193	0.106	0.011	0.000	0.400	0.000	0.000	0.000

Problem 518	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	293	293	216	0	0	150	0	0	-1
N.S.	1	1.00	0.74	0.00	0.00	0.51	0.00	0.00	-0.00
time (sec)	N/A	0.206	0.139	0.009	0.000	0.380	0.000	0.000	0.000

Problem 519	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	391	391	407	0	0	415	0	0	-1
N.S.	1	1.00	1.04	0.00	0.00	1.06	0.00	0.00	-0.00
time (sec)	N/A	0.422	0.156	0.013	0.000	0.372	0.000	0.000	0.000

Problem 520	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	44	46	48	59	34	0	50
N.S.	1	1.00	1.10	1.15	1.20	1.48	0.85	0.00	1.25
time (sec)	N/A	0.017	0.058	0.030	0.276	0.381	0.049	0.000	3.520

Problem 521	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	92	547	0	309	104	110	96
N.S.	1	1.00	0.98	5.82	0.00	3.29	1.11	1.17	1.02
time (sec)	N/A	0.061	0.150	0.061	0.000	0.386	0.243	5.492	3.668

Problem 522	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	92	546	0	309	104	110	96
N.S.	1	1.00	0.98	5.81	0.00	3.29	1.11	1.17	1.02
time (sec)	N/A	0.059	0.152	0.071	0.000	0.383	0.242	6.205	3.806

Problem 523	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	88	143	95	143	0	0	-1
N.S.	1	1.00	0.92	1.49	0.99	1.49	0.00	0.00	-0.01
time (sec)	N/A	0.162	0.152	0.038	0.303	0.406	0.000	0.000	0.000

Problem 524	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	B	F(-2)	A	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	338	338	0	855	0	497	0	0	-1
N.S.	1	1.00	0.00	2.53	0.00	1.47	0.00	0.00	-0.00
time (sec)	N/A	0.456	5.105	0.048	0.000	0.378	0.000	0.000	0.000

Problem 525	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	145	145	123	232	159	210	0	0	-1
N.S.	1	1.00	0.85	1.60	1.10	1.45	0.00	0.00	-0.01
time (sec)	N/A	0.295	0.200	0.042	0.299	0.407	0.000	0.000	0.000

Problem 526	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F(-2)	A	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	484	484	0	0	0	694	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	1.43	0.00	0.00	-0.00
time (sec)	N/A	0.594	3.822	0.012	0.000	0.378	0.000	0.000	0.000

Problem 527	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	103	103	118	993	0	332	139	120	105
N.S.	1	1.00	1.15	9.64	0.00	3.22	1.35	1.17	1.02
time (sec)	N/A	0.110	0.197	0.106	0.000	0.377	0.659	4.154	3.807

Problem 528	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	103	103	118	993	0	332	139	120	105
N.S.	1	1.00	1.15	9.64	0.00	3.22	1.35	1.17	1.02
time (sec)	N/A	0.101	0.009	0.000	0.000	0.403	0.644	6.041	0.002

Problem 529	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	9	9	9	9	8	8	7	8	8
N.S.	1	1.00	1.00	1.00	0.89	0.89	0.78	0.89	0.89
time (sec)	N/A	0.008	0.012	0.012	0.277	0.383	0.016	2.885	0.056

Problem 530	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	19	18	23	14	28	18
N.S.	1	1.00	1.00	0.95	0.90	1.15	0.70	1.40	0.90
time (sec)	N/A	0.092	0.032	0.017	0.283	0.425	0.033	4.943	0.064

Problem 531	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	33	32	30	38	0	0	-1
N.S.	1	1.00	0.97	0.94	0.88	1.12	0.00	0.00	-0.03
time (sec)	N/A	0.169	0.049	0.016	0.280	0.361	0.000	0.000	0.000

Problem 532	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	23	22	20	19	22	20
N.S.	1	1.00	1.00	1.15	1.10	1.00	0.95	1.10	1.00
time (sec)	N/A	0.014	0.027	0.014	0.281	0.375	0.036	3.929	3.558

Problem 533	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	44	64	57	61	42	0	52
N.S.	1	1.00	0.88	1.28	1.14	1.22	0.84	0.00	1.04
time (sec)	N/A	0.199	0.081	0.018	0.285	0.354	0.055	0.000	3.617

Problem 534	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	63	134	74	114	0	0	-1
N.S.	1	1.00	0.84	1.79	0.99	1.52	0.00	0.00	-0.01
time (sec)	N/A	0.328	0.117	0.039	0.294	0.425	0.000	0.000	0.000

Problem 535	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	14	14	13	12	13	13
N.S.	1	1.00	1.00	1.08	1.08	1.00	0.92	1.00	1.00
time (sec)	N/A	0.009	0.031	0.016	0.282	0.375	0.031	2.834	3.478

Problem 536	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	18	18	19	17	17	18	17
N.S.	1	1.00	0.78	0.78	0.83	0.74	0.74	0.78	0.74
time (sec)	N/A	0.013	0.030	0.011	0.281	0.405	0.046	3.938	0.121

Problem 537	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	40	36	0	126	36	35	35
N.S.	1	1.00	1.11	1.00	0.00	3.50	1.00	0.97	0.97
time (sec)	N/A	0.042	0.043	0.018	0.000	0.396	0.117	4.486	0.206

Problem 538	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	159	159	123	171	0	214	0	0	-1
N.S.	1	1.00	0.77	1.08	0.00	1.35	0.00	0.00	-0.01
time (sec)	N/A	0.210	0.075	0.017	0.000	0.362	0.000	0.000	0.000

Problem 539	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	244	244	185	0	0	316	0	0	-1
N.S.	1	1.00	0.76	0.00	0.00	1.30	0.00	0.00	-0.00
time (sec)	N/A	0.342	0.063	0.007	0.000	0.380	0.000	0.000	0.000

Problem 540	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	51	135	0	189	66	48	47
N.S.	1	1.00	1.09	2.87	0.00	4.02	1.40	1.02	1.00
time (sec)	N/A	0.050	0.111	0.039	0.000	0.369	0.174	4.934	3.643

Problem 541	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	B	F(-2)	A	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	203	203	0	433	0	353	0	0	-1
N.S.	1	1.00	0.00	2.13	0.00	1.74	0.00	0.00	-0.00
time (sec)	N/A	0.276	0.393	0.042	0.000	0.389	0.000	0.000	0.000

Problem 542	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F(-2)	A	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	310	310	0	0	0	489	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	1.58	0.00	0.00	-0.00
time (sec)	N/A	0.458	0.222	0.010	0.000	0.382	0.000	0.000	0.000

Problem 543	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	53	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.101	0.290	0.031	0.000	0.000	0.000	0.000	0.000

Problem 544	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	154	154	0	0	0	0	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.177	0.636	0.033	0.000	0.000	0.000	0.000	0.000

Problem 545	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	112	112	0	0	0	0	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.154	0.645	0.031	0.000	0.000	0.000	0.000	0.000

Problem 546	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	0	0	0	0	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.086	0.282	0.033	0.000	0.000	0.000	0.000	0.000

Problem 547	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	26	37	36	28	128	49	40
N.S.	1	1.00	0.72	1.03	1.00	0.78	3.56	1.36	1.11
time (sec)	N/A	0.010	0.008	0.118	0.319	0.397	0.161	4.786	0.100

Problem 548	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	53	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.105	0.155	0.032	0.000	0.000	0.000	0.000	0.000

Problem 549	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	53	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.098	0.712	0.031	0.000	0.000	0.000	0.000	0.000

Problem 550	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	50	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.150	0.486	0.011	0.000	0.000	0.000	0.000	0.000

Problem 551	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	0	0	0	0	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.228	0.892	0.010	0.000	0.000	0.000	0.000	0.000

Problem 552	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	0	0	0	0	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.205	0.849	0.009	0.000	0.000	0.000	0.000	0.000

Problem 553	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	0	0	0	0	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.119	0.303	0.010	0.000	0.000	0.000	0.000	0.000

Problem 554	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	31	31	39	20	38	14
N.S.	1	1.00	1.00	2.21	2.21	2.79	1.43	2.71	1.00
time (sec)	N/A	0.005	0.003	0.071	0.300	0.406	0.050	4.072	3.426

Problem 555	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	50	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.158	0.320	0.008	0.000	0.000	0.000	0.000	0.000

Problem 556	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	50	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.153	0.937	0.009	0.000	0.000	0.000	0.000	0.000

Problem 557	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	77	0	0	0	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.166	0.203	0.023	0.000	0.000	0.000	0.000	0.000

Problem 558	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	29	0	0	0	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.074	0.163	0.010	0.000	0.000	0.000	0.000	0.000

Problem 559	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	29	0	0	0	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.072	0.160	0.010	0.000	0.000	0.000	0.000	0.000

Problem 560	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	0	0	0	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.060	0.142	0.010	0.000	0.000	0.000	0.000	0.000

Problem 561	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	29	0	0	0	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.068	0.153	0.010	0.000	0.000	0.000	0.000	0.000

Problem 562	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	29	0	0	0	0	0	-1
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.070	0.157	0.009	0.000	0.000	0.000	0.000	0.000

Problem 563	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	35	52	67	71	583	2631	35
N.S.	1	1.00	0.71	1.06	1.37	1.45	11.90	53.69	0.71
time (sec)	N/A	0.046	0.032	0.031	0.277	0.359	0.519	5.494	0.053

Problem 564	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	26	25	37	34	190	994	23
N.S.	1	1.00	0.84	0.81	1.19	1.10	6.13	32.06	0.74
time (sec)	N/A	0.019	0.017	0.020	0.283	0.403	0.349	4.767	0.020

Problem 565	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	B	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	15	0	14	31	237	14
N.S.	1	1.00	1.00	1.07	0.00	1.00	2.21	16.93	1.00
time (sec)	N/A	0.009	0.012	0.016	0.000	0.395	0.236	5.860	3.596

Problem 566	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	8	8	10	56	8	10	0	0	8
N.S.	1	1.00	1.25	7.00	1.00	1.25	0.00	0.00	1.00
time (sec)	N/A	0.027	0.017	0.023	0.325	0.391	0.000	0.000	0.026

Problem 567	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	C	A	A	F	F	B
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	0	160	16	34	0	0	28
N.S.	1	1.00	0.00	6.15	0.62	1.31	0.00	0.00	1.08
time (sec)	N/A	0.041	0.044	0.032	0.335	0.389	0.000	0.000	3.504

Problem 568	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	C	A	A	F	F	B
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	0	225	19	61	0	0	59
N.S.	1	1.00	0.00	4.41	0.37	1.20	0.00	0.00	1.16
time (sec)	N/A	0.064	0.049	0.034	0.320	0.366	0.000	0.000	0.053

Problem 569	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	B	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	21	20	0	19	49	313	19
N.S.	1	1.00	1.11	1.05	0.00	1.00	2.58	16.47	1.00
time (sec)	N/A	0.030	0.022	0.038	0.000	0.363	0.596	4.679	3.514

Problem 570	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	F(-2)	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	20	0	18	0	216	18
N.S.	1	1.00	1.00	1.11	0.00	1.00	0.00	12.00	1.00
time (sec)	N/A	0.015	0.016	0.018	0.000	0.346	0.000	2.980	3.585

Problem 571	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	43	56	72	75	333	1817	43
N.S.	1	1.00	0.70	0.92	1.18	1.23	5.46	29.79	0.70
time (sec)	N/A	0.047	0.032	0.024	0.278	0.380	0.435	5.369	3.561

Problem 572	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F(-2)	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	770	770	2448	0	0	3031	0	0	-1
N.S.	1	1.00	3.18	0.00	0.00	3.94	0.00	0.00	-0.00
time (sec)	N/A	0.936	2.897	0.116	0.000	0.510	0.000	0.000	0.000

Problem 573	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F(-2)	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	599	599	1419	0	0	1834	0	0	-1
N.S.	1	1.00	2.37	0.00	0.00	3.06	0.00	0.00	-0.00
time (sec)	N/A	0.695	1.559	0.090	0.000	0.472	0.000	0.000	0.000

Problem 574	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	428	428	644	1261	0	885	0	0	-1
N.S.	1	1.00	1.50	2.95	0.00	2.07	0.00	0.00	-0.00
time (sec)	N/A	0.379	1.387	0.051	0.000	0.394	0.000	0.000	0.000

Problem 575	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	B	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	100	183	0	327	116	98	91
N.S.	1	1.00	1.05	1.93	0.00	3.44	1.22	1.03	0.96
time (sec)	N/A	0.104	0.184	0.093	0.000	0.392	0.548	4.607	3.785

Problem 576	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	84	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.688	0.908	0.054	0.000	0.000	0.000	0.000	0.000

Problem 577	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	84	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.616	7.414	0.067	0.000	0.000	0.000	0.000	0.000

Problem 578	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	150	176	285	0	293	0	0	-1
N.S.	1	1.00	1.17	1.90	0.00	1.95	0.00	0.00	-0.01
time (sec)	N/A	0.458	0.359	0.060	0.000	0.362	0.000	0.000	0.000

Problem 579	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	85	0	0	0	0	0	-1
N.S.	1	1.00	1.31	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.037	0.151	0.010	0.000	0.000	0.000	0.000	0.000

Problem 580	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	85	0	0	0	0	0	-1
N.S.	1	1.00	1.31	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.023	0.103	0.008	0.000	0.000	0.000	0.000	0.000

Problem 581	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	83	0	0	0	0	0	58
N.S.	1	1.00	1.48	0.00	0.00	0.00	0.00	0.00	1.04
time (sec)	N/A	0.016	0.089	0.030	0.000	0.000	0.000	0.000	4.007

Problem 582	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	50	0	0	0	0	0	-1
N.S.	1	1.00	0.88	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.043	0.094	0.011	0.000	0.000	0.000	0.000	0.000

Problem 583	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	81	0	0	0	0	0	-1
N.S.	1	1.00	1.23	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.033	0.114	0.008	0.000	0.000	0.000	0.000	0.000

Problem 584	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	85	0	0	0	0	0	-1
N.S.	1	1.00	1.25	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.032	0.114	0.009	0.000	0.000	0.000	0.000	0.000

Problem 585	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	94	0	0	0	0	0	-1
N.S.	1	1.00	1.22	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.038	0.151	0.036	0.000	0.000	0.000	0.000	0.000

Problem 586	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	A	F	C	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	0	0	0	55	0	53	-1
N.S.	1	1.00	0.00	0.00	0.00	0.72	0.00	0.70	-0.01
time (sec)	N/A	0.042	0.061	0.025	0.000	0.424	0.000	4.998	0.000

Problem 587	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	A	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	137	137	0	0	0	143	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	1.04	0.00	0.00	-0.01
time (sec)	N/A	0.165	0.111	0.017	0.000	0.379	0.000	0.000	0.000

Problem 588	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	B	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	123	123	123	0	0	119	546	0	-1
N.S.	1	1.00	1.00	0.00	0.00	0.97	4.44	0.00	-0.01
time (sec)	N/A	0.094	0.189	0.029	0.000	0.364	114.987	0.000	0.000

Problem 589	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	B	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	115	0	0	112	372	0	-1
N.S.	1	1.00	1.00	0.00	0.00	0.97	3.23	0.00	-0.01
time (sec)	N/A	0.082	0.435	0.023	0.000	0.360	27.538	0.000	0.000

Problem 590	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	B	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	118	118	118	0	0	116	228	101	-1
N.S.	1	1.00	1.00	0.00	0.00	0.98	1.93	0.86	-0.01
time (sec)	N/A	0.064	0.070	0.021	0.000	0.376	7.982	5.125	0.000

Problem 591	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	67	382	0	57	0	0	49
N.S.	1	1.00	1.00	5.70	0.00	0.85	0.00	0.00	0.73
time (sec)	N/A	0.047	0.054	0.338	0.000	0.358	0.000	0.000	3.745

Problem 592	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	121	0	0	119	211	0	-1
N.S.	1	1.00	1.00	0.00	0.00	0.98	1.74	0.00	-0.01
time (sec)	N/A	0.072	0.168	0.012	0.000	0.365	96.138	0.000	0.000

Problem 593	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	118	118	117	0	0	114	0	0	-1
N.S.	1	1.00	0.99	0.00	0.00	0.97	0.00	0.00	-0.01
time (sec)	N/A	0.064	0.172	0.015	0.000	0.370	0.000	0.000	0.000

Problem 594	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-2)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.017	2.038	0.016	0.000	0.000	0.000	0.000	0.000

Problem 595	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	502	502	396	0	0	517	0	0	-1
N.S.	1	1.00	0.79	0.00	0.00	1.03	0.00	0.00	-0.00
time (sec)	N/A	0.701	1.442	0.030	0.000	0.383	0.000	0.000	0.000

Problem 596	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	B	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	372	372	303	0	0	370	1068	0	-1
N.S.	1	1.00	0.81	0.00	0.00	0.99	2.87	0.00	-0.00
time (sec)	N/A	0.467	0.447	0.029	0.000	0.374	117.723	0.000	0.000

Problem 597	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	B	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	242	242	204	0	0	234	581	0	-1
N.S.	1	1.00	0.84	0.00	0.00	0.97	2.40	0.00	-0.00
time (sec)	N/A	0.247	0.240	0.032	0.000	0.364	27.689	0.000	0.000

Problem 598	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	B	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	118	118	118	0	0	116	228	101	-1
N.S.	1	1.00	1.00	0.00	0.00	0.98	1.93	0.86	-0.01
time (sec)	N/A	0.038	0.049	0.000	0.000	0.366	7.884	3.627	0.000

Problem 599	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.019	0.599	0.012	0.000	0.000	0.000	0.000	0.000

Problem 600	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.018	2.083	0.012	0.000	0.000	0.000	0.000	0.000

Problem 601	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.018	2.978	0.012	0.000	0.000	0.000	0.000	0.000

Problem 602	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	A	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	153	153	0	0	0	169	0	0	-1
N.S.	1	1.00	0.00	0.00	0.00	1.10	0.00	0.00	-0.01
time (sec)	N/A	0.304	0.171	180.000	0.000	0.349	0.000	0.000	0.000

Problem 603	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	133	133	129	0	0	134	0	0	-1
N.S.	1	1.00	0.97	0.00	0.00	1.01	0.00	0.00	-0.01
time (sec)	N/A	0.159	0.235	0.015	0.000	0.353	0.000	0.000	0.000

Problem 604	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	120	0	0	128	0	0	-1
N.S.	1	1.00	0.98	0.00	0.00	1.05	0.00	0.00	-0.01
time (sec)	N/A	0.150	0.600	0.007	0.000	0.412	0.000	0.000	0.000

Problem 605	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	123	0	0	131	0	116	-1
N.S.	1	1.00	0.98	0.00	0.00	1.04	0.00	0.92	-0.01
time (sec)	N/A	0.136	0.069	0.026	0.000	0.390	0.000	4.530	0.000

Problem 606	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	59	125	0	66	0	0	63
N.S.	1	1.00	0.84	1.79	0.00	0.94	0.00	0.00	0.90
time (sec)	N/A	0.087	0.060	0.280	0.000	0.361	0.000	0.000	3.691

Problem 607	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	126	0	0	134	0	0	-1
N.S.	1	1.00	0.98	0.00	0.00	1.05	0.00	0.00	-0.01
time (sec)	N/A	0.160	0.206	0.014	0.000	0.354	0.000	0.000	0.000

Problem 608	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	121	0	0	129	0	0	-1
N.S.	1	1.00	0.96	0.00	0.00	1.02	0.00	0.00	-0.01
time (sec)	N/A	0.159	0.216	0.016	0.000	0.364	0.000	0.000	0.000

Problem 609	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-2)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.020	1.256	0.018	0.000	0.000	0.000	0.000	0.000

Problem 610	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	535	535	434	0	0	568	0	0	-1
N.S.	1	1.00	0.81	0.00	0.00	1.06	0.00	0.00	-0.00
time (sec)	N/A	0.836	2.082	0.014	0.000	0.397	0.000	0.000	0.000

Problem 611	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	397	397	331	0	0	410	0	0	-1
N.S.	1	1.00	0.83	0.00	0.00	1.03	0.00	0.00	-0.00
time (sec)	N/A	0.539	0.591	0.014	0.000	0.443	0.000	0.000	0.000

Problem 612	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	257	257	221	0	0	262	0	0	-1
N.S.	1	1.00	0.86	0.00	0.00	1.02	0.00	0.00	-0.00
time (sec)	N/A	0.285	0.318	0.008	0.000	0.455	0.000	0.000	0.000

Problem 613	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	123	0	0	131	0	116	-1
N.S.	1	1.00	0.98	0.00	0.00	1.04	0.00	0.92	-0.01
time (sec)	N/A	0.084	0.042	0.001	0.000	0.445	0.000	3.183	0.000

Problem 614	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.020	0.980	0.025	0.000	0.000	0.000	0.000	0.000

Problem 615	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.019	3.440	0.014	0.000	0.000	0.000	0.000	0.000

Problem 616	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.019	5.023	0.013	0.000	0.000	0.000	0.000	0.000

Problem 617	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	18	17	17	24	17	17
N.S.	1	1.00	1.00	1.06	1.00	1.00	1.41	1.00	1.00
time (sec)	N/A	0.035	0.045	0.017	0.292	0.450	0.042	1.994	3.684

Problem 618	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	19	21	20	20	32	20	20
N.S.	1	1.00	0.95	1.05	1.00	1.00	1.60	1.00	1.00
time (sec)	N/A	0.120	0.040	0.149	0.290	0.383	0.257	3.184	3.998

Problem 619	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	44	0	0	23	0	0	49
N.S.	1	1.00	0.90	0.00	0.00	0.47	0.00	0.00	1.00
time (sec)	N/A	0.141	0.111	0.081	0.000	0.104	0.000	0.000	3.689

Problem 620	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	49	87	2381	109	160	53	145
N.S.	1	1.00	0.54	0.97	26.46	1.21	1.78	0.59	1.61
time (sec)	N/A	0.126	0.109	0.125	0.865	0.367	0.118	2.819	3.793

Problem 621	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	36	62	1223	55	68	42	64
N.S.	1	1.00	0.56	0.97	19.11	0.86	1.06	0.66	1.00
time (sec)	N/A	0.113	0.107	0.111	0.601	0.386	0.079	3.302	3.614

Problem 622	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	23	37	501	23	22	23	23
N.S.	1	1.00	0.61	0.97	13.18	0.61	0.58	0.61	0.61
time (sec)	N/A	0.065	0.081	0.021	0.428	0.379	0.052	3.618	0.102

Problem 623	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	12	11	11	10	11	13
N.S.	1	1.00	1.00	1.00	0.92	0.92	0.83	0.92	1.08
time (sec)	N/A	0.013	0.047	0.015	0.289	0.382	0.035	3.510	0.075

Problem 624	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	11	10	19	0	11	10	11	11
N.S.	1	1.00	0.91	1.73	0.00	1.00	0.91	1.00	1.00
time (sec)	N/A	0.119	0.099	0.098	0.000	0.396	9.075	3.843	3.787

Problem 625	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	35	45	0	49	24	0	44
N.S.	1	1.00	0.92	1.18	0.00	1.29	0.63	0.00	1.16
time (sec)	N/A	0.133	0.116	0.107	0.000	0.365	84.573	0.000	3.989

Problem 626	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	50	70	0	111	0	0	62
N.S.	1	1.00	0.69	0.97	0.00	1.54	0.00	0.00	0.86
time (sec)	N/A	0.168	0.135	0.106	0.000	0.370	0.000	0.000	4.043

Problem 627	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	142	142	47	119	0	0	0	91	135
N.S.	1	1.00	0.33	0.84	0.00	0.00	0.00	0.64	0.95
time (sec)	N/A	0.434	2.516	0.114	0.000	0.000	0.000	3.590	4.217

Problem 628	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-2)	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	112	112	46	94	0	0	0	77	117
N.S.	1	1.00	0.41	0.84	0.00	0.00	0.00	0.69	1.04
time (sec)	N/A	0.311	2.011	0.126	0.000	0.000	0.000	2.950	3.910

Problem 629	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	A	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	47	69	0	0	94	63	102
N.S.	1	1.00	0.57	0.84	0.00	0.00	1.15	0.77	1.24
time (sec)	N/A	0.244	1.913	0.098	0.000	0.000	56.657	2.500	3.767

Problem 630	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	A	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	46	44	0	0	78	45	76
N.S.	1	1.00	0.88	0.85	0.00	0.00	1.50	0.87	1.46
time (sec)	N/A	0.156	1.777	0.117	0.000	0.000	2.690	2.828	3.508

Problem 631	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	B	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	46	18	0	0	49	20	49
N.S.	1	1.00	2.19	0.86	0.00	0.00	2.33	0.95	2.33
time (sec)	N/A	0.179	1.837	0.095	0.000	0.000	2.056	2.457	3.896

Problem 632	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	62	45	0	0	80	0	79
N.S.	1	1.00	1.22	0.88	0.00	0.00	1.57	0.00	1.55
time (sec)	N/A	0.212	1.947	0.105	0.000	0.000	3.209	0.000	4.005

Problem 633	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	77	70	0	0	105	0	104
N.S.	1	1.00	0.91	0.82	0.00	0.00	1.24	0.00	1.22
time (sec)	N/A	0.237	3.244	0.098	0.000	0.000	21.019	0.000	4.200

Problem 634	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-2)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	91	95	0	0	0	0	129
N.S.	1	1.00	0.79	0.83	0.00	0.00	0.00	0.00	1.12
time (sec)	N/A	0.244	4.915	0.103	0.000	0.000	0.000	0.000	4.664

Problem 635	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	145	145	103	120	0	0	0	0	154
N.S.	1	1.00	0.71	0.83	0.00	0.00	0.00	0.00	1.06
time (sec)	N/A	0.262	5.952	0.111	0.000	0.000	0.000	0.000	5.698

Problem 636	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	A	B	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	8	8	42	37	14	18	7	9	-1
N.S.	1	1.00	5.25	4.62	1.75	2.25	0.88	1.12	-0.12
time (sec)	N/A	0.018	0.028	0.053	0.475	0.410	0.477	2.999	0.000

Problem 637	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	8	7	7	15	7	7
N.S.	1	1.00	1.00	0.67	0.58	0.58	1.25	0.58	0.58
time (sec)	N/A	0.012	0.014	0.020	0.482	0.413	0.034	3.597	3.584

Problem 638	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	4	4	4	4	15	15	15	16	15
N.S.	1	1.00	1.00	1.00	3.75	3.75	3.75	4.00	3.75
time (sec)	N/A	0.013	0.002	0.015	0.288	0.429	0.034	3.665	0.128

Problem 639	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	14	26	32	15	30	13
N.S.	1	1.00	1.00	0.70	1.30	1.60	0.75	1.50	0.65
time (sec)	N/A	0.014	0.034	0.020	0.480	0.389	0.038	4.031	0.155

Problem 640	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	49	26	25	34	51	25	24
N.S.	1	1.00	1.36	0.72	0.69	0.94	1.42	0.69	0.67
time (sec)	N/A	0.020	0.043	0.023	0.489	0.447	0.687	5.110	0.092

Problem 641	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	14	17	11	11	10	11	11
N.S.	1	1.00	0.64	0.77	0.50	0.50	0.45	0.50	0.50
time (sec)	N/A	0.014	0.016	0.016	0.277	0.408	0.021	3.769	0.037

Problem 642	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	45	21	20	35	29	20	20
N.S.	1	1.00	1.55	0.72	0.69	1.21	1.00	0.69	0.69
time (sec)	N/A	0.018	0.057	0.022	0.482	0.385	0.608	3.777	3.352

Problem 643	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	26	11	12	21	0	21	15
N.S.	1	1.00	1.86	0.79	0.86	1.50	0.00	1.50	1.07
time (sec)	N/A	0.025	0.062	0.019	0.494	0.457	0.000	4.242	3.643

Problem 644	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	16	15	15	15	16	15
N.S.	1	1.00	1.00	1.33	1.25	1.25	1.25	1.33	1.25
time (sec)	N/A	0.013	0.023	0.018	0.286	0.402	0.034	4.700	0.139

Problem 645	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	11	10	10	8	10	10
N.S.	1	1.00	1.00	0.85	0.77	0.77	0.62	0.77	0.77
time (sec)	N/A	0.007	0.011	0.012	0.280	0.409	0.022	3.713	0.059

Problem 646	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	18	17	23	14	17	16
N.S.	1	1.00	1.00	1.12	1.06	1.44	0.88	1.06	1.00
time (sec)	N/A	0.003	0.007	0.018	0.280	0.348	0.019	0.425	3.332

Problem 647	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	21	18	13	13	14	13	13
N.S.	1	1.00	1.17	1.00	0.72	0.72	0.78	0.72	0.72
time (sec)	N/A	0.018	0.025	0.014	0.345	0.427	0.021	5.561	0.075

Problem 648	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	B	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	4	4	18	4	3	20	3	3	3
N.S.	1	1.00	4.50	1.00	0.75	5.00	0.75	0.75	0.75
time (sec)	N/A	0.014	0.030	0.018	0.509	0.364	0.347	4.533	3.533

Problem 649	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	10	10	10	8	7	7	17	7	7
N.S.	1	1.00	1.00	0.80	0.70	0.70	1.70	0.70	0.70
time (sec)	N/A	0.014	0.015	0.019	0.509	0.357	0.037	2.790	3.369

Problem 650	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	24	20	17	21	17	18	17
N.S.	1	1.00	0.89	0.74	0.63	0.78	0.63	0.67	0.63
time (sec)	N/A	0.014	0.022	0.029	0.278	0.403	0.031	3.154	0.075

Problem 651	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	11	10	10	10	10	10
N.S.	1	1.00	1.00	0.92	0.83	0.83	0.83	0.83	0.83
time (sec)	N/A	0.025	0.014	0.013	0.275	0.377	0.024	4.565	3.328

Problem 652	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	6	6	6	6	15	15	15	16	15
N.S.	1	1.00	1.00	1.00	2.50	2.50	2.50	2.67	2.50
time (sec)	N/A	0.012	0.022	0.017	0.285	0.358	0.034	3.231	0.076

Problem 653	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	4	4	4	4	3	3	15	3	3
N.S.	1	1.00	1.00	1.00	0.75	0.75	3.75	0.75	0.75
time (sec)	N/A	0.013	0.002	0.011	0.508	0.377	0.034	5.781	0.052

Problem 654	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	14	17	17	10	11	8	12	11
N.S.	1	1.17	1.42	1.42	0.83	0.92	0.67	1.00	0.92
time (sec)	N/A	0.027	0.028	0.020	0.278	0.379	0.027	5.221	0.056

Problem 655	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	10	12	15	14	8	11	8	11	11
N.S.	1	1.20	1.50	1.40	0.80	1.10	0.80	1.10	1.10
time (sec)	N/A	0.025	0.024	0.017	0.294	0.365	0.026	4.081	3.537

Problem 656	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	39	30	14	13	12	14	22
N.S.	1	1.00	2.17	1.67	0.78	0.72	0.67	0.78	1.22
time (sec)	N/A	0.029	0.040	0.020	0.298	0.379	0.029	4.925	3.340

Problem 657	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	4	4	16	4	3	16	3	16	3
N.S.	1	1.00	4.00	1.00	0.75	4.00	0.75	4.00	0.75
time (sec)	N/A	0.013	0.024	0.017	0.524	0.372	0.312	4.916	0.076

Problem 658	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	11	11	9	8	8	8	8	8
N.S.	1	1.00	1.00	0.82	0.73	0.73	0.73	0.73	0.73
time (sec)	N/A	0.015	0.004	0.065	0.296	0.381	0.066	4.245	3.457

Problem 659	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	14	13	13	0	13	13
N.S.	1	1.00	1.00	0.78	0.72	0.72	0.00	0.72	0.72
time (sec)	N/A	0.040	0.028	0.040	0.504	0.372	0.000	4.967	3.707

Problem 660	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	39	21	20	29	0	29	20
N.S.	1	1.00	1.26	0.68	0.65	0.94	0.00	0.94	0.65
time (sec)	N/A	0.016	0.035	0.020	0.508	0.365	0.000	4.826	3.589

Problem 661	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	36	19	18	29	0	29	18
N.S.	1	1.00	1.33	0.70	0.67	1.07	0.00	1.07	0.67
time (sec)	N/A	0.015	0.036	0.019	0.510	0.379	0.000	2.839	3.546

Problem 662	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	10	10	10	8	7	7	17	7	7
N.S.	1	1.00	1.00	0.80	0.70	0.70	1.70	0.70	0.70
time (sec)	N/A	0.086	0.024	0.022	0.574	0.359	0.044	2.621	0.067

Problem 663	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	13	17	11	11	24	11	16
N.S.	1	1.00	0.46	0.61	0.39	0.39	0.86	0.39	0.57
time (sec)	N/A	0.027	0.002	0.012	0.282	0.370	0.476	3.718	3.565

Problem 664	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	13	16	16	10	16	12
N.S.	1	1.00	1.00	0.81	1.00	1.00	0.62	1.00	0.75
time (sec)	N/A	0.016	0.026	0.017	0.279	0.352	0.315	4.819	3.770

Problem 665	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	16	15	15	15	16	15
N.S.	1	1.00	1.00	1.33	1.25	1.25	1.25	1.33	1.25
time (sec)	N/A	0.013	0.025	0.019	0.284	0.374	0.034	2.636	3.654

Problem 666	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	10	10	10	8	7	7	17	7	7
N.S.	1	1.00	1.00	0.80	0.70	0.70	1.70	0.70	0.70
time (sec)	N/A	0.013	0.156	0.020	0.518	0.346	0.037	6.455	0.057

Problem 667	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	22	0	9	18	8	18	-1
N.S.	1	1.00	1.57	0.00	0.64	1.29	0.57	1.29	-0.07
time (sec)	N/A	0.015	0.029	0.013	0.722	0.362	0.433	5.101	0.000

Problem 668	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	28	44	29	29	32	25	25
N.S.	1	1.00	0.80	1.26	0.83	0.83	0.91	0.71	0.71
time (sec)	N/A	0.130	0.044	0.053	0.337	0.391	0.336	4.625	3.591

Problem 669	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	11	11	9	8	8	7	8	8
N.S.	1	1.00	1.00	0.82	0.73	0.73	0.64	0.73	0.73
time (sec)	N/A	0.006	0.013	0.013	0.354	0.356	0.021	3.661	0.048

Problem 670	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	11	11	9	8	8	7	8	8
N.S.	1	1.00	1.00	0.82	0.73	0.73	0.64	0.73	0.73
time (sec)	N/A	0.010	0.011	0.013	0.374	0.403	0.023	2.294	3.513

Problem 671	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	9	9	9	7	6	6	7	6	6
N.S.	1	1.00	1.00	0.78	0.67	0.67	0.78	0.67	0.67
time (sec)	N/A	0.007	0.003	0.011	0.312	0.356	0.062	4.756	3.490

Problem 672	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	9	9	9	7	6	6	7	6	6
N.S.	1	1.00	1.00	0.78	0.67	0.67	0.78	0.67	0.67
time (sec)	N/A	0.007	0.003	0.010	0.273	0.371	0.109	6.517	3.571

Problem 673	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	34	51	59	31	31	31	31
N.S.	1	1.00	0.50	0.75	0.87	0.46	0.46	0.46	0.46
time (sec)	N/A	0.069	0.064	0.024	0.287	0.360	0.030	3.446	3.533

Problem 674	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	26	22	19	19	20	19	21
N.S.	1	1.00	0.93	0.79	0.68	0.68	0.71	0.68	0.75
time (sec)	N/A	0.016	0.026	0.015	0.287	0.477	0.027	3.585	3.499

Problem 675	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	23	20	19	18	22	18	18
N.S.	1	1.00	0.88	0.77	0.73	0.69	0.85	0.69	0.69
time (sec)	N/A	0.014	0.017	0.021	0.282	0.377	0.028	3.791	0.065

Problem 676	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	9	9	9	9	8	8	7	8	8
N.S.	1	1.00	1.00	1.00	0.89	0.89	0.78	0.89	0.89
time (sec)	N/A	0.016	0.002	0.014	0.288	0.357	0.017	3.243	0.060

Problem 677	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	20	22	17	21	20	17	17
N.S.	1	1.00	0.74	0.81	0.63	0.78	0.74	0.63	0.63
time (sec)	N/A	0.007	0.023	0.031	0.285	0.351	0.159	3.913	0.029

Problem 678	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	16	15	15	14	15	15
N.S.	1	1.00	1.00	0.94	0.88	0.88	0.82	0.88	0.88
time (sec)	N/A	0.021	0.026	0.025	0.313	0.363	0.041	4.634	3.543

Problem 679	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	11	10	10	8	10	10
N.S.	1	1.00	1.00	0.92	0.83	0.83	0.67	0.83	0.83
time (sec)	N/A	0.014	0.013	0.015	0.294	0.347	0.023	5.719	3.536

Problem 680	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	22	22	19	21	26	19	19
N.S.	1	1.00	0.81	0.81	0.70	0.78	0.96	0.70	0.70
time (sec)	N/A	0.007	0.023	0.030	0.288	0.363	0.084	3.558	0.031

Problem 681	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	5	5	5	5	4	16	0	6	6
N.S.	1	1.00	1.00	1.00	0.80	3.20	0.00	1.20	1.20
time (sec)	N/A	0.008	0.006	0.017	0.286	0.383	0.000	4.142	0.047

Problem 682	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	24	22	16	24	17	19	19
N.S.	1	1.00	1.14	1.05	0.76	1.14	0.81	0.90	0.90
time (sec)	N/A	0.018	0.021	0.015	0.288	0.353	0.030	5.650	0.070

Problem 683	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	22	22	19	21	24	19	19
N.S.	1	1.00	0.81	0.81	0.70	0.78	0.89	0.70	0.70
time (sec)	N/A	0.007	0.034	0.037	0.286	0.364	0.081	4.317	3.534

Problem 684	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	28	39	52	0	41	78
N.S.	1	1.00	1.00	0.82	1.15	1.53	0.00	1.21	2.29
time (sec)	N/A	0.022	0.013	0.144	0.292	0.359	0.000	3.559	5.530

Problem 685	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	20	23	16	18	14	16	10
N.S.	1	1.00	0.77	0.88	0.62	0.69	0.54	0.62	0.38
time (sec)	N/A	0.012	0.028	0.016	0.318	0.439	0.027	2.751	0.060

Problem 686	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	10	14	13	13	12	13	13
N.S.	1	1.00	0.67	0.93	0.87	0.87	0.80	0.87	0.87
time (sec)	N/A	0.020	0.023	0.022	0.289	0.439	0.039	2.274	3.488

Problem 687	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	22	18	17	14	22	17	14
N.S.	1	1.00	0.81	0.67	0.63	0.52	0.81	0.63	0.52
time (sec)	N/A	0.018	0.022	0.016	0.286	0.389	0.985	3.768	0.062

Problem 688	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	22	18	17	14	22	17	14
N.S.	1	1.00	0.81	0.67	0.63	0.52	0.81	0.63	0.52
time (sec)	N/A	0.017	0.021	0.016	0.315	0.414	1.143	4.714	3.535

Problem 689	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	56	50	48	62	0	49	49
N.S.	1	1.00	0.90	0.81	0.77	1.00	0.00	0.79	0.79
time (sec)	N/A	0.036	0.133	0.026	0.497	0.442	0.000	5.701	4.201

Problem 690	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	12	17	19	11	10	11	11
N.S.	1	1.00	0.63	0.89	1.00	0.58	0.53	0.58	0.58
time (sec)	N/A	0.030	0.015	0.013	0.287	0.395	0.023	4.681	3.457

Problem 691	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	19	24	28	16	15	16	16
N.S.	1	1.00	0.59	0.75	0.88	0.50	0.47	0.50	0.50
time (sec)	N/A	0.033	0.016	0.018	0.281	0.374	0.025	4.650	3.526

Problem 692	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	A	A	A	A	A	B
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	0	11	11	10	10	8	10	10
N.S.	1	0.00	1.00	1.00	0.91	0.91	0.73	0.91	0.91
time (sec)	N/A	0.098	0.025	0.017	0.357	0.367	0.151	5.525	3.594

Problem 693	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	9	9	9	7	6	6	5	6	6
N.S.	1	1.00	1.00	0.78	0.67	0.67	0.56	0.67	0.67
time (sec)	N/A	0.017	0.005	0.017	0.282	0.369	0.033	2.189	0.038

Problem 694	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	A	A	A	A	A	B
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	9	0	9	18	9	18	12	16	9
N.S.	1	0.00	1.00	2.00	1.00	2.00	1.33	1.78	1.00
time (sec)	N/A	0.051	0.011	0.013	0.330	0.355	0.064	2.703	3.584

Problem 695	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	26	24	21	21	22	21	21
N.S.	1	1.00	1.04	0.96	0.84	0.84	0.88	0.84	0.84
time (sec)	N/A	0.010	0.015	0.012	0.273	0.339	0.036	4.919	3.549

Problem 696	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	40	36	33	33	37	33	33
N.S.	1	1.00	1.00	0.90	0.82	0.82	0.92	0.82	0.82
time (sec)	N/A	0.013	0.019	0.015	0.296	0.354	0.048	5.830	0.072

Problem 697	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	53	48	45	45	51	45	45
N.S.	1	1.00	1.00	0.91	0.85	0.85	0.96	0.85	0.85
time (sec)	N/A	0.017	0.021	0.018	0.287	0.346	0.058	6.312	3.426

Problem 698	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	32	26	45	83	0	29	25
N.S.	1	1.00	1.00	0.81	1.41	2.59	0.00	0.91	0.78
time (sec)	N/A	0.020	0.035	0.026	0.508	0.376	0.000	5.733	3.618

Problem 699	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	28	27	85	0	27	31
N.S.	1	1.00	1.00	0.82	0.79	2.50	0.00	0.79	0.91
time (sec)	N/A	0.019	0.035	0.024	0.494	0.350	0.000	7.234	3.617

Problem 700	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	50	42	63	110	0	44	43
N.S.	1	1.00	0.94	0.79	1.19	2.08	0.00	0.83	0.81
time (sec)	N/A	0.023	0.040	0.027	0.514	0.377	0.000	3.718	3.515

Problem 701	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	54	46	47	117	0	45	47
N.S.	1	1.00	0.95	0.81	0.82	2.05	0.00	0.79	0.82
time (sec)	N/A	0.026	0.040	0.028	0.490	0.384	0.000	5.286	3.596

Problem 702	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	20	22	17	21	24	17	19
N.S.	1	1.00	0.74	0.81	0.63	0.78	0.89	0.63	0.70
time (sec)	N/A	0.007	0.021	0.030	0.280	0.356	0.084	5.584	0.030

Problem 703	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	10	10	10	9	8	8	19	8	8
N.S.	1	1.00	1.00	0.90	0.80	0.80	1.90	0.80	0.80
time (sec)	N/A	0.015	0.021	0.019	0.495	0.369	0.039	4.142	0.080

Problem 704	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	10	10	10	18	17	17	19	18	17
N.S.	1	1.00	1.00	1.80	1.70	1.70	1.90	1.80	1.70
time (sec)	N/A	0.015	0.026	0.018	0.299	0.358	0.040	6.143	0.099

Problem 705	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	15	14	10	0	21	-1
N.S.	1	1.00	1.00	0.83	0.78	0.56	0.00	1.17	-0.06
time (sec)	N/A	0.022	2.330	0.018	0.275	0.354	0.000	6.281	0.000

Problem 706	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	19	18	26	42	17	33	17
N.S.	1	1.00	0.95	0.90	1.30	2.10	0.85	1.65	0.85
time (sec)	N/A	0.027	0.046	0.020	0.516	0.335	0.043	4.587	0.388

Problem 707	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	24	33	21	21	20	21	21
N.S.	1	1.00	0.55	0.75	0.48	0.48	0.45	0.48	0.48
time (sec)	N/A	0.020	0.013	0.017	0.278	0.348	0.023	5.290	0.028

Problem 708	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	26	53	30	23	24	23	23
N.S.	1	1.00	0.50	1.02	0.58	0.44	0.46	0.44	0.44
time (sec)	N/A	0.026	0.023	0.020	0.292	0.335	0.025	6.478	0.054

Problem 709	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	45	23	22	35	32	22	22
N.S.	1	1.00	1.36	0.70	0.67	1.06	0.97	0.67	0.67
time (sec)	N/A	0.016	0.058	0.022	0.511	0.370	0.628	4.599	0.089

Problem 710	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	33	46	37	32	44	53	32
N.S.	1	1.00	0.66	0.92	0.74	0.64	0.88	1.06	0.64
time (sec)	N/A	0.023	0.028	0.017	0.284	0.361	1.560	3.715	3.573

Problem 711	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	48	62	61	50	61	75	38
N.S.	1	1.00	0.59	0.77	0.75	0.62	0.75	0.93	0.47
time (sec)	N/A	0.029	0.039	0.025	0.291	0.399	13.007	4.481	0.194

Problem 712	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	54	47	44	44	49	44	44
N.S.	1	1.00	0.98	0.85	0.80	0.80	0.89	0.80	0.80
time (sec)	N/A	0.057	0.032	0.032	0.279	0.394	0.050	4.679	3.567

Problem 713	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	55	27	26	43	39	26	26
N.S.	1	1.00	1.57	0.77	0.74	1.23	1.11	0.74	0.74
time (sec)	N/A	0.106	0.066	0.040	0.539	0.359	17.331	4.540	3.650

Problem 714	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	29	24	23	23	24	23	24
N.S.	1	1.00	0.91	0.75	0.72	0.72	0.75	0.72	0.75
time (sec)	N/A	0.141	0.047	0.025	0.286	0.355	0.054	3.211	3.607

Problem 715	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	5	5	5	4	3	3	3	3	3
N.S.	1	1.00	1.00	0.80	0.60	0.60	0.60	0.60	0.60
time (sec)	N/A	0.004	0.005	0.013	0.288	0.364	0.316	4.294	0.029

Problem 716	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	7	7	7	5	4	4	5	0	4
N.S.	1	1.00	1.00	0.71	0.57	0.57	0.71	0.00	0.57
time (sec)	N/A	0.012	0.009	0.016	0.299	0.372	0.471	0.000	3.462

Problem 717	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	23	17	16	19	17	24	8
N.S.	1	1.00	1.05	0.77	0.73	0.86	0.77	1.09	0.36
time (sec)	N/A	0.012	0.019	0.014	0.299	0.363	0.031	4.898	3.582

Problem 718	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	4	4	4	4	7	3	15	3	3
N.S.	1	1.00	1.00	1.00	1.75	0.75	3.75	0.75	0.75
time (sec)	N/A	0.007	0.002	0.016	0.521	0.357	0.033	5.939	0.019

Problem 719	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	11	10	10	10	10	12
N.S.	1	1.00	1.00	0.85	0.77	0.77	0.77	0.77	0.92
time (sec)	N/A	0.008	0.013	0.014	0.281	0.359	0.018	5.056	0.071

Problem 720	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	6	6	6	6	19	15	15	16	15
N.S.	1	1.00	1.00	1.00	3.17	2.50	2.50	2.67	2.50
time (sec)	N/A	0.007	0.002	0.010	0.283	0.388	0.034	5.443	0.055

Problem 721	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	11	11	10	10	10	10	12
N.S.	1	1.00	0.73	0.73	0.67	0.67	0.67	0.67	0.80
time (sec)	N/A	0.010	0.027	0.010	0.281	0.381	0.018	3.516	3.405

Problem 722	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	23	18	21	18	15	17	17
N.S.	1	1.00	1.05	0.82	0.95	0.82	0.68	0.77	0.77
time (sec)	N/A	0.019	0.022	0.018	0.291	0.364	0.037	3.755	0.055

Problem 723	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	30	25	24	25	26	30	22
N.S.	1	1.00	0.97	0.81	0.77	0.81	0.84	0.97	0.71
time (sec)	N/A	0.024	0.027	0.021	0.290	0.373	0.046	5.218	3.594

Problem 724	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	21	23	22	21	29	0	21
N.S.	1	1.00	0.95	1.05	1.00	0.95	1.32	0.00	0.95
time (sec)	N/A	0.020	0.066	0.021	0.532	0.420	0.126	0.000	3.477

Problem 725	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	23	34	40	25	39	0	-1
N.S.	1	1.00	0.68	1.00	1.18	0.74	1.15	0.00	-0.03
time (sec)	N/A	0.021	0.076	0.021	0.509	0.373	0.143	0.000	0.000

Problem 726	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	23	0	0	28	0	0	27
N.S.	1	1.00	1.00	0.00	0.00	1.22	0.00	0.00	1.17
time (sec)	N/A	0.032	0.167	0.023	0.000	0.375	0.000	0.000	3.415

Problem 727	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	41	51	74	35	54	35	50
N.S.	1	1.00	0.62	0.77	1.12	0.53	0.82	0.53	0.76
time (sec)	N/A	0.121	0.203	0.033	0.292	0.365	6.496	3.345	3.617

Problem 728	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	20	19	25	20	20	19
N.S.	1	1.00	1.00	1.67	1.58	2.08	1.67	1.67	1.58
time (sec)	N/A	0.009	0.029	0.019	0.295	0.387	0.039	6.280	0.064

Problem 729	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	13	13	0	11	8	54	11
N.S.	1	1.00	0.81	0.81	0.00	0.69	0.50	3.38	0.69
time (sec)	N/A	0.048	0.037	0.081	0.000	0.402	0.030	5.561	0.080

Problem 730	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	14	13	13	10	13	14
N.S.	1	1.00	1.00	0.88	0.81	0.81	0.62	0.81	0.88
time (sec)	N/A	0.036	0.078	0.072	0.287	0.346	0.027	6.018	3.482

Problem 731	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	33	23	74	33	0	33	-1
N.S.	1	1.00	1.00	0.70	2.24	1.00	0.00	1.00	-0.03
time (sec)	N/A	0.020	0.031	0.026	0.293	0.378	0.000	3.543	0.000

Problem 732	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	11	11	9	8	0	8	8	8
N.S.	1	1.00	1.00	0.82	0.73	0.00	0.73	0.73	0.73
time (sec)	N/A	0.017	0.015	0.018	0.286	0.000	0.057	6.126	3.501

Problem 733	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	6	6	6	6	5	5	5	5	5
N.S.	1	1.00	1.00	1.00	0.83	0.83	0.83	0.83	0.83
time (sec)	N/A	0.014	0.010	0.011	0.298	0.348	0.027	3.479	0.035

Problem 734	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	17	19	18	14	0	21
N.S.	1	1.00	1.00	0.89	1.00	0.95	0.74	0.00	1.11
time (sec)	N/A	0.011	0.017	0.021	0.315	0.354	0.138	0.000	3.601

Problem 735	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	15	18	36	15	12	20	15
N.S.	1	1.00	0.79	0.95	1.89	0.79	0.63	1.05	0.79
time (sec)	N/A	0.073	0.081	0.019	0.313	0.358	0.025	3.521	0.073

Problem 736	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	A	C	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	41	60	63	0	94	1392	62
N.S.	1	1.00	0.73	1.07	1.12	0.00	1.68	24.86	1.11
time (sec)	N/A	0.028	0.039	0.084	0.285	0.000	0.059	5.518	3.671

Problem 737	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	12	14	13	13	10	13	11
N.S.	1	1.00	0.80	0.93	0.87	0.87	0.67	0.87	0.73
time (sec)	N/A	0.007	0.028	0.019	0.291	0.355	0.027	4.128	3.500

Problem 738	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	12	12	11	10	11	11
N.S.	1	1.00	1.00	0.86	0.86	0.79	0.71	0.79	0.79
time (sec)	N/A	0.008	0.003	0.025	0.295	0.337	0.045	6.246	3.588

Problem 739	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	11	11	12	11	11	8	11	11
N.S.	1	1.00	1.00	1.09	1.00	1.00	0.73	1.00	1.00
time (sec)	N/A	0.007	0.002	0.019	0.284	0.378	0.032	4.618	3.499

Problem 740	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	21	20	17	17	20	17
N.S.	1	1.00	1.00	1.05	1.00	0.85	0.85	1.00	0.85
time (sec)	N/A	0.004	0.009	0.018	0.276	0.336	0.040	4.778	3.448

Problem 741	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	19	30	34	16	15	16	16
N.S.	1	1.00	0.59	0.94	1.06	0.50	0.47	0.50	0.50
time (sec)	N/A	0.029	0.048	0.022	0.282	0.361	0.025	4.953	0.050

Problem 742	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	33	28	27	40	36	27	26
N.S.	1	1.00	1.00	0.85	0.82	1.21	1.09	0.82	0.79
time (sec)	N/A	0.006	0.015	0.035	0.283	0.368	0.030	5.431	3.629

Problem 743	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	12	11	11	10	11	11
N.S.	1	1.00	1.00	0.57	0.52	0.52	0.48	0.52	0.52
time (sec)	N/A	0.007	0.003	0.026	0.301	0.350	0.046	5.037	3.494

Problem 744	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	11	11	9	8	0	0	0	8
N.S.	1	1.00	1.00	0.82	0.73	0.00	0.00	0.00	0.73
time (sec)	N/A	0.028	0.003	0.019	0.320	0.000	0.000	0.000	3.447

Problem 745	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	10	16	0	0	0	9
N.S.	1	1.00	1.00	0.83	1.33	0.00	0.00	0.00	0.75
time (sec)	N/A	0.178	0.082	0.026	0.330	0.000	0.000	0.000	3.629

Problem 746	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	10	9	0	0	0	9
N.S.	1	1.00	1.00	0.83	0.75	0.00	0.00	0.00	0.75
time (sec)	N/A	0.094	0.016	0.017	0.320	0.000	0.000	0.000	3.353

Problem 747	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.124	0.158	0.004	0.000	0.000	0.000	0.000	0.000

Problem 748	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.081	0.042	0.002	0.000	0.000	0.000	0.000	0.000

Problem 749	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	52	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.052	0.135	0.002	0.000	0.000	0.000	0.000	0.000

Problem 750	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	16	23	0	0	0	15
N.S.	1	1.00	1.00	0.80	1.15	0.00	0.00	0.00	0.75
time (sec)	N/A	0.404	0.212	0.027	0.323	0.000	0.000	0.000	3.694

Problem 751	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	67	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.112	0.361	0.003	0.000	0.000	0.000	0.000	0.000

Problem 752	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	9	8	0	12	8	8
N.S.	1	1.00	1.00	0.69	0.62	0.00	0.92	0.62	0.62
time (sec)	N/A	0.023	0.015	0.012	0.337	0.000	0.075	5.399	3.368

Problem 753	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	9	8	0	0	0	8
N.S.	1	1.00	1.00	0.69	0.62	0.00	0.00	0.00	0.62
time (sec)	N/A	0.047	0.002	0.018	0.338	0.000	0.000	0.000	3.379

Problem 754	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	38	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.027	0.045	0.003	0.000	0.000	0.000	0.000	0.000

Problem 755	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	10	16	0	0	0	9
N.S.	1	1.00	1.00	0.83	1.33	0.00	0.00	0.00	0.75
time (sec)	N/A	0.234	0.078	0.011	0.323	0.000	0.000	0.000	3.470

Problem 756	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	10	16	0	0	0	9
N.S.	1	1.00	1.00	0.83	1.33	0.00	0.00	0.00	0.75
time (sec)	N/A	0.095	0.017	0.022	0.318	0.000	0.000	0.000	3.639

Problem 757	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	23	24	27	22	28	22
N.S.	1	1.00	1.00	0.74	0.77	0.87	0.71	0.90	0.71
time (sec)	N/A	0.035	0.018	0.020	0.287	0.353	0.041	5.044	3.395

Problem 758	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	12	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.08
time (sec)	N/A	0.020	3.771	0.004	0.000	0.000	0.000	0.000	0.000

Problem 759	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	16	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.039	0.056	0.004	0.000	0.000	0.000	0.000	0.000

Problem 760	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	14	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.07
time (sec)	N/A	0.023	0.014	0.003	0.000	0.000	0.000	0.000	0.000

Problem 761	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	16	0	0	0	0	0	0	0	-1
N.S.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.027	0.057	0.003	0.000	0.000	0.000	0.000	0.000

Problem 762	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	36	37	59	47	85	47	-1
N.S.	1	1.00	1.00	1.03	1.64	1.31	2.36	1.31	-0.03
time (sec)	N/A	0.066	0.070	0.224	0.330	0.368	6.532	3.308	0.000

Problem 763	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	37	241	36	0	0	0	-1
N.S.	1	1.00	1.00	6.51	0.97	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.023	0.013	0.027	0.075	0.000	0.000	0.000	0.000

Problem 764	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	50	298	50	0	0	0	-1
N.S.	1	1.00	1.00	5.96	1.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.030	0.019	0.062	0.121	0.000	0.000	0.000	0.000

Problem 765	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	F	C	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	37	219	38	0	105	0	58
N.S.	1	1.00	1.00	5.92	1.03	0.00	2.84	0.00	1.57
time (sec)	N/A	0.012	0.007	0.027	0.074	0.000	0.688	0.000	3.750

Problem 766	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	41	267	42	0	0	0	71
N.S.	1	1.00	1.00	6.51	1.02	0.00	0.00	0.00	1.73
time (sec)	N/A	0.011	0.007	0.042	0.086	0.000	0.000	0.000	3.782

Problem 767	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	52	0	0	0	0	0	77
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.48
time (sec)	N/A	0.017	0.011	0.025	0.000	0.000	0.000	0.000	3.895

Problem 768	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	56	0	0	0	0	0	94
N.S.	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.68
time (sec)	N/A	0.017	0.011	0.033	0.000	0.000	0.000	0.000	4.007

Problem 769	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	74	0	0	89	0	0	-1
N.S.	1	1.00	0.92	0.00	0.00	1.11	0.00	0.00	-0.01
time (sec)	N/A	0.030	0.027	0.011	0.000	0.081	0.000	0.000	0.000

Problem 770	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	0	21	0	0	0	14
N.S.	1	1.00	1.00	0.00	1.24	0.00	0.00	0.00	0.82
time (sec)	N/A	0.433	0.544	0.005	0.308	0.000	0.000	0.000	3.674

2.3 Detailed conclusion table specific for Rubi results

The following table is specific to Rubi. It gives additional statistics for each integral. the column **steps** is the number of steps used by Rubi to obtain the antiderivative. The **rules** column is the number of unique rules used. The **integrand size** column is the leaf size of the integrand. Finally the ratio $\frac{\text{number of rules}}{\text{integrand size}}$ is given. The larger this ratio is, the harder the integral was to solve. In this test, problem number [544] had the largest ratio of [50]

Table 2.1: Rubi specific breakdown of results for each integral

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1	A	2	2	1.00	13	0.154
2	A	2	2	1.00	13	0.154
3	A	3	3	1.00	19	0.158
4	A	2	2	1.00	21	0.095
5	A	2	2	1.00	13	0.154
6	A	3	3	1.00	19	0.158
7	A	2	2	1.00	21	0.095
8	A	2	2	1.00	13	0.154
9	A	3	3	1.00	19	0.158
10	A	2	2	1.00	21	0.095
11	A	2	2	1.00	13	0.154
12	A	3	3	1.00	19	0.158
13	A	2	2	1.00	21	0.095
14	A	2	2	1.00	17	0.118
15	A	3	3	1.00	17	0.176
16	A	2	2	1.00	29	0.069
17	A	3	3	1.00	44	0.068
18	A	3	2	1.00	15	0.133
19	A	3	2	1.00	15	0.133
20	A	2	2	1.00	15	0.133
21	A	3	2	1.00	15	0.133
22	A	3	2	1.00	17	0.118
23	A	3	2	1.00	17	0.118
24	A	2	2	1.00	17	0.118
25	A	3	2	1.00	17	0.118

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
26	A	3	2	1.00	19	0.105
27	A	3	2	1.00	16	0.125
28	A	3	2	1.00	18	0.111
29	A	3	2	1.00	18	0.111
30	A	3	2	1.00	18	0.111
31	A	3	2	1.00	18	0.111
32	A	3	2	1.00	18	0.111
33	A	2	2	1.00	22	0.091
34	A	3	3	1.00	23	0.130
35	A	3	3	1.00	23	0.130
36	A	3	2	1.00	23	0.087
37	A	4	3	1.00	23	0.130
38	A	2	2	1.00	13	0.154
39	A	2	2	1.00	15	0.133
40	A	3	5	1.00	16	0.312
41	A	8	7	1.00	18	0.389
42	A	10	8	1.00	18	0.444
43	A	2	2	1.00	15	0.133
44	A	6	7	1.00	16	0.438
45	A	9	8	1.00	18	0.444
46	A	11	9	1.00	18	0.500
47	A	3	3	1.00	15	0.200
48	A	8	7	1.00	16	0.438
49	A	16	12	1.00	18	0.667
50	A	21	11	1.00	18	0.611
51	A	4	3	1.00	15	0.200
52	A	11	7	1.00	16	0.438
53	A	24	12	1.00	18	0.667
54	A	2	2	1.00	15	0.133
55	A	6	6	1.00	17	0.353
56	A	9	7	1.00	19	0.368
57	A	11	8	1.00	19	0.421
58	A	2	2	1.00	15	0.133
59	A	6	6	1.00	17	0.353
60	A	6	6	1.00	19	0.316

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
61	A	7	7	1.00	19	0.368
62	A	4	4	1.00	15	0.267
63	A	22	9	1.00	17	0.529
64	A	43	14	1.00	19	0.737
65	A	3	3	1.00	25	0.120
66	A	2	2	1.00	25	0.080
67	A	2	2	1.00	34	0.059
68	A	2	2	1.00	34	0.059
69	A	1	1	1.00	13	0.077
70	A	1	1	1.00	13	0.077
71	A	1	1	1.00	13	0.077
72	A	4	2	1.00	13	0.154
73	A	3	2	1.00	13	0.154
74	A	2	2	1.00	13	0.154
75	A	1	1	1.00	11	0.091
76	A	1	1	1.00	13	0.077
77	A	2	2	1.00	13	0.154
78	A	3	2	1.00	13	0.154
79	A	4	2	1.00	13	0.154
80	A	1	1	1.00	13	0.077
81	A	1	1	1.00	13	0.077
82	A	1	1	1.00	13	0.077
83	A	1	1	1.00	13	0.077
84	A	5	2	1.00	13	0.154
85	A	4	2	1.00	13	0.154
86	A	3	2	1.00	13	0.154
87	A	2	2	1.00	13	0.154
88	A	1	1	1.00	9	0.111
89	A	2	2	1.00	13	0.154
90	A	3	2	1.00	13	0.154
91	A	4	2	1.00	13	0.154
92	A	5	2	1.00	13	0.154
93	A	1	1	1.00	13	0.077
94	A	1	1	1.00	13	0.077
95	A	1	1	1.00	13	0.077

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
96	A	1	1	1.00	13	0.077
97	A	1	1	1.00	13	0.077
98	A	4	2	1.00	13	0.154
99	A	3	2	1.00	13	0.154
100	A	2	2	1.00	13	0.154
101	A	1	1	1.00	13	0.077
102	A	1	1	1.00	13	0.077
103	A	2	2	1.00	13	0.154
104	A	3	2	1.00	13	0.154
105	A	4	2	1.00	13	0.154
106	A	1	1	1.00	13	0.077
107	A	1	1	1.00	13	0.077
108	A	1	1	1.00	13	0.077
109	A	1	1	1.00	13	0.077
110	A	1	1	1.00	11	0.091
111	A	1	1	1.00	9	0.111
112	A	1	1	1.00	13	0.077
113	A	1	1	1.00	13	0.077
114	A	1	1	1.00	11	0.091
115	A	1	1	1.00	13	0.077
116	A	1	1	1.00	13	0.077
117	A	1	1	1.00	13	0.077
118	A	4	3	1.00	13	0.231
119	A	3	3	1.00	11	0.273
120	A	2	2	1.00	9	0.222
121	A	1	1	1.00	13	0.077
122	A	1	1	1.00	13	0.077
123	A	2	2	1.00	13	0.154
124	A	3	2	1.00	13	0.154
125	A	4	2	1.00	13	0.154
126	A	1	1	1.00	13	0.077
127	A	1	1	1.00	13	0.077
128	A	1	1	1.00	13	0.077
129	A	1	1	1.00	13	0.077
130	A	1	1	1.00	13	0.077

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
131	A	4	2	1.00	13	0.154
132	A	3	2	1.00	13	0.154
133	A	2	2	1.00	11	0.182
134	A	1	1	1.00	13	0.077
135	A	1	1	1.00	13	0.077
136	A	2	2	1.00	13	0.154
137	A	3	2	1.00	13	0.154
138	A	4	2	1.00	13	0.154
139	A	1	1	1.00	13	0.077
140	A	1	1	1.00	13	0.077
141	A	1	1	1.00	13	0.077
142	A	1	1	1.00	13	0.077
143	A	6	4	1.00	13	0.308
144	A	5	4	1.00	13	0.308
145	A	4	4	1.00	13	0.308
146	A	3	3	1.00	9	0.333
147	A	2	2	1.00	13	0.154
148	A	3	3	1.00	13	0.231
149	A	4	3	1.00	13	0.231
150	A	5	3	1.00	13	0.231
151	A	6	3	1.00	13	0.231
152	A	1	1	1.00	13	0.077
153	A	1	1	1.00	13	0.077
154	A	1	1	1.00	13	0.077
155	A	1	1	1.00	13	0.077
156	A	1	1	1.00	13	0.077
157	A	4	2	1.00	13	0.154
158	A	3	2	1.00	13	0.154
159	A	2	2	1.00	13	0.154
160	A	1	1	1.00	13	0.077
161	A	1	1	1.00	13	0.077
162	A	2	2	1.00	13	0.154
163	A	3	2	1.00	13	0.154
164	A	4	2	1.00	13	0.154
165	A	1	1	1.00	13	0.077

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
166	A	1	1	1.00	13	0.077
167	A	1	1	1.00	13	0.077
168	A	1	1	1.00	13	0.077
169	A	1	1	1.00	11	0.091
170	A	1	1	1.00	9	0.111
171	A	1	1	1.00	13	0.077
172	A	1	1	1.00	13	0.077
173	A	1	1	1.00	13	0.077
174	A	1	1	1.00	13	0.077
175	A	1	1	1.00	13	0.077
176	A	1	1	1.00	13	0.077
177	A	1	1	1.00	11	0.091
178	A	1	1	1.00	9	0.111
179	A	1	1	1.00	13	0.077
180	A	1	1	1.00	13	0.077
181	A	1	1	1.00	13	0.077
182	A	1	1	1.00	13	0.077
183	A	3	2	1.00	17	0.118
184	A	2	2	1.00	17	0.118
185	A	1	1	1.00	15	0.067
186	A	1	1	1.00	13	0.077
187	A	2	2	1.00	17	0.118
188	A	3	2	1.00	17	0.118
189	A	4	3	1.00	19	0.158
190	A	3	3	1.00	19	0.158
191	A	2	2	1.00	19	0.105
192	A	3	3	1.00	19	0.158
193	A	4	3	1.00	19	0.158
194	A	2	2	1.00	7	0.286
195	A	8	4	1.00	15	0.267
196	A	6	4	1.00	15	0.267
197	A	4	3	1.00	13	0.231
198	A	1	1	1.00	11	0.091
199	A	0	0	0.00	0	0.000
200	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
201	A	0	0	0.00	0	0.000
202	A	5	4	1.00	15	0.267
203	A	4	3	1.00	13	0.231
204	A	1	1	1.00	11	0.091
205	A	0	0	0.00	0	0.000
206	A	0	0	0.00	0	0.000
207	A	0	0	0.00	0	0.000
208	A	8	5	1.00	33	0.152
209	A	7	5	1.00	33	0.152
210	A	6	5	1.00	33	0.152
211	A	5	4	1.00	31	0.129
212	A	2	2	1.00	29	0.069
213	A	0	0	0.00	0	0.000
214	A	0	0	0.00	0	0.000
215	A	3	3	1.00	11	0.273
216	A	13	5	1.00	15	0.333
217	A	12	5	1.00	15	0.333
218	A	11	4	1.00	15	0.267
219	A	7	4	1.00	13	0.308
220	A	2	2	1.00	11	0.182
221	A	4	4	1.00	15	0.267
222	A	9	7	1.00	15	0.467
223	A	18	7	1.00	15	0.467
224	A	19	6	1.00	15	0.400
225	A	14	6	1.00	15	0.400
226	A	11	6	1.00	15	0.400
227	A	7	6	1.00	13	0.462
228	A	3	3	1.00	11	0.273
229	A	0	0	0.00	0	0.000
230	A	0	0	0.00	0	0.000
231	A	0	0	0.00	0	0.000
232	A	8	5	1.00	15	0.333
233	A	7	5	1.00	15	0.333
234	A	6	5	1.00	15	0.333
235	A	4	3	1.00	13	0.231

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
236	A	1	1	1.00	11	0.091
237	A	0	0	0.00	0	0.000
238	A	0	0	0.00	0	0.000
239	A	0	0	0.00	0	0.000
240	A	0	0	0.00	0	0.000
241	A	0	0	0.00	0	0.000
242	A	1	1	1.00	13	0.077
243	A	0	0	0.00	0	0.000
244	A	0	0	0.00	0	0.000
245	A	0	0	0.00	0	0.000
246	A	0	0	0.00	0	0.000
247	A	6	3	1.00	15	0.200
248	A	5	3	1.00	15	0.200
249	A	4	3	1.00	13	0.231
250	A	1	1	1.00	11	0.091
251	A	0	0	0.00	0	0.000
252	A	0	0	0.00	0	0.000
253	A	0	0	0.00	0	0.000
254	A	1	1	1.00	21	0.048
255	A	1	1	1.00	21	0.048
256	A	1	1	1.00	21	0.048
257	A	4	2	1.00	21	0.095
258	A	3	2	1.00	21	0.095
259	A	2	2	1.00	21	0.095
260	A	1	1	1.00	19	0.053
261	A	1	1	1.00	21	0.048
262	A	2	2	1.00	21	0.095
263	A	3	2	1.00	21	0.095
264	A	4	2	1.00	21	0.095
265	A	1	1	1.00	21	0.048
266	A	1	1	1.00	21	0.048
267	A	1	1	1.00	21	0.048
268	A	1	1	1.00	21	0.048
269	A	5	2	1.00	21	0.095
270	A	4	2	1.00	21	0.095

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
271	A	3	2	1.00	21	0.095
272	A	2	2	1.00	21	0.095
273	A	1	1	1.00	13	0.077
274	A	2	2	1.00	21	0.095
275	A	3	2	1.00	21	0.095
276	A	4	2	1.00	21	0.095
277	A	5	2	1.00	21	0.095
278	A	1	1	1.00	21	0.048
279	A	1	1	1.00	21	0.048
280	A	1	1	1.00	21	0.048
281	A	1	1	1.00	21	0.048
282	A	1	1	1.00	21	0.048
283	A	4	2	1.00	21	0.095
284	A	3	2	1.00	21	0.095
285	A	2	2	1.00	21	0.095
286	A	1	1	1.00	21	0.048
287	A	1	1	1.00	21	0.048
288	A	2	2	1.00	21	0.095
289	A	3	2	1.00	21	0.095
290	A	4	2	1.00	21	0.095
291	A	1	1	1.00	21	0.048
292	A	1	1	1.00	21	0.048
293	A	1	1	1.00	21	0.048
294	A	1	1	1.00	19	0.053
295	A	1	1	1.00	13	0.077
296	A	1	1	1.00	21	0.048
297	A	1	1	1.00	21	0.048
298	A	1	1	1.00	21	0.048
299	A	3	3	1.00	15	0.200
300	A	4	3	1.00	15	0.200
301	A	1	1	1.00	21	0.048
302	A	1	1	1.00	21	0.048
303	A	1	1	1.00	21	0.048
304	A	4	3	1.00	21	0.143
305	A	3	3	1.00	19	0.158

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
306	A	2	2	1.00	13	0.154
307	A	1	1	1.00	21	0.048
308	A	1	1	1.00	21	0.048
309	A	2	2	1.00	21	0.095
310	A	3	2	1.00	21	0.095
311	A	4	2	1.00	21	0.095
312	A	1	1	1.00	21	0.048
313	A	1	1	1.00	21	0.048
314	A	1	1	1.00	21	0.048
315	A	1	1	1.00	21	0.048
316	A	1	1	1.00	21	0.048
317	A	4	2	1.00	21	0.095
318	A	3	2	1.00	21	0.095
319	A	2	2	1.00	19	0.105
320	A	1	1	1.00	21	0.048
321	A	1	1	1.00	21	0.048
322	A	2	2	1.00	21	0.095
323	A	3	2	1.00	21	0.095
324	A	4	2	1.00	21	0.095
325	A	1	1	1.00	21	0.048
326	A	1	1	1.00	21	0.048
327	A	1	1	1.00	21	0.048
328	A	1	1	1.00	21	0.048
329	A	6	4	1.00	21	0.190
330	A	5	4	1.00	21	0.190
331	A	4	4	1.00	21	0.190
332	A	3	3	1.00	13	0.231
333	A	2	2	1.00	21	0.095
334	A	3	3	1.00	21	0.143
335	A	4	3	1.00	21	0.143
336	A	5	3	1.00	21	0.143
337	A	6	3	1.00	21	0.143
338	A	1	1	1.00	21	0.048
339	A	1	1	1.00	21	0.048
340	A	1	1	1.00	21	0.048

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
341	A	1	1	1.00	21	0.048
342	A	1	1	1.00	21	0.048
343	A	4	2	1.00	21	0.095
344	A	3	2	1.00	21	0.095
345	A	2	2	1.00	21	0.095
346	A	1	1	1.00	21	0.048
347	A	1	1	1.00	21	0.048
348	A	2	2	1.00	21	0.095
349	A	3	2	1.00	21	0.095
350	A	4	2	1.00	21	0.095
351	A	1	1	1.00	21	0.048
352	A	1	1	1.00	21	0.048
353	A	1	1	1.00	21	0.048
354	A	1	1	1.00	19	0.053
355	A	1	1	1.00	13	0.077
356	A	1	1	1.00	21	0.048
357	A	1	1	1.00	21	0.048
358	A	1	1	1.00	21	0.048
359	A	1	1	1.00	21	0.048
360	A	1	1	1.00	21	0.048
361	A	1	1	1.00	21	0.048
362	A	1	1	1.00	19	0.053
363	A	1	1	1.00	13	0.077
364	A	1	1	1.00	21	0.048
365	A	1	1	1.00	21	0.048
366	A	1	1	1.00	21	0.048
367	A	1	1	1.00	21	0.048
368	A	1	1	1.00	25	0.040
369	A	1	1	1.00	25	0.040
370	A	4	2	1.00	25	0.080
371	A	3	2	1.00	25	0.080
372	A	2	2	1.00	25	0.080
373	A	1	1	1.00	23	0.043
374	A	1	1	1.00	21	0.048
375	A	2	2	1.00	25	0.080

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
376	A	3	2	1.00	25	0.080
377	A	4	2	1.00	25	0.080
378	A	1	1	1.00	25	0.040
379	A	1	1	1.00	25	0.040
380	A	2	2	1.00	25	0.080
381	A	2	2	1.00	26	0.077
382	A	14	4	1.00	21	0.190
383	A	11	4	1.00	21	0.190
384	A	8	4	1.00	21	0.190
385	A	6	4	1.00	21	0.190
386	A	4	3	1.00	19	0.158
387	A	1	1	1.00	13	0.077
388	A	0	0	0.00	0	0.000
389	A	0	0	0.00	0	0.000
390	A	0	0	0.00	0	0.000
391	A	6	4	1.00	19	0.210
392	A	5	4	1.00	19	0.210
393	A	4	3	1.00	17	0.176
394	A	1	1	1.00	11	0.091
395	A	0	0	0.00	0	0.000
396	A	0	0	0.00	0	0.000
397	A	4	4	1.00	21	0.190
398	A	9	7	1.00	21	0.333
399	A	18	7	1.00	21	0.333
400	A	36	7	1.00	21	0.333
401	A	13	5	1.00	19	0.263
402	A	12	5	1.00	19	0.263
403	A	11	4	1.00	19	0.210
404	A	7	4	1.00	17	0.235
405	A	2	2	1.00	11	0.182
406	A	4	4	1.00	19	0.210
407	A	9	7	1.00	19	0.368
408	A	18	7	1.00	19	0.368
409	A	14	6	1.00	19	0.316
410	A	11	6	1.00	19	0.316

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
411	A	7	6	1.00	17	0.353
412	A	3	3	1.00	11	0.273
413	A	0	0	0.00	0	0.000
414	A	0	0	0.00	0	0.000
415	A	0	0	0.00	0	0.000
416	A	7	5	1.00	19	0.263
417	A	6	5	1.00	19	0.263
418	A	4	3	1.00	17	0.176
419	A	1	1	1.00	11	0.091
420	A	0	0	0.00	0	0.000
421	A	0	0	0.00	0	0.000
422	A	5	5	1.00	26	0.192
423	A	12	8	1.00	26	0.308
424	A	24	8	1.00	26	0.308
425	A	48	8	1.00	26	0.308
426	A	10	4	1.00	16	0.250
427	A	6	4	1.00	16	0.250
428	A	3	3	1.00	14	0.214
429	A	2	2	1.00	12	0.167
430	A	0	0	0.00	0	0.000
431	A	0	0	0.00	0	0.000
432	A	10	4	1.00	17	0.235
433	A	6	4	1.00	17	0.235
434	A	3	3	1.00	15	0.200
435	A	2	2	1.00	13	0.154
436	A	0	0	0.00	0	0.000
437	A	0	0	0.00	0	0.000
438	A	11	5	1.00	17	0.294
439	A	7	5	1.00	17	0.294
440	A	4	4	1.00	15	0.267
441	A	3	3	1.00	13	0.231
442	A	0	0	0.00	0	0.000
443	A	0	0	0.00	0	0.000
444	A	10	4	1.00	20	0.200
445	A	6	4	1.00	20	0.200

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
446	A	3	3	1.00	18	0.167
447	A	0	0	0.00	0	0.000
448	A	0	0	0.00	0	0.000
449	A	0	0	0.00	0	0.000
450	A	2	2	1.00	21	0.095
451	A	3	3	1.00	21	0.143
452	A	1	1	1.00	19	0.053
453	A	1	1	1.00	21	0.048
454	A	3	3	1.00	21	0.143
455	A	2	2	1.00	21	0.095
456	A	2	2	1.00	20	0.100
457	A	3	3	1.00	20	0.150
458	A	1	1	1.00	18	0.056
459	A	1	1	1.00	20	0.050
460	A	3	3	1.00	20	0.150
461	A	2	2	1.00	20	0.100
462	A	8	4	1.00	20	0.200
463	A	7	2	1.00	20	0.100
464	A	4	2	1.00	17	0.118
465	A	4	2	1.00	18	0.111
466	A	7	4	1.00	20	0.200
467	A	9	3	1.00	23	0.130
468	A	7	2	1.00	23	0.087
469	A	4	2	1.00	20	0.100
470	A	4	2	1.00	21	0.095
471	A	7	3	1.00	23	0.130
472	A	9	4	1.00	23	0.174
473	A	3	2	1.00	13	0.154
474	A	3	2	1.00	15	0.133
475	A	3	2	1.00	14	0.143
476	A	3	2	1.00	16	0.125
477	A	3	2	1.00	15	0.133
478	A	3	2	1.00	17	0.118
479	A	3	2	1.00	16	0.125
480	A	3	2	1.00	18	0.111

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
481	A	2	2	1.00	13	0.154
482	A	2	2	1.00	15	0.133
483	A	2	2	1.00	14	0.143
484	A	2	2	1.00	16	0.125
485	A	4	4	1.00	15	0.267
486	A	4	4	1.00	15	0.267
487	A	4	4	1.00	16	0.250
488	A	4	4	1.00	16	0.250
489	A	3	3	1.00	15	0.200
490	A	3	3	1.00	17	0.176
491	A	3	3	1.00	16	0.188
492	A	3	3	1.00	18	0.167
493	A	2	2	1.00	17	0.118
494	A	2	2	1.00	17	0.118
495	A	2	2	1.00	18	0.111
496	A	2	2	1.00	18	0.111
497	A	3	2	1.00	15	0.133
498	A	3	2	1.00	17	0.118
499	A	3	2	1.00	16	0.125
500	A	3	2	1.00	18	0.111
501	A	5	4	1.00	17	0.235
502	A	5	4	1.00	19	0.210
503	A	5	4	1.00	18	0.222
504	A	5	4	1.00	20	0.200
505	A	3	2	1.00	14	0.143
506	A	6	5	1.00	14	0.357
507	A	6	5	1.00	12	0.417
508	A	7	7	1.00	14	0.500
509	A	7	7	1.00	16	0.438
510	A	11	11	1.00	16	0.688
511	A	9	5	1.00	16	0.312
512	A	9	5	1.00	14	0.357
513	A	9	5	1.00	16	0.312
514	A	9	5	1.00	18	0.278
515	A	12	10	1.00	18	0.556

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
516	A	11	6	1.00	18	0.333
517	A	11	6	1.00	16	0.375
518	A	11	6	1.00	18	0.333
519	A	11	6	1.00	20	0.300
520	A	3	2	1.00	23	0.087
521	A	7	7	1.00	25	0.280
522	A	7	7	1.00	24	0.292
523	A	11	11	1.00	25	0.440
524	A	9	5	1.00	27	0.185
525	A	12	10	1.00	27	0.370
526	A	11	6	1.00	29	0.207
527	A	7	6	1.00	37	0.162
528	A	7	6	1.00	36	0.167
529	A	2	2	1.00	12	0.167
530	A	7	7	1.00	14	0.500
531	A	7	7	1.00	16	0.438
532	A	2	2	1.00	21	0.095
533	A	7	7	1.00	23	0.304
534	A	7	7	1.00	25	0.280
535	A	2	2	1.00	12	0.167
536	A	4	3	1.00	16	0.188
537	A	4	4	1.00	16	0.250
538	A	8	5	1.00	18	0.278
539	A	10	6	1.00	20	0.300
540	A	4	4	1.00	25	0.160
541	A	8	5	1.00	27	0.185
542	A	10	6	1.00	29	0.207
543	A	0	0	0.00	0	0.000
544	A	6	3	1.00	50	0.060
545	A	5	3	1.00	50	0.060
546	A	4	3	1.00	48	0.062
547	A	3	2	1.00	21	0.095
548	A	0	0	0.00	0	0.000
549	A	0	0	0.00	0	0.000
550	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
551	A	6	3	1.00	47	0.064
552	A	5	3	1.00	47	0.064
553	A	4	3	1.00	45	0.067
554	A	1	1	1.00	14	0.071
555	A	0	0	0.00	0	0.000
556	A	0	0	0.00	0	0.000
557	A	3	3	1.00	37	0.081
558	A	2	2	1.00	36	0.056
559	A	2	2	1.00	36	0.056
560	A	2	2	1.00	35	0.057
561	A	2	2	1.00	36	0.056
562	A	2	2	1.00	36	0.056
563	A	4	3	1.00	10	0.300
564	A	3	3	1.00	8	0.375
565	A	2	2	1.00	7	0.286
566	A	2	2	1.00	10	0.200
567	A	3	3	1.00	10	0.300
568	A	4	3	1.00	10	0.300
569	A	3	2	1.00	10	0.200
570	A	2	2	1.00	9	0.222
571	A	4	3	1.00	12	0.250
572	A	13	7	1.00	44	0.159
573	A	11	6	1.00	44	0.136
574	A	9	5	1.00	42	0.119
575	A	7	6	1.00	37	0.162
576	A	0	0	0.00	0	0.000
577	A	0	0	0.00	0	0.000
578	A	9	5	1.00	47	0.106
579	A	4	4	1.00	18	0.222
580	A	4	4	1.00	16	0.250
581	A	4	4	1.00	14	0.286
582	A	4	4	1.00	18	0.222
583	A	4	4	1.00	18	0.222
584	A	4	4	1.00	18	0.222
585	A	4	4	1.00	20	0.200

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
586	A	3	3	1.00	20	0.150
587	A	3	3	1.00	31	0.097
588	A	3	3	1.00	31	0.097
589	A	3	3	1.00	29	0.103
590	A	3	3	1.00	20	0.150
591	A	2	2	1.00	31	0.065
592	A	3	3	1.00	31	0.097
593	A	3	3	1.00	31	0.097
594	A	0	0	0.00	0	0.000
595	A	14	5	1.00	28	0.179
596	A	11	5	1.00	28	0.179
597	A	8	5	1.00	26	0.192
598	A	3	3	1.00	20	0.150
599	A	0	0	0.00	0	0.000
600	A	0	0	0.00	0	0.000
601	A	0	0	0.00	0	0.000
602	A	4	4	1.00	31	0.129
603	A	4	4	1.00	31	0.129
604	A	4	4	1.00	29	0.138
605	A	4	4	1.00	20	0.200
606	A	4	4	1.00	31	0.129
607	A	4	4	1.00	31	0.129
608	A	4	4	1.00	31	0.129
609	A	0	0	0.00	0	0.000
610	A	18	6	1.00	28	0.214
611	A	14	6	1.00	28	0.214
612	A	10	6	1.00	26	0.231
613	A	4	4	1.00	20	0.200
614	A	0	0	0.00	0	0.000
615	A	0	0	0.00	0	0.000
616	A	0	0	0.00	0	0.000
617	A	1	1	1.00	21	0.048
618	A	1	1	1.00	33	0.030
619	A	2	2	1.00	31	0.065
620	A	5	3	1.00	31	0.097

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
621	A	4	3	1.00	31	0.097
622	A	3	3	1.00	29	0.103
623	A	1	1	1.00	19	0.053
624	A	2	2	1.00	31	0.065
625	A	3	3	1.00	31	0.097
626	A	4	3	1.00	31	0.097
627	A	7	4	1.00	33	0.121
628	A	6	4	1.00	33	0.121
629	A	5	4	1.00	33	0.121
630	A	4	4	1.00	33	0.121
631	A	3	3	1.00	33	0.091
632	A	4	4	1.00	33	0.121
633	A	5	4	1.00	33	0.121
634	A	6	4	1.00	33	0.121
635	A	7	4	1.00	33	0.121
636	A	2	2	1.00	19	0.105
637	A	2	2	1.00	13	0.154
638	A	2	2	1.00	15	0.133
639	A	2	2	1.00	15	0.133
640	A	3	3	1.00	17	0.176
641	A	2	2	1.00	9	0.222
642	A	3	3	1.00	17	0.176
643	A	3	3	1.00	18	0.167
644	A	2	2	1.00	13	0.154
645	A	1	1	1.00	11	0.091
646	A	2	1	1.00	9	0.111
647	A	3	2	1.00	17	0.118
648	A	2	2	1.00	17	0.118
649	A	2	2	1.00	15	0.133
650	A	3	2	1.00	13	0.154
651	A	3	2	1.00	16	0.125
652	A	2	2	1.00	13	0.154
653	A	2	2	1.00	13	0.154
654	A	4	3	1.17	23	0.130
655	A	4	3	1.20	23	0.130

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
656	A	4	3	1.00	27	0.111
657	A	2	2	1.00	15	0.133
658	A	1	1	1.00	17	0.059
659	A	4	4	1.00	15	0.267
660	A	3	3	1.00	15	0.200
661	A	3	3	1.00	15	0.200
662	A	3	3	1.00	18	0.167
663	A	3	3	1.00	11	0.273
664	A	3	3	1.00	15	0.200
665	A	2	2	1.00	15	0.133
666	A	2	2	1.00	15	0.133
667	A	2	2	1.00	17	0.118
668	A	2	2	1.00	17	0.118
669	A	1	1	1.00	9	0.111
670	A	1	1	1.00	11	0.091
671	A	1	1	1.00	13	0.077
672	A	1	1	1.00	13	0.077
673	A	13	3	1.00	16	0.188
674	A	5	3	1.00	7	0.429
675	A	3	2	1.00	20	0.100
676	A	2	2	1.00	18	0.111
677	A	1	1	1.00	10	0.100
678	A	4	3	1.00	20	0.150
679	A	3	2	1.00	13	0.154
680	A	1	1	1.00	10	0.100
681	A	2	2	1.00	8	0.250
682	A	3	2	1.00	15	0.133
683	A	1	1	1.00	10	0.100
684	A	3	3	1.00	14	0.214
685	A	6	3	1.00	11	0.273
686	A	4	3	1.00	18	0.167
687	A	3	2	1.00	15	0.133
688	A	3	2	1.00	15	0.133
689	A	4	4	1.00	32	0.125
690	A	8	4	1.00	11	0.364

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
691	A	8	4	1.00	13	0.308
692	F	0	0	N/A	0.	N/A
693	A	2	2	1.00	23	0.087
694	F	0	0	N/A	0.	N/A
695	A	3	2	1.00	9	0.222
696	A	3	2	1.00	9	0.222
697	A	3	2	1.00	9	0.222
698	A	3	3	1.00	15	0.200
699	A	3	3	1.00	17	0.176
700	A	4	4	1.00	15	0.267
701	A	4	4	1.00	17	0.235
702	A	1	1	1.00	10	0.100
703	A	3	3	1.00	15	0.200
704	A	3	3	1.00	15	0.200
705	A	2	2	1.00	17	0.118
706	A	3	3	1.00	18	0.167
707	A	4	2	1.00	9	0.222
708	A	4	2	1.00	11	0.182
709	A	3	3	1.00	17	0.176
710	A	3	2	1.00	19	0.105
711	A	3	2	1.00	17	0.118
712	A	4	3	1.00	15	0.200
713	A	4	4	1.00	22	0.182
714	A	4	3	1.00	22	0.136
715	A	2	2	1.00	7	0.286
716	A	3	2	1.00	12	0.167
717	A	4	3	1.00	11	0.273
718	A	2	2	1.00	11	0.182
719	A	2	2	1.00	11	0.182
720	A	2	2	1.00	13	0.154
721	A	2	2	1.00	13	0.154
722	A	3	2	1.00	17	0.118
723	A	4	3	1.00	17	0.176
724	A	3	2	1.00	13	0.154
725	A	3	2	1.00	15	0.133

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
726	A	3	2	1.00	25	0.080
727	A	15	4	1.00	18	0.222
728	A	3	3	1.00	13	0.231
729	A	6	4	1.00	15	0.267
730	A	1	1	1.00	16	0.062
731	A	3	3	1.00	19	0.158
732	A	1	1	1.00	15	0.067
733	A	1	1	1.00	13	0.077
734	A	2	2	1.00	9	0.222
735	A	6	4	1.00	16	0.250
736	A	3	2	1.00	15	0.133
737	A	1	1	1.00	9	0.111
738	A	1	1	1.00	13	0.077
739	A	1	1	1.00	9	0.111
740	A	3	1	1.00	9	0.111
741	A	8	3	1.00	14	0.214
742	A	2	1	1.00	15	0.067
743	A	1	1	1.00	13	0.077
744	A	2	1	1.00	23	0.043
745	A	6	3	1.00	28	0.107
746	A	4	2	1.00	37	0.054
747	A	0	0	0.00	0	0.000
748	A	0	0	0.00	0	0.000
749	A	0	0	0.00	0	0.000
750	A	4	2	1.00	50	0.040
751	A	0	0	0.00	0	0.000
752	A	1	1	1.00	16	0.062
753	A	2	1	1.00	34	0.029
754	A	0	0	0.00	0	0.000
755	A	8	4	1.00	23	0.174
756	A	4	2	1.00	39	0.051
757	A	3	2	1.00	26	0.077
758	A	0	0	0.00	0	0.000
759	A	0	0	0.00	0	0.000
760	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
761	A	0	0	0.00	0	0.000
762	A	4	3	1.00	23	0.130
763	A	2	2	1.00	15	0.133
764	A	2	2	1.00	19	0.105
765	A	1	1	1.00	9	0.111
766	A	1	1	1.00	9	0.111
767	A	1	1	1.00	17	0.059
768	A	1	1	1.00	17	0.059
769	A	4	3	1.00	11	0.273
770	A	8	4	1.00	43	0.093

Chapter 3

Listing of integrals

Local contents

3.1 $\int \frac{e^x}{4+6e^x} \, dx$

Optimal. Leaf size=12

$$\frac{1}{6}\log\left(2+3e^x\right)$$

```
[Out] 1/6*ln(2+3*exp(x))
```

Rubi [A]
time = 0.01, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2278, 31}

$$\frac{1}{6}\log\left(3e^x+2\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^x/(4 + 6*E^x),x]
```

```
[Out] Log[2 + 3*E^x]/6
```

Rule 31

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

Rule 2278

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rubi steps

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

Mathematica [A]
time = 0.01, size = 12, normalized size = 1.00

$$\frac{1}{6}\log\left(2+3e^x\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(4 + 6*E^x),x]
```

```
[Out] Log[2 + 3*E^x]/6
```

Maple [A]
time = 0.01, size = 10, normalized size = 0.83

method	result	size
risch	$\frac{\ln\left(\frac{2}{3}+e^{x}\right)}{6}$	8
derivativedivides	$\frac{\ln\left(4+6\,e^{x}\right)}{6}$	10
default	$\frac{\ln\left(2+3\,e^{x}\right)}{6}$	10
norman	$\frac{\ln\left(4+6\,e^{x}\right)}{6}$	10

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(4+6*exp(x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/6*ln(2+3*exp(x))
```

Maxima [A]
time = 0.33, size = 9, normalized size = 0.75

$$\frac{1}{6}\,\log\left(3\,e^{x}+2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(4+6*exp(x)),x, algorithm="maxima")
```

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

Fricas [A]
time = 0.42, size = 9, normalized size = 0.75

$$\frac{1}{6}\,\log\left(3\,e^{x}+2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(4+6*exp(x)),x, algorithm="fricas")
```

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

Sympy [A]
time = 0.03, size = 8, normalized size = 0.67

$$\frac{\log\left(e^{x}+\frac{2}{3}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(4+6*exp(x)),x)
```

```
[Out] log(exp(x) + 2/3)/6
```

Giac [A]
time = 2.48, size = 9, normalized size = 0.75

$$\frac{1}{6} \log\left(3 e^{x} + 2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(4+6*exp(x)),x, algorithm="giac")
```

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

Mupad [B]
time = 0.05, size = 9, normalized size = 0.75

$$\frac{\ln\left(3 \mathrm{e}^{x} + 2\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(6*exp(x) + 4),x)
```

```
[Out] log(3*exp(x) + 2)/6
```

3.2 $\int \frac{e^x}{a+be^x} \, dx$

Optimal. Leaf size=12

$$\frac{\log(a+be^x)}{b}$$

[Out] ln(a+b*exp(x))/b

Rubi [A]
time = 0.01, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2278, 31}

$$\frac{\log(a+be^x)}{b}$$

Antiderivative was successfully verified.

[In] Int[E^x/(a + b*E^x),x]

[Out] Log[a + b*E^x]/b

Rule 31

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

Rule 2278

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^x}{a+be^x} \, dx &= \text{Subst}\left(\int \frac{1}{a+bx} \, dx, x, e^x\right)\\ &= \frac{\log(a+be^x)}{b}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 12, normalized size = 1.00

$$\frac{\log(a+be^x)}{b}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(a + b*E^x),x]
```

```
[Out] Log[a + b*E^x]/b
```

Maple [A]
time = 0.01, size = 12, normalized size = 1.00

method	result	size
derivativedivides	$\frac{\ln(a+b\,e^{x})}{b}$	12
default	$\frac{\ln(a+b\,e^{x})}{b}$	12
norman	$\frac{\ln(a+b\,e^{x})}{b}$	12
risch	$\frac{\ln\left(e^{x}+\frac{a}{b}\right)}{b}$	14

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(a+b*exp(x)),x,method=_RETURNVERBOSE)
```

```
[Out] ln(a+b*exp(x))/b
```

Maxima [A]
time = 0.33, size = 11, normalized size = 0.92

$$\frac{\log\left(be^{x}+a\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] log(b*e^x + a)/b
```

Fricas [A]
time = 0.38, size = 11, normalized size = 0.92

$$\frac{\log\left(be^{x}+a\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] log(b*e^x + a)/b
```

Sympy [A]
time = 0.04, size = 8, normalized size = 0.67

$$\frac{\log\left(\frac{a}{b}+e^{x}\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(a+b*exp(x)),x)
```

```
[Out] log(a/b + exp(x))/b
```

Giac [A]
time = 3.07, size = 12, normalized size = 1.00

$$\frac{\log\left(|be^x + a|\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] log(abs(b*e^x + a))/b
```

Mupad [B]
time = 0.06, size = 11, normalized size = 0.92

$$\frac{\ln\left(a + b\,\mathrm{e}^x\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(a + b*exp(x)),x)
```

```
[Out] log(a + b*exp(x))/b
```

3.3 $\int \frac{e^{dx}}{a+be^{c+dx}} \, dx$

Optimal. Leaf size=24

$$\frac{e^{-c} \log \left(a+b e^{c+d x}\right)}{b d}$$

[Out] ln(a+b*exp(d*x+c))/b/d/exp(c)

Rubi [A]
time = 0.05, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {2279, 2278, 31}

$$\frac{e^{-c} \log \left(a+b e^{c+d x}\right)}{b d}$$

Antiderivative was successfully verified.

[In] Int[E^(d*x)/(a + b*E^(c + d*x)),x]

[Out] Log[a + b*E^(c + d*x)]/(b*d*E^c)

Rule 31

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

Rule 2278

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rule 2279

```
Int[((a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.))^(p_.)*((G_)^((
h_.)*((f_.) + (g_.)*(x_))))^(m_.), x_Symbol] :> Dist[(G^(h*(f + g*x)))^m/(F
^(e*(c + d*x)))^n, Int[(F^(e*(c + d*x)))^n*(a + b*(F^(e*(c + d*x)))^n)^p, x
], x] /; FreeQ[{F, G, a, b, c, d, e, f, g, h, m, n, p}, x] && EqQ[d*e*n*Log
[F], g*h*m*Log[G]]
```

Rubi steps

$$\int \frac{e^{dx}}{a+be^{c+dx}}\,dx = e^{-c}\int \frac{e^{c+dx}}{a+be^{c+dx}}\,dx$$
$$= \frac{e^{-c}\text{Subst}\left(\int \frac{1}{a+bx}\,dx, x, e^{c+dx}\right)}{d}$$
$$= \frac{e^{-c}\log\left(a+be^{c+dx}\right)}{bd}$$

Mathematica [A]
time = 0.02, size = 24, normalized size = 1.00

$$\frac{e^{-c}\log\left(a+be^{c+dx}\right)}{bd}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(d*x)/(a + b*E^(c + d*x)),x]
```

```
[Out] Log[a + b*E^(c + d*x)]/(b*d*E^c)
```

Maple [A]
time = 0.02, size = 23, normalized size = 0.96

method	result	size
default	$\frac{\ln\left(a+b\,\mathrm{e}^{dx}\,\mathrm{e}^{c}\right)\mathrm{e}^{-c}}{db}$	23
norman	$\frac{\ln\left(a+b\,\mathrm{e}^{dx}\,\mathrm{e}^{c}\right)\mathrm{e}^{-c}}{db}$	23
risch	$\frac{\mathrm{e}^{-c}\ln\left(\mathrm{e}^{dx}+\frac{\mathrm{e}^{-c}a}{b}\right)}{bd}$	27

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(d*x)/(a+b*exp(d*x+c)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*ln(a+b*exp(d*x)*exp(c))/b/exp(c)
```

Maxima [A]
time = 0.28, size = 22, normalized size = 0.92

$$\frac{e^{(-c)}\log\left(be^{(dx+c)}+a\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x)/(a+b*exp(d*x+c)),x, algorithm="maxima")
```

```
[Out] e^(-c)*log(b*e^(d*x + c) + a)/(b*d)
```

Fricas [A]
time = 0.36, size = 22, normalized size = 0.92

$$\frac{e^{(-c)} \log\left(be^{(dx+c)} + a\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x)/(a+b*exp(d*x+c)),x, algorithm="fricas")
```

```
[Out] e^(-c)*log(b*e^(d*x + c) + a)/(b*d)
```

Sympy [A]
time = 0.06, size = 19, normalized size = 0.79

$$\frac{e^{-c} \log\left(\frac{ae^{-c}}{b} + e^{dx}\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x)/(a+b*exp(d*x+c)),x)
```

```
[Out] exp(-c)*log(a*exp(-c)/b + exp(d*x))/(b*d)
```

Giac [A]
time = 2.55, size = 23, normalized size = 0.96

$$\frac{e^{(-c)} \log\left(\left|be^{(dx+c)} + a\right|\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x)/(a+b*exp(d*x+c)),x, algorithm="giac")
```

```
[Out] e^(-c)*log(abs(b*e^(d*x + c) + a))/(b*d)
```

Mupad [B]
time = 0.12, size = 22, normalized size = 0.92

$$\frac{\ln\left(a + b\,\mathrm{e}^{c+d\,x}\right)\,\mathrm{e}^{-c}}{b\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(d*x)/(a + b*exp(c + d*x)),x)
```

```
[Out] (log(a + b*exp(c + d*x))*exp(-c))/(b*d)
```

3.4 $\int \frac{e^{c+dx}}{a+be^{c+dx}}\,dx$

Optimal. Leaf size=19

$$\frac{\log\left(a+be^{c+dx}\right)}{bd}$$

[Out] ln(a+b*exp(d*x+c))/b/d

Rubi [A]
time = 0.02, antiderivative size = 19, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2278, 31}

$$\frac{\log\left(a+be^{c+dx}\right)}{bd}$$

Antiderivative was successfully verified.

[In] Int[E^(c + d*x)/(a + b*E^(c + d*x)),x]

[Out] Log[a + b*E^(c + d*x)]/(b*d)

Rule 31

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

Rule 2278

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subst[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d, e, n, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{c+dx}}{a+be^{c+dx}}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{a+bx}\,dx,x,e^{c+dx}\right)}{d}\\ &= \frac{\log\left(a+be^{c+dx}\right)}{bd}\end{aligned}$$

Mathematica [A]
time = 0.02, size = 22, normalized size = 1.16

$$\frac{\log\left(ad+bde^{c+dx}\right)}{bd}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(c + d*x)/(a + b*E^(c + d*x)),x]
[Out] Log[a*d + b*d*E^(c + d*x)]/(b*d)
```

Maple [A]
time = 0.02, size = 19, normalized size = 1.00

method	result	size
derivativedivides	$\frac{\ln\left(a+b\,\mathrm{e}^{dx+c}\right)}{bd}$	19
default	$\frac{\ln\left(a+b\,\mathrm{e}^{dx+c}\right)}{bd}$	19
norman	$\frac{\ln\left(a+b\,\mathrm{e}^{dx+c}\right)}{bd}$	19
risch	$-\frac{c}{bd}+\frac{\ln\left(\mathrm{e}^{dx+c}+\frac{a}{b}\right)}{bd}$	31

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(d*x+c)/(a+b*exp(d*x+c)),x,method=_RETURNVERBOSE)
[Out] ln(a+b*exp(d*x+c))/b/d
```

Maxima [A]
time = 0.33, size = 18, normalized size = 0.95

$$\frac{\log\left(be^{(dx+c)}+a\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x+c)/(a+b*exp(d*x+c)),x, algorithm="maxima")
[Out] log(b*e^(d*x + c) + a)/(b*d)
```

Fricas [A]
time = 0.38, size = 18, normalized size = 0.95

$$\frac{\log\left(be^{(dx+c)}+a\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x+c)/(a+b*exp(d*x+c)),x, algorithm="fricas")
[Out] log(b*e^(d*x + c) + a)/(b*d)
```

Sympy [A]
time = 0.06, size = 14, normalized size = 0.74

$$\frac{\log\left(\frac{a}{b}+e^{c+dx}\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x+c)/(a+b*exp(d*x+c)),x)
```

```
[Out] log(a/b + exp(c + d*x))/(b*d)
```

Giac [A]
time = 2.45, size = 19, normalized size = 1.00

$$\frac{\log\left(\left|be^{(dx+c)}+a\right|\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x+c)/(a+b*exp(d*x+c)),x, algorithm="giac")
```

```
[Out] log(abs(b*e^(d*x + c) + a))/(b*d)
```

Mupad [B]
time = 0.05, size = 18, normalized size = 0.95

$$\frac{\ln\left(a+b\,{\mathrm{e}}^{c+d\,x}\right)}{b\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c + d*x)/(a + b*exp(c + d*x)),x)
```

```
[Out] log(a + b*exp(c + d*x))/(b*d)
```

3.5 $\int e^x (a + b e^x)^n \, dx$

Optimal. Leaf size=20

$$\frac{(a+be^x)^{1+n}}{b(1+n)}$$

```
[Out] (a+b*exp(x))^(1+n)/b/(1+n)
```

Rubi [A]
time = 0.01, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2278, 32}

$$\frac{(a+be^x)^{n+1}}{b(n+1)}$$

Antiderivative was successfully verified.

```
[In] Int[E^x*(a + b*E^x)^n,x]
[Out] (a + b*E^x)^(1 + n)/(b*(1 + n))
```

Rule 32

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

Rule 2278

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rubi steps

$$\begin{aligned}\int e^x (a+be^x)^n \, dx &= \text{Subst}\left(\int (a+bx)^n \, dx, x, e^x\right)\\ &= \frac{(a+be^x)^{1+n}}{b(1+n)}\end{aligned}$$

Mathematica [A]
time = 0.03, size = 19, normalized size = 0.95

$$\frac{(a+be^x)^{1+n}}{b+bn}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*(a + b*E^x)^n,x]
```

```
[Out] (a + b*E^x)^(1 + n)/(b + b*n)
```

Maple [A]
time = 0.02, size = 20, normalized size = 1.00

method	result	size
derivativedivides	$\frac{(a+b\,\mathrm{e}^{x})^{1+n}}{b(1+n)}$	20
default	$\frac{(a+b\,\mathrm{e}^{x})^{1+n}}{b(1+n)}$	20
risch	$\frac{(a+b\,\mathrm{e}^{x})(a+b\,\mathrm{e}^{x})^{n}}{b(1+n)}$	24
norman	$\frac{\mathrm{e}^{x}\,\mathrm{e}^{n\ln(a+b\,\mathrm{e}^{x})}}{1+n}+\frac{a\,\mathrm{e}^{n\ln(a+b\,\mathrm{e}^{x})}}{b(1+n)}$	40

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(a+b*exp(x))^n,x,method=_RETURNVERBOSE)
```

```
[Out] (a+b*exp(x))^(1+n)/b/(1+n)
```

Maxima [A]
time = 0.28, size = 19, normalized size = 0.95

$$\frac{(be^x+a)^{n+1}}{b(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(a+b*exp(x))^n,x, algorithm="maxima")
```

```
[Out] (b*e^x + a)^(n + 1)/(b*(n + 1))
```

Fricas [A]
time = 0.47, size = 22, normalized size = 1.10

$$\frac{(be^x+a)(be^x+a)^n}{bn+b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(a+b*exp(x))^n,x, algorithm="fricas")
```

```
[Out] (b*e^x + a)*(b*e^x + a)^n/(b*n + b)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 56 vs. $2(14) = 28$.

time = 0.31, size = 56, normalized size = 2.80

$$\begin{cases} \frac{e^x}{a} & \text{for } b = 0 \wedge n = -1 \\ a^n e^x & \text{for } b = 0 \\ \frac{\log\left(\frac{a}{b} + e^x\right)}{b} & \text{for } n = -1 \\ \frac{a(a+be^x)^n}{bn+b} + \frac{b(a+be^x)^n e^x}{bn+b} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(a+b*exp(x))**n,x)
```

```
[Out] Piecewise((exp(x)/a, Eq(b, 0) & Eq(n, -1)), (a**n*exp(x), Eq(b, 0)), (log(a
/b + exp(x))/b, Eq(n, -1)), (a*(a + b*exp(x))**n/(b*n + b) + b*(a + b*exp(x
))**n*exp(x)/(b*n + b), True))
```

Giac [A]
time = 1.53, size = 19, normalized size = 0.95

$$\frac{(be^x + a)^{n+1}}{b(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(a+b*exp(x))^n,x, algorithm="giac")
```

```
[Out] (b*e^x + a)^(n + 1)/(b*(n + 1))
```

Mupad [B]
time = 3.50, size = 19, normalized size = 0.95

$$\frac{(a + b\,e^x)^{n+1}}{b\,(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(a + b*exp(x))^n,x)
```

```
[Out] (a + b*exp(x))^(n + 1)/(b*(n + 1))
```

3.6 $\int e^{dx}\left(a+be^{c+dx}\right)^n\,dx$

Optimal. Leaf size=32

$$\frac{e^{-c}\left(a+be^{c+dx}\right)^{1+n}}{bd(1+n)}$$

```
[Out] (a+b*exp(d*x+c))^(1+n)/b/d/exp(c)/(1+n)
```

Rubi [A]
time = 0.05, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.158$, Rules used = {2279, 2278, 32}

$$\frac{e^{-c}\left(a+be^{c+dx}\right)^{n+1}}{bd(n+1)}$$

Antiderivative was successfully verified.

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

```
[Out] (a + b*E^(c + d*x))^(1 + n)/(b*d*E^c*(1 + n))
```

Rule 32

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

Rule 2278

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rule 2279

```
Int[((a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.))^(p_.)*((G_)^((
h_.)*((f_.) + (g_.)*(x_))))^(m_.), x_Symbol] :> Dist[(G^(h*(f + g*x)))^m/(F
^(e*(c + d*x)))^n, Int[(F^(e*(c + d*x)))^n*(a + b*(F^(e*(c + d*x)))^n)^p, x
], x] /; FreeQ[{F, G, a, b, c, d, e, f, g, h, m, n, p}, x] && EqQ[d*e*n*Log
[F], g*h*m*Log[G]]
```

Rubi steps

$$\int e^{dx}\left(a+be^{c+dx}\right)^n\,dx = e^{-c}\int e^{c+dx}\left(a+be^{c+dx}\right)^n\,dx$$
$$= \frac{e^{-c}\text{Subst}\left(\int (a+bx)^n\,dx, x, e^{c+dx}\right)}{d}$$
$$= \frac{e^{-c}\left(a+be^{c+dx}\right)^{1+n}}{bd(1+n)}$$

Mathematica [A]
time = 0.05, size = 31, normalized size = 0.97

$$\frac{e^{-c}\left(a+be^{c+dx}\right)^{1+n}}{bd+bdn}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(d*x)*(a + b*E^(c + d*x))^n,x]
[Out] (a + b*E^(c + d*x))^(1 + n)/(E^c*(b*d + b*d*n))
```

Maple [A]
time = 0.03, size = 31, normalized size = 0.97

method	result	size
default	$\frac{\left(a+b\,\mathrm{e}^{dx}\mathrm{e}^{c}\right)^{1+n}\mathrm{e}^{-c}}{db(1+n)}$	31
risch	$\frac{\left(a+b\,\mathrm{e}^{dx+c}\right)\mathrm{e}^{-c}\left(a+b\,\mathrm{e}^{dx+c}\right)^{n}}{bd(1+n)}$	39
norman	$\frac{\mathrm{e}^{dx}\mathrm{e}^{n\ln\left(a+b\,\mathrm{e}^{dx}\mathrm{e}^{c}\right)}}{d(1+n)}+\frac{\mathrm{e}^{-c}a\,\mathrm{e}^{n\ln\left(a+b\,\mathrm{e}^{dx}\mathrm{e}^{c}\right)}}{bd(1+n)}$	60

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(d*x)*(a+b*exp(d*x+c))^n,x,method=_RETURNVERBOSE)
[Out] 1/d*(a+b*exp(d*x)*exp(c))^(1+n)/b/exp(c)/(1+n)
```

Maxima [A]
time = 0.27, size = 30, normalized size = 0.94

$$\frac{\left(be^{(dx+c)}+a\right)^{n+1}e^{(-c)}}{bd(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (b*e^(d*x + c) + a)^(n + 1)*e^(-c)/(b*d*(n + 1))
```

Fricas [A]
time = 0.45, size = 36, normalized size = 1.12

$$\frac{\left(be^{(dx)} + ae^{(-c)}\right)\left(be^{(dx+c)} + a\right)^{n}}{bdn + bd}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (b*e^(d*x) + a*e^(-c))*(b*e^(d*x + c) + a)^n/(b*d*n + b*d)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 114 vs. $2(22) = 44$.
time = 2.91, size = 114, normalized size = 3.56

$$\begin{cases} \frac{x}{a} & \text{for } b = 0 \wedge d = 0 \wedge n = -1 \\ \frac{a^{n}e^{dx}}{d} & \text{for } b = 0 \\ x(a + be^{c})^{n} & \text{for } d = 0 \\ \frac{e^{-c}\log\left(\frac{a}{b} + e^{c}e^{dx}\right)}{bd} & \text{for } n = -1 \\ \frac{a\left(a+be^{c}e^{dx}\right)^{n}}{bdne^{c}+bde^{c}} + \frac{b\left(a+be^{c}e^{dx}\right)^{n}e^{c}e^{dx}}{bdne^{c}+bde^{c}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x)*(a+b*exp(d*x+c))**n,x)
```

```
[Out] Piecewise((x/a, Eq(b, 0) & Eq(d, 0) & Eq(n, -1)), (a**n*exp(d*x)/d, Eq(b, 0
)), (x*(a + b*exp(c))**n, Eq(d, 0)), (exp(-c)*log(a/b + exp(c)*exp(d*x))/(b
*d), Eq(n, -1)), (a*(a + b*exp(c)*exp(d*x))**n/(b*d*n*exp(c) + b*d*exp(c))
+ b*(a + b*exp(c)*exp(d*x))**n*exp(c)*exp(d*x)/(b*d*n*exp(c) + b*d*exp(c)),
 True))
```

Giac [A]
time = 2.25, size = 30, normalized size = 0.94

$$\frac{\left(be^{(dx+c)} + a\right)^{n+1}e^{(-c)}}{bd(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (b*e^(d*x + c) + a)^(n + 1)*e^(-c)/(b*d*(n + 1))
```

Mupad [B]
time = 3.55, size = 44, normalized size = 1.38

$$\left(a+b\,\mathrm{e}^{c+d\,x}\right)^n\,\left(\frac{\mathrm{e}^{d\,x}}{d\,\left(n+1\right)}+\frac{a\,\mathrm{e}^{-c}}{b\,d\,\left(n+1\right)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (a + b*exp(c + d*x))^n*(exp(d*x)/(d*(n + 1)) + (a*exp(-c))/(b*d*(n + 1)))
```

3.7 $\int e^{c+dx}\left(a+be^{c+dx}\right)^n\,dx$

Optimal. Leaf size=27

$$\frac{\left(a+be^{c+dx}\right)^{1+n}}{bd(1+n)}$$

```
[Out] (a+b*exp(d*x+c))^(1+n)/b/d/(1+n)
```

Rubi [A]
time = 0.03, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2278, 32}

$$\frac{\left(a+be^{c+dx}\right)^{n+1}}{bd(n+1)}$$

Antiderivative was successfully verified.

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

```
[Out] (a + b*E^(c + d*x))^(1 + n)/(b*d*(1 + n))
```

Rule 32

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

Rule 2278

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rubi steps

$$\begin{aligned}\int e^{c+dx}\left(a+be^{c+dx}\right)^n\,dx &= \frac{\text{Subst}\left(\int (a+bx)^n\,dx, x, e^{c+dx}\right)}{d}\\ &= \frac{\left(a+be^{c+dx}\right)^{1+n}}{bd(1+n)}\end{aligned}$$

Mathematica [A]
time = 0.05, size = 26, normalized size = 0.96

$$\frac{\left(a+be^{c+dx}\right)^{1+n}}{bd+bdn}$$

Antiderivative was successfully verified.

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

```
[Out] (a + b*E^(c + d*x))^(1 + n)/(b*d + b*d*n)
```

Maple [A]
time = 0.02, size = 27, normalized size = 1.00

method	result	size
derivativedivides	$\frac{\left(a+b\,{\mathrm e}^{d x+c}\right)^{1+n}}{b d \left(1+n\right)}$	27
default	$\frac{\left(a+b\,{\mathrm e}^{d x+c}\right)^{1+n}}{b d \left(1+n\right)}$	27
risch	$\frac{\left(a+b\,{\mathrm e}^{d x+c}\right) \left(a+b\,{\mathrm e}^{d x+c}\right)^{n}}{b d \left(1+n\right)}$	35
norman	$\frac{{\mathrm e}^{d x+c} {\mathrm e}^{n \ln \left(a+b\,{\mathrm e}^{d x+c}\right)}}{d \left(1+n\right)}+\frac{a\,{\mathrm e}^{n \ln \left(a+b\,{\mathrm e}^{d x+c}\right)}}{b d \left(1+n\right)}$	58

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(d*x+c)*(a+b*exp(d*x+c))^n,x,method=_RETURNVERBOSE)
```

```
[Out] (a+b*exp(d*x+c))^(1+n)/b/d/(1+n)
```

Maxima [A]
time = 0.28, size = 26, normalized size = 0.96

$$\frac{\left(be^{(dx+c)}+a\right)^{n+1}}{bd(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (b*e^(d*x + c) + a)^(n + 1)/(b*d*(n + 1))
```

Fricas [A]
time = 0.44, size = 33, normalized size = 1.22

$$\frac{\left(be^{(dx+c)}+a\right)\left(be^{(dx+c)}+a\right)^{n}}{bdn+bd}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (b*e^(d*x + c) + a)*(b*e^(d*x + c) + a)^n/(b*d*n + b*d)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 107 vs. $2(19) = 38$.
time = 5.52, size = 107, normalized size = 3.96

$$\begin{cases} \frac{xe^c}{a} & \text{for } b = 0 \wedge d = 0 \wedge n = -1 \\ \frac{a^n e^c e^{dx}}{d} & \text{for } b = 0 \\ x(a + be^c)^n e^c & \text{for } d = 0 \\ \frac{\log\left(\frac{ae^{-c}}{b} + e^{dx}\right)}{bd} & \text{for } n = -1 \\ \frac{a(a+be^c e^{dx})^n}{bdn+bd} + \frac{b(a+be^c e^{dx})^n e^c e^{dx}}{bdn+bd} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x+c)*(a+b*exp(d*x+c))**n,x)
```

```
[Out] Piecewise((x*exp(c)/a, Eq(b, 0) & Eq(d, 0) & Eq(n, -1)), (a**n*exp(c)*exp(d
*x)/d, Eq(b, 0)), (x*(a + b*exp(c))**n*exp(c), Eq(d, 0)), (log(a*exp(-c)/b
+ exp(d*x))/(b*d), Eq(n, -1)), (a*(a + b*exp(c)*exp(d*x))**n/(b*d*n + b*d)
+ b*(a + b*exp(c)*exp(d*x))**n*exp(c)*exp(d*x)/(b*d*n + b*d), True))
```

Giac [A]
time = 2.91, size = 26, normalized size = 0.96

$$\frac{\left(be^{(dx+c)} + a\right)^{n+1}}{bd(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (b*e^(d*x + c) + a)^(n + 1)/(b*d*(n + 1))
```

Mupad [B]
time = 3.48, size = 26, normalized size = 0.96

$$\frac{\left(a + b\,e^{c+d\,x}\right)^{n+1}}{b\,d\,(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (a + b*exp(c + d*x))^(n + 1)/(b*d*(n + 1))
```

3.8 $\int \frac{F^x}{a+bF^x} dx$

Optimal. Leaf size=16

$$\frac{\log(a+bF^x)}{b\log(F)}$$

[Out] ln(a+b*F^x)/b/ln(F)

Rubi [A]
time = 0.02, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2278, 31}

$$\frac{\log(a+bF^x)}{b\log(F)}$$

Antiderivative was successfully verified.

[In] Int[F^x/(a + b*F^x),x]

[Out] Log[a + b*F^x]/(b*Log[F])

Rule 31

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

Rule 2278

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{F^x}{a+bF^x}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{a+bx}\,dx, x, F^x\right)}{\log(F)}\\ &= \frac{\log(a+bF^x)}{b\log(F)}\end{aligned}$$

Mathematica [A]
time = 0.02, size = 21, normalized size = 1.31

$$\frac{\log(a\log(F)+bF^x\log(F))}{b\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^x/(a + b*F^x),x]
[Out] Log[a*Log[F] + b*F^x*Log[F]]/(b*Log[F])
```

Maple [A]
time = 0.01, size = 17, normalized size = 1.06

method	result	size
derivativedivides	$\frac{\ln(a+b F^{x})}{b \ln(F)}$	17
default	$\frac{\ln(a+b F^{x})}{b \ln(F)}$	17
norman	$\frac{\ln\left(a+b\, \mathrm{e}^{x \ln(F)}\right)}{b \ln(F)}$	19
risch	$\frac{\ln\left(F^{x}+\frac{a}{b}\right)}{b \ln(F)}$	19

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^x/(a+b*F^x),x,method=_RETURNVERBOSE)
[Out] ln(a+b*F^x)/b/ln(F)
```

Maxima [A]
time = 0.28, size = 16, normalized size = 1.00

$$\frac{\log\left(F^{x} b + a\right)}{b \log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^x/(a+b*F^x),x, algorithm="maxima")
[Out] log(F^x*b + a)/(b*log(F))
```

Fricas [A]
time = 0.36, size = 16, normalized size = 1.00

$$\frac{\log\left(F^{x} b + a\right)}{b \log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^x/(a+b*F^x),x, algorithm="fricas")
[Out] log(F^x*b + a)/(b*log(F))
```

Sympy [A]
time = 0.04, size = 12, normalized size = 0.75

$$\frac{\log\left(F^{x} + \frac{a}{b}\right)}{b \log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**x/(a+b*F**x),x)
```

```
[Out] log(F**x + a/b)/(b*log(F))
```

Giac [A]
time = 3.04, size = 17, normalized size = 1.06

$$\frac{\log\left(\left|F^{x}b + a\right|\right)}{b\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^x/(a+b*F^x),x, algorithm="giac")
```

```
[Out] log(abs(F^x*b + a))/(b*log(F))
```

Mupad [B]
time = 3.44, size = 16, normalized size = 1.00

$$\frac{\ln\left(a + F^{x}\,b\right)}{b\,\ln\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^x/(a + F^x*b),x)
```

```
[Out] log(a + F^x*b)/(b*log(F))
```

3.9 $\int \frac{F^{dx}}{a+bF^{c+dx}} \, dx$

Optimal. Leaf size=28

$$\frac{F^{-c} \log \left(a + bF^{c+dx}\right)}{bd \log(F)}$$

```
[Out] ln(a+b*F^(d*x+c))/b/d/(F^c)/ln(F)
```

Rubi [A]
time = 0.05, antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.158$, Rules used = {2279, 2278, 31}

$$\frac{F^{-c} \log \left(a + bF^{c+dx}\right)}{bd \log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(d*x)/(a + b*F^(c + d*x)),x]
```

```
[Out] Log[a + b*F^(c + d*x)]/(b*d*F^c*Log[F])
```

Rule 31

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

Rule 2278

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rule 2279

```
Int[((a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.))^(p_.)*((G_)^((
h_.)*((f_.) + (g_.)*(x_))))^(m_.), x_Symbol] :> Dist[(G^(h*(f + g*x)))^m/(F
^(e*(c + d*x)))^n, Int[(F^(e*(c + d*x)))^n*(a + b*(F^(e*(c + d*x)))^n)^p, x
], x] /; FreeQ[{F, G, a, b, c, d, e, f, g, h, m, n, p}, x] && EqQ[d*e*n*Log
[F], g*h*m*Log[G]]
```

Rubi steps

$$\int \frac{F^{dx}}{a+bF^{c+dx}}\,dx = F^{-c}\int \frac{F^{c+dx}}{a+bF^{c+dx}}\,dx$$
$$= \frac{F^{-c}\text{Subst}\left(\int \frac{1}{a+bx}\,dx, x, F^{c+dx}\right)}{d\log(F)}$$
$$= \frac{F^{-c}\log\left(a+bF^{c+dx}\right)}{bd\log(F)}$$

Mathematica [A]
time = 0.02, size = 28, normalized size = 1.00

$$\frac{F^{-c}\log\left(a+bF^{c+dx}\right)}{bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(d*x)/(a + b*F^(c + d*x)),x]
```

```
[Out] Log[a + b*F^(c + d*x)]/(b*d*F^c*Log[F])
```

Maple [A]
time = 0.02, size = 33, normalized size = 1.18

method	result	size
norman	$\frac{F^{-c}\ln\left(a+b\,e^{c\ln(F)}e^{d\ln(F)x}\right)}{b\ln(F)d}$	33
risch	$\frac{F^{-c}\ln\left(F^{dx}+\frac{F^{-c}a}{b}\right)}{\ln(F)db}$	34

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(d*x)/(a+b*F^(d*x+c)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/(F^c)/b/ln(F)/d*ln(a+b*exp(c*ln(F))*exp(d*ln(F)*x))
```

Maxima [A]
time = 0.28, size = 28, normalized size = 1.00

$$\frac{\log\left(F^{dx+c}b+a\right)}{F^{c}bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(d*x)/(a+b*F^(d*x+c)),x, algorithm="maxima")
```

```
[Out] log(F^(d*x + c)*b + a)/(F^c*b*d*log(F))
```

Fricas [A]
time = 0.41, size = 28, normalized size = 1.00

$$\frac{\log \left(F^{dx+c}b+a\right)}{F^{c}bd\log \left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(d*x)/(a+b*F^(d*x+c)),x, algorithm="fricas")
[Out] log(F^(d*x + c)*b + a)/(F^c*b*d*log(F))
```

Sympy [A]
time = 0.19, size = 24, normalized size = 0.86

$$\frac{e^{-c\log \left(F\right)}\log \left(F^{c+dx}+\frac{a}{b}\right)}{bd\log \left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(d*x)/(a+b*F**(d*x+c)),x)
[Out] exp(-c*log(F))*log(F**(c + d*x) + a/b)/(b*d*log(F))
```

Giac [A]
time = 2.94, size = 30, normalized size = 1.07

$$\frac{\log \left(\left|F^{dx}F^{c}b+a\right|\right)}{F^{c}bd\log \left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(d*x)/(a+b*F^(d*x+c)),x, algorithm="giac")
[Out] log(abs(F^(d*x)*F^c*b + a))/(F^c*b*d*log(F))
```

Mupad [B]
time = 3.58, size = 28, normalized size = 1.00

$$\frac{\ln \left(a+F^{c+d\,x}\,b\right)}{F^{c}\,b\,d\,\ln \left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(d*x)/(a + F^(c + d*x)*b),x)
[Out] log(a + F^(c + d*x)*b)/(F^c*b*d*log(F))
```

3.10 $\int \frac{F^{c+dx}}{a+bF^{c+dx}}\,dx$

Optimal. Leaf size=23

$$\frac{\log\left(a+bF^{c+dx}\right)}{bd\log(F)}$$

```
[Out] ln(a+b*F^(d*x+c))/b/d/ln(F)
```

Rubi [A]
time = 0.03, antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2278, 31}

$$\frac{\log\left(a+bF^{c+dx}\right)}{bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(c + d*x)/(a + b*F^(c + d*x)),x]
```

```
[Out] Log[a + b*F^(c + d*x)]/(b*d*Log[F])
```

Rule 31

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

Rule 2278

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{F^{c+dx}}{a+bF^{c+dx}}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{a+bx}\,dx, x, F^{c+dx}\right)}{d\log(F)}\\ &= \frac{\log\left(a+bF^{c+dx}\right)}{bd\log(F)}\end{aligned}$$

Mathematica [A]
time = 0.00, size = 30, normalized size = 1.30

$$\frac{\log\left(ad\log(F)+bdF^{c+dx}\log(F)\right)}{bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(c + d*x)/(a + b*F^(c + d*x)),x]
```

```
[Out] Log[a*d*Log[F] + b*d*F^(c + d*x)*Log[F]]/(b*d*Log[F])
```

Maple [A]
time = 0.00, size = 24, normalized size = 1.04

method	result	size
derivativedivides	$\frac{\ln\left(a+b\,F^{d x+c}\right)}{b d \ln\left(F\right)}$	24
default	$\frac{\ln\left(a+b\,F^{d x+c}\right)}{b d \ln\left(F\right)}$	24
norman	$\frac{\ln\left(a+b\,{\mathrm e}^{\left(d x+c\right) \ln\left(F\right)}\right)}{b \ln\left(F\right) d}$	26
risch	$-\frac{c}{b d}+\frac{\ln\left(F^{d x+c}+\frac{a}{b}\right)}{b \ln\left(F\right) d}$	36

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(d*x+c)/(a+b*F^(d*x+c)),x,method=_RETURNVERBOSE)
```

```
[Out] ln(a+b*F^(d*x+c))/b/d/ln(F)
```

Maxima [A]
time = 0.30, size = 23, normalized size = 1.00

$$\frac{\log\left(F^{dx+c}b+a\right)}{bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(d*x+c)/(a+b*F^(d*x+c)),x, algorithm="maxima")
```

```
[Out] log(F^(d*x + c)*b + a)/(b*d*log(F))
```

Fricas [A]
time = 0.37, size = 23, normalized size = 1.00

$$\frac{\log\left(F^{dx+c}b+a\right)}{bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(d*x+c)/(a+b*F^(d*x+c)),x, algorithm="fricas")
```

```
[Out] log(F^(d*x + c)*b + a)/(b*d*log(F))
```

Sympy [A]
time = 0.05, size = 17, normalized size = 0.74

$$\frac{\log\left(F^{c+dx}+\frac{a}{b}\right)}{bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(d*x+c)/(a+b*F**(d*x+c)),x)
```

```
[Out] log(F**(c + d*x) + a/b)/(b*d*log(F))
```

Giac [A]
time = 2.57, size = 24, normalized size = 1.04

$$\frac{\log\left(\left|F^{dx+c}b+a\right|\right)}{bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(d*x+c)/(a+b*F^(d*x+c)),x, algorithm="giac")
```

```
[Out] log(abs(F^(d*x + c)*b + a))/(b*d*log(F))
```

Mupad [B]
time = 0.00, size = 23, normalized size = 1.00

$$\frac{\ln\left(a+F^{c+d\,x}\,b\right)}{b\,d\,\ln\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(c + d*x)/(a + F^(c + d*x)*b),x)
```

```
[Out] log(a + F^(c + d*x)*b)/(b*d*log(F))
```

3.11 $\int F^x(a+bF^x)^n\,dx$

Optimal. Leaf size=24

$$\frac{(a+bF^x)^{1+n}}{b(1+n)\log(F)}$$

```
[Out] (a+b*F^x)^(1+n)/b/(1+n)/ln(F)
```

Rubi [A]
time = 0.02, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2278, 32}

$$\frac{(a+bF^x)^{n+1}}{b(n+1)\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^x*(a + b*F^x)^n,x]
```

```
[Out] (a + b*F^x)^(1 + n)/(b*(1 + n)*Log[F])
```

Rule 32

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

Rule 2278

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subst[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d, e, n, p}, x]
```

Rubi steps

$$\begin{aligned}\int F^x(a+bF^x)^n\,dx &= \frac{\text{Subst}\left(\int (a+bx)^n\,dx, x, F^x\right)}{\log(F)}\\ &= \frac{(a+bF^x)^{1+n}}{b(1+n)\log(F)}\end{aligned}$$

Mathematica [A]
time = 0.05, size = 24, normalized size = 1.00

$$\frac{(a+bF^x)^{1+n}}{b\log(F)+bn\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^x*(a + b*F^x)^n,x]
```

```
[Out] (a + b*F^x)^(1 + n)/(b*Log[F] + b*n*Log[F])
```

Maple [A]
time = 0.03, size = 25, normalized size = 1.04

method	result	size
derivativedivides	$\frac{(a+b F^{x})^{1+n}}{b(1+n)\ln(F)}$	25
default	$\frac{(a+b F^{x})^{1+n}}{b(1+n)\ln(F)}$	25
risch	$\frac{(a+b F^{x})(a+b F^{x})^{n}}{\ln(F)b(1+n)}$	30
norman	$\frac{e^{x\ln(F)}e^{n\ln\left(a+b\,e^{x\ln(F)}\right)}}{\ln(F)(1+n)}+\frac{a\,e^{n\ln\left(a+b\,e^{x\ln(F)}\right)}}{\ln(F)b(1+n)}$	57

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^x*(a+b*F^x)^n,x,method=_RETURNVERBOSE)
```

```
[Out] (a+b*F^x)^(1+n)/b/(1+n)/ln(F)
```

Maxima [A]
time = 0.28, size = 24, normalized size = 1.00

$$\frac{(F^{x}b+a)^{n+1}}{b(n+1)\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^x*(a+b*F^x)^n,x, algorithm="maxima")
```

```
[Out] (F^x*b + a)^(n + 1)/(b*(n + 1)*log(F))
```

Fricas [A]
time = 0.41, size = 28, normalized size = 1.17

$$\frac{(F^{x}b+a)(F^{x}b+a)^{n}}{(bn+b)\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^x*(a+b*F^x)^n,x, algorithm="fricas")
```

```
[Out] (F^x*b + a)*(F^x*b + a)^n/((b*n + b)*log(F))
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 82 vs. $2(17) = 34$.
time = 0.45, size = 82, normalized size = 3.42

$$\begin{cases} \frac{x}{a} & \text{for } F = 1 \wedge b = 0 \wedge n = -1 \\ x(a+b)^n & \text{for } F = 1 \\ \frac{F^x a^n}{\log(F)} & \text{for } b = 0 \\ \frac{\log\left(F^x + \frac{a}{b}\right)}{b\log(F)} & \text{for } n = -1 \\ \frac{F^x b(F^x b+a)^n}{bn\log(F)+b\log(F)} + \frac{a(F^x b+a)^n}{bn\log(F)+b\log(F)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**x*(a+b*F**x)**n,x)
```

```
[Out] Piecewise((x/a, Eq(F, 1) & Eq(b, 0) & Eq(n, -1)), (x*(a + b)**n, Eq(F, 1)),
 (F**x*a**n/log(F), Eq(b, 0)), (log(F**x + a/b)/(b*log(F)), Eq(n, -1)), (F*
*x*b*(F**x*b + a)**n/(b*n*log(F) + b*log(F)) + a*(F**x*b + a)**n/(b*n*log(F
) + b*log(F)), True))
```

Giac [A]
time = 1.95, size = 24, normalized size = 1.00

$$\frac{(F^x b + a)^{n+1}}{b(n+1)\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^x*(a+b*F^x)^n,x, algorithm="giac")
```

```
[Out] (F^x*b + a)^(n + 1)/(b*(n + 1)*log(F))
```

Mupad [B]
time = 3.48, size = 24, normalized size = 1.00

$$\frac{(a + F^x\, b)^{n+1}}{b\,\ln(F)\,(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^x*(a + F^x*b)^n,x)
```

```
[Out] (a + F^x*b)^(n + 1)/(b*log(F)*(n + 1))
```

3.12 $\int F^{dx}\left(a+bF^{c+dx}\right)^n\,dx$

Optimal. Leaf size=36

$$\frac{F^{-c}\left(a+bF^{c+dx}\right)^{1+n}}{bd(1+n)\log(F)}$$

```
[Out] (a+b*F^(d*x+c))^(1+n)/b/d/(F^c)/(1+n)/ln(F)
```

Rubi [A]
time = 0.05, antiderivative size = 36, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.158$, Rules used = {2279, 2278, 32}

$$\frac{F^{-c}\left(a+bF^{c+dx}\right)^{n+1}}{bd(n+1)\log(F)}$$

Antiderivative was successfully verified.

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

```
[Out] (a + b*F^(c + d*x))^(1 + n)/(b*d*F^c*(1 + n)*Log[F])
```

Rule 32

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

Rule 2278

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rule 2279

```
Int[((a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.))^(p_.)*((G_)^((
h_.)*((f_.) + (g_.)*(x_))))^(m_.), x_Symbol] :> Dist[(G^(h*(f + g*x)))^m/(F
^(e*(c + d*x)))^n, Int[(F^(e*(c + d*x)))^n*(a + b*(F^(e*(c + d*x)))^n)^p, x
], x] /; FreeQ[{F, G, a, b, c, d, e, f, g, h, m, n, p}, x] && EqQ[d*e*n*Log
[F], g*h*m*Log[G]]
```

Rubi steps

$$\int F^{dx}\left(a+bF^{c+dx}\right)^n\,dx = F^{-c}\int F^{c+dx}\left(a+bF^{c+dx}\right)^n\,dx$$
$$= \frac{F^{-c}\text{Subst}\left(\int (a+bx)^n\,dx, x, F^{c+dx}\right)}{d\log(F)}$$
$$= \frac{F^{-c}\left(a+bF^{c+dx}\right)^{1+n}}{bd(1+n)\log(F)}$$

Mathematica [A]
time = 0.06, size = 35, normalized size = 0.97

$$\frac{F^{-c}\left(a+bF^{c+dx}\right)^{1+n}}{bd\log(F)+bdn\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(d*x)*(a + b*F^(c + d*x))^n,x]
[Out] (a + b*F^(c + d*x))^(1 + n)/(F^c*(b*d*Log[F] + b*d*n*Log[F]))
```

Maple [A]
time = 0.04, size = 48, normalized size = 1.33

method	result	size
risch	$\frac{\left(a+F^{c}F^{dx}b\right)F^{-c}\left(a+F^{c}F^{dx}b\right)^{n}}{b(1+n)\ln(F)d}$	48
norman	$\frac{e^{d\ln(F)x}e^{n\ln\left(a+b\,e^{c\ln(F)}e^{d\ln(F)x}\right)}}{\ln(F)d(1+n)}+\frac{F^{-c}a\,e^{n\ln\left(a+b\,e^{c\ln(F)}e^{d\ln(F)x}\right)}}{\ln(F)bd(1+n)}$	81

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(d*x)*(a+b*F^(d*x+c))^n,x,method=_RETURNVERBOSE)
[Out] (a+F^c*F^(d*x)*b)/(F^c)/b/(1+n)/ln(F)/d*(a+F^c*F^(d*x)*b)^n
```

Maxima [A]
time = 0.28, size = 36, normalized size = 1.00

$$\frac{\left(F^{dx+c}b+a\right)^{n+1}}{F^{c}bd(n+1)\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(d*x)*(a+b*F^(d*x+c))^n,x, algorithm="maxima")
[Out] (F^(d*x + c)*b + a)^(n + 1)/(F^c*b*d*(n + 1)*log(F))
```

Fricas [A]
time = 0.40, size = 50, normalized size = 1.39

$$\frac{\left(F^{dx+c}b+a\right)^{n}\left(\frac{F^{dx+c}b}{F^{c}}+\frac{a}{F^{c}}\right)}{(bdn+bd)\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (F^(d*x + c)*b + a)^n*(F^(d*x + c)*b/F^c + a/F^c)/((b*d*n + b*d)*log(F))
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 71 vs. $2(26) = 52$.
time = 2.89, size = 71, normalized size = 1.97

$$\begin{cases} x(F^{c}b+a)^{n} & \text{for } d=0 \\ x(a+b)^{n} & \text{for } \log\left(F\right)=0 \\ \frac{\begin{cases} F^{dx}a^{n} & \text{for } F^{c}=0 \vee b=0 \\ \frac{F^{-c}\left(\begin{cases} \frac{\left(F^{c}F^{dx}b+a\right)^{n+1}}{n+1} & \text{for } n\neq -1 \\ \log\left(F^{c}F^{dx}b+a\right) & \text{otherwise} \end{cases}\right)}{b} & \text{otherwise} \end{cases}}{d\log\left(F\right)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(d*x)*(a+b*F**(d*x+c))**n,x)
```

```
[Out] Piecewise((x*(F**c*b + a)**n, Eq(d, 0)), (x*(a + b)**n, Eq(log(F), 0)), (Pi
ecewise((F**(d*x)*a**n, Eq(b, 0) | Eq(F**c, 0)), (Piecewise(((F**c*F**(d*x)
*b + a)**(n + 1)/(n + 1), Ne(n, -1)), (log(F**c*F**(d*x)*b + a), True))/(F*
*c*b), True))/(d*log(F)), True))
```

Giac [A]
time = 3.19, size = 36, normalized size = 1.00

$$\frac{\left(F^{dx+c}b+a\right)^{n+1}}{F^{c}bd(n+1)\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (F^(d*x + c)*b + a)^(n + 1)/(F^c*b*d*(n + 1)*log(F))
```

Mupad [B]
time = 3.53, size = 55, normalized size = 1.53

$$(a+F^{c+d\,x}\,b)^n\,\left(\frac{F^{d\,x}}{d\,\ln\left(F\right)\,\left(n+1\right)}+\frac{a}{F^c\,b\,d\,\ln\left(F\right)\,\left(n+1\right)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(d*x)*(a + F^(c + d*x)*b)^n,x)
[Out] (a + F^(c + d*x)*b)^n*(F^(d*x)/(d*log(F)*(n + 1)) + a/(F^c*b*d*log(F)*(n +
1)))
```

3.13 $\int F^{c+dx}\left(a+bF^{c+dx}\right)^n\,dx$

Optimal. Leaf size=31

$$\frac{\left(a+bF^{c+dx}\right)^{1+n}}{bd(1+n)\log(F)}$$

```
[Out] (a+b*F^(d*x+c))^(1+n)/b/d/(1+n)/ln(F)
```

Rubi [A]
time = 0.02, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2278, 32}

$$\frac{\left(a+bF^{c+dx}\right)^{n+1}}{bd(n+1)\log(F)}$$

Antiderivative was successfully verified.

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

```
[Out] (a + b*F^(c + d*x))^(1 + n)/(b*d*(1 + n)*Log[F])
```

Rule 32

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

Rule 2278

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rubi steps

$$\begin{aligned}\int F^{c+dx}\left(a+bF^{c+dx}\right)^n\,dx &= \frac{\operatorname{Subst}\left(\int (a+bx)^n\,dx, x, F^{c+dx}\right)}{d\log(F)}\\ &= \frac{\left(a+bF^{c+dx}\right)^{1+n}}{bd(1+n)\log(F)}\end{aligned}$$

Mathematica [A]
time = 0.06, size = 30, normalized size = 0.97

$$\frac{\left(a+bF^{c+dx}\right)^{1+n}}{bd\log(F)+bdn\log(F)}$$

Antiderivative was successfully verified.

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

```
[Out] (a + b*F^(c + d*x))^(1 + n)/(b*d*Log[F] + b*d*n*Log[F])
```

Maple [A]
time = 0.02, size = 32, normalized size = 1.03

method	result	size
derivativedivides	$\frac{\left(a+b\,F^{dx+c}\right)^{1+n}}{bd(1+n)\ln(F)}$	32
default	$\frac{\left(a+b\,F^{dx+c}\right)^{1+n}}{bd(1+n)\ln(F)}$	32
risch	$\frac{\left(a+b\,F^{dx+c}\right)\left(a+b\,F^{dx+c}\right)^{n}}{\ln(F)bd(1+n)}$	41
norman	$\frac{e^{(dx+c)\ln(F)}e^{n\ln\left(a+b\,e^{(dx+c)\ln(F)}\right)}}{\ln(F)d(1+n)}+\frac{a\,e^{n\ln\left(a+b\,e^{(dx+c)\ln(F)}\right)}}{\ln(F)bd(1+n)}$	75

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(d*x+c)*(a+b*F^(d*x+c))^n,x,method=_RETURNVERBOSE)
```

```
[Out] (a+b*F^(d*x+c))^(1+n)/b/d/(1+n)/ln(F)
```

Maxima [A]
time = 0.27, size = 31, normalized size = 1.00

$$\frac{\left(F^{dx+c}b+a\right)^{n+1}}{bd(n+1)\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (F^(d*x + c)*b + a)^(n + 1)/(b*d*(n + 1)*log(F))
```

Fricas [A]
time = 0.36, size = 39, normalized size = 1.26

$$\frac{\left(F^{dx+c}b+a\right)\left(F^{dx+c}b+a\right)^{n}}{\left(bdn+bd\right)\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (F^(d*x + c)*b + a)*(F^(d*x + c)*b + a)^n/((b*d*n + b*d)*log(F))
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 71 vs. $2(22) = 44$.
time = 2.74, size = 71, normalized size = 2.29

$$\begin{cases} \frac{\begin{cases} (a+b)^n (c+dx) & \text{for } \log(F) = 0 \\ \frac{\begin{cases} F^{c+dx} a^n & \text{for } b = 0 \\ \frac{\begin{cases} \frac{(F^{c+dx} b + a)^{n+1}}{n+1} & \text{for } n \neq -1 \\ \log(F^{c+dx} b + a) & \text{otherwise} \end{cases}}{b} & \text{otherwise} \end{cases}}{\log(F)} & \text{otherwise} \end{cases}}{d} & \text{for } d \neq 0 \\ F^c x (F^c b + a)^n & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(d*x+c)*(a+b*F**(d*x+c))**n,x)
```

```
[Out] Piecewise((Piecewise(((a + b)**n*(c + d*x), Eq(log(F), 0)), (Piecewise((F**
(c + d*x)*a**n, Eq(b, 0)), (Piecewise(((F**(c + d*x)*b + a)**(n + 1)/(n + 1
), Ne(n, -1)), (log(F**(c + d*x)*b + a), True))/b, True))/log(F), True))/d,
 Ne(d, 0)), (F**c*x*(F**c*b + a)**n, True))
```

Giac [A]
time = 2.79, size = 31, normalized size = 1.00

$$\frac{\left(F^{dx+c} b + a\right)^{n+1}}{bd(n+1)\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (F^(d*x + c)*b + a)^(n + 1)/(b*d*(n + 1)*log(F))
```

Mupad [B]
time = 3.43, size = 52, normalized size = 1.68

$$\left(a + F^{c+d\,x}\,b\right)^n \left(\frac{F^{c+d\,x}}{d\,\ln(F)\,\left(n+1\right)} + \frac{a}{b\,d\,\ln(F)\,\left(n+1\right)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (a + F^(c + d*x)*b)^n*(F^(c + d*x)/(d*log(F)*(n + 1)) + a/(b*d*log(F)*(n +
1)))
```

3.14 $\int (e^x)^n (a+b(e^x)^n)^p \, dx$

Optimal. Leaf size=25

$$\frac{(a+b(e^x)^n)^{1+p}}{bn(1+p)}$$

```
[Out] (a+b*exp(x)^n)^(1+p)/b/n/(1+p)
```

Rubi [A]
time = 0.03, antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$, Rules used = {2278, 32}

$$\frac{(a+b(e^x)^n)^{p+1}}{bn(p+1)}$$

Antiderivative was successfully verified.

```
[In] Int[(E^x)^n*(a + b*(E^x)^n)^p,x]
```

```
[Out] (a + b*(E^x)^n)^(1 + p)/(b*n*(1 + p))
```

Rule 32

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

Rule 2278

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rubi steps

$$\begin{aligned} \int (e^x)^n (a+b(e^x)^n)^p \, dx &= \frac{\text{Subst}\left(\int (a+bx)^p \, dx, x, (e^x)^n\right)}{n} \\ &= \frac{(a+b(e^x)^n)^{1+p}}{bn(1+p)} \end{aligned}$$

Mathematica [A]
time = 0.09, size = 24, normalized size = 0.96

$$\frac{(a+b(e^x)^n)^{1+p}}{bn+bnp}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^x)^n*(a + b*(E^x)^n)^p,x]
[Out] (a + b*(E^x)^n)^(1 + p)/(b*n + b*n*p)
```

Maple [A]
time = 0.02, size = 25, normalized size = 1.00

method	result	size
derivativedivides	$\frac{(a+b(e^x)^n)^{1+p}}{bn(1+p)}$	25
default	$\frac{(a+b(e^x)^n)^{1+p}}{bn(1+p)}$	25
risch	$\frac{(a+b\,e^{nx})(a+b\,e^{nx})^p}{bn(1+p)}$	31
norman	$\frac{e^{nx}e^{p\ln(a+b\,e^{nx})}}{n(1+p)}+\frac{a\,e^{p\ln(a+b\,e^{nx})}}{bn(1+p)}$	52

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)^n*(a+b*exp(x)^n)^p,x,method=_RETURNVERBOSE)
[Out] (a+b*exp(x)^n)^(1+p)/b/n/(1+p)
```

Maxima [A]
time = 0.28, size = 24, normalized size = 0.96

$$\frac{\left(be^{(nx)}+a\right)^{p+1}}{bn(p+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)^n*(a+b*exp(x)^n)^p,x, algorithm="maxima")
[Out] (b*e^(n*x) + a)^(p + 1)/(b*n*(p + 1))
```

Fricas [A]
time = 0.35, size = 29, normalized size = 1.16

$$\frac{\left(be^{(nx)}+a\right)\left(be^{(nx)}+a\right)^{p}}{bnp+bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)^n*(a+b*exp(x)^n)^p,x, algorithm="fricas")
[Out] (b*e^(n*x) + a)*(b*e^(n*x) + a)^p/(b*n*p + b*n)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 80 vs. $2(17) = 34$.
time = 0.76, size = 80, normalized size = 3.20

$$\begin{cases} \frac{x}{a} & \text{for } b = 0 \wedge n = 0 \wedge p = -1 \\ \frac{a^p (e^x)^n}{n} & \text{for } b = 0 \\ x(a+b)^p & \text{for } n = 0 \\ \frac{\log\left(\frac{a}{b} + (e^x)^n\right)}{bn} & \text{for } p = -1 \\ \frac{a(a+b(e^x)^n)^p}{bnp+bn} + \frac{b(a+b(e^x)^n)^p (e^x)^n}{bnp+bn} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)**n*(a+b*exp(x)**n)**p,x)
```

```
[Out] Piecewise((x/a, Eq(b, 0) & Eq(n, 0) & Eq(p, -1)), (a**p*exp(x)**n/n, Eq(b,
0)), (x*(a + b)**p, Eq(n, 0)), (log(a/b + exp(x)**n)/(b*n), Eq(p, -1)), (a*
(a + b*exp(x)**n)**p/(b*n*p + b*n) + b*(a + b*exp(x)**n)**p*exp(x)**n/(b*n*
p + b*n), True))
```

Giac [A]
time = 2.50, size = 24, normalized size = 0.96

$$\frac{\left(be^{(nx)} + a\right)^{p+1}}{bn(p+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)^n*(a+b*exp(x)^n)^p,x, algorithm="giac")
```

```
[Out] (b*e^(n*x) + a)^(p + 1)/(b*n*(p + 1))
```

Mupad [B]
time = 3.51, size = 24, normalized size = 0.96

$$\frac{(a + b\,\mathrm{e}^{n\,x})^{p+1}}{b\,n\,(p+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)^n*(a + b*exp(x)^n)^p,x)
```

```
[Out] (a + b*exp(n*x))^(p + 1)/(b*n*(p + 1))
```

3.15 $\int e^{nx}(a+b(e^x)^n)^p\,dx$

Optimal. Leaf size=37

$$\frac{e^{nx}(e^x)^{-n}\left(a+b(e^x)^n\right)^{1+p}}{bn(1+p)}$$

[Out] exp(n*x)*(a+b*exp(x)^n)^(1+p)/b/(exp(x)^n)/n/(1+p)

Rubi [A]
time = 0.05, antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.176$, Rules used = {2279, 2278, 32}

$$\frac{e^{nx}(e^x)^{-n}\left(a+b(e^x)^n\right)^{p+1}}{bn(p+1)}$$

Antiderivative was successfully verified.

```
[In] Int[E^(n*x)*(a + b*(E^x)^n)^p,x]
```

```
[Out] (E^(n*x)*(a + b*(E^x)^n)^(1 + p))/(b*(E^x)^n*n*(1 + p))
```

Rule 32

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

Rule 2278

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rule 2279

```
Int[((a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.))^(p_.)*((G_)^((
h_.)*((f_.) + (g_.)*(x_))))^(m_.), x_Symbol] :> Dist[(G^(h*(f + g*x)))^m/(F
^(e*(c + d*x)))^n, Int[(F^(e*(c + d*x)))^n*(a + b*(F^(e*(c + d*x)))^n)^p, x
], x] /; FreeQ[{F, G, a, b, c, d, e, f, g, h, m, n, p}, x] && EqQ[d*e*n*Log
[F], g*h*m*Log[G]]
```

Rubi steps

$$\int e^{nx}(a+b(e^x)^n)^p\,dx = \left(e^{nx}(e^x)^{-n}\right)\int (e^x)^n\,(a+b(e^x)^n)^p\,dx$$
$$= \frac{\left(e^{nx}(e^x)^{-n}\right)\text{Subst}\left(\int (a+bx)^p\,dx, x, (e^x)^n\right)}{n}$$
$$= \frac{e^{nx}(e^x)^{-n}\,(a+b(e^x)^n)^{1+p}}{bn(1+p)}$$

Mathematica [A]
time = 0.03, size = 36, normalized size = 0.97

$$\frac{e^{nx}(e^x)^{-n}\,(a+b(e^x)^n)^{1+p}}{bn+bnp}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(n*x)*(a + b*(E^x)^n)^p,x]
```

```
[Out] (E^(n*x)*(a + b*(E^x)^n)^(1 + p))/((E^x)^n*(b*n + b*n*p))
```

Maple [A]
time = 0.02, size = 31, normalized size = 0.84

method	result	size
risch	$\frac{(a+b\,\mathrm{e}^{nx})(a+b\,\mathrm{e}^{nx})^p}{bn(1+p)}$	31
norman	$\frac{\mathrm{e}^{nx}\mathrm{e}^{p\ln(a+b\,\mathrm{e}^{nx})}}{n(1+p)}+\frac{a\,\mathrm{e}^{p\ln(a+b\,\mathrm{e}^{nx})}}{bn(1+p)}$	52

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(n*x)*(a+b*exp(x)^n)^p,x,method=_RETURNVERBOSE)
```

```
[Out] (a+b*exp(n*x))/b/n/(1+p)*(a+b*exp(n*x))^p
```

Maxima [A]
time = 0.30, size = 24, normalized size = 0.65

$$\frac{\left(be^{(nx)}+a\right)^{p+1}}{bn(p+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(n*x)*(a+b*exp(x)^n)^p,x, algorithm="maxima")
```

```
[Out] (b*e^(n*x) + a)^(p + 1)/(b*n*(p + 1))
```

Fricas [A]
time = 0.37, size = 29, normalized size = 0.78

$$\frac{\left(be^{(nx)} + a\right)\left(be^{(nx)} + a\right)^{p}}{bnp + bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(n*x)*(a+b*exp(x)^n)^p,x, algorithm="fricas")
[Out] (b*e^(n*x) + a)*(b*e^(n*x) + a)^p/(b*n*p + b*n)
```

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

$$\int \left(a + b(e^{x})^{n}\right)^{p} e^{nx}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(n*x)*(a+b*exp(x)**n)**p,x)
[Out] Integral((a + b*exp(x)**n)**p*exp(n*x), x)
```

Giac [A]
time = 3.16, size = 24, normalized size = 0.65

$$\frac{\left(be^{(nx)} + a\right)^{p+1}}{bn(p+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(n*x)*(a+b*exp(x)^n)^p,x, algorithm="giac")
[Out] (b*e^(n*x) + a)^(p + 1)/(b*n*(p + 1))
```

Mupad [B]
time = 3.44, size = 24, normalized size = 0.65

$$\frac{\left(a + b\,\mathrm{e}^{n\,x}\right)^{p+1}}{b\,n\,\left(p+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(n*x)*(a + b*exp(x)^n)^p,x)
[Out] (a + b*exp(n*x))^(p + 1)/(b*n*(p + 1))
```

3.16 $\int \left(F^{e(c+dx)}\right)^n \left(a+b\left(F^{e(c+dx)}\right)^n\right)^p \, dx$

Optimal. Leaf size=41

$$\frac{\left(a+b\left(F^{e(c+dx)}\right)^n\right)^{1+p}}{bden(1+p)\log(F)}$$

[Out] (a+b*(F^(e*(d*x+c)))^n)^(1+p)/b/d/e/n/(1+p)/ln(F)

Rubi [A]
time = 0.05, antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.069$, Rules used = {2278, 32}

$$\frac{\left(a+b\left(F^{e(c+dx)}\right)^n\right)^{p+1}}{bden(p+1)\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[(F^(e*(c + d*x)))^n*(a + b*(F^(e*(c + d*x)))^n)^p,x]
```

```
[Out] (a + b*(F^(e*(c + d*x)))^n)^(1 + p)/(b*d*e*n*(1 + p)*Log[F])
```

Rule 32

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

Rule 2278

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rubi steps

$$\begin{aligned}\int \left(F^{e(c+dx)}\right)^n \left(a+b\left(F^{e(c+dx)}\right)^n\right)^p \, dx &= \frac{\text{Subst}\left(\int (a+bx)^p \, dx, x, \left(F^{e(c+dx)}\right)^n\right)}{den\log(F)} \\ &= \frac{\left(a+b\left(F^{e(c+dx)}\right)^n\right)^{1+p}}{bden(1+p)\log(F)}\end{aligned}$$

Mathematica [F]
time = 0.34, size = 0, normalized size = 0.00

$$\int \left(F^{e(c+dx)}\right)^n \left(a+b\left(F^{e(c+dx)}\right)^n\right)^p \, dx$$

Verification is not applicable to the result.

```
[In] Integrate[(F^(e*(c + d*x)))^n*(a + b*(F^(e*(c + d*x)))^n)^p,x]
```

```
[Out] Integrate[(F^(e*(c + d*x)))^n*(a + b*(F^(e*(c + d*x)))^n)^p, x]
```

Maple [A]
time = 0.04, size = 42, normalized size = 1.02

method	result	size
derivativedivides	$\frac{\left(a+b\left(F^{e(dx+c)}\right)^{n}\right)^{1+p}}{bden(1+p)\ln(F)}$	42
default	$\frac{\left(a+b\left(F^{e(dx+c)}\right)^{n}\right)^{1+p}}{bden(1+p)\ln(F)}$	42
risch	$\frac{\left(a+b\left(F^{e(dx+c)}\right)^{n}\right)\left(a+b\left(F^{e(dx+c)}\right)^{n}\right)^{p}}{b(1+p)\ln(F)edn}$	55

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((F^(e*(d*x+c)))^n*(a+b*(F^(e*(d*x+c)))^n)^p,x,method=_RETURNVERBOSE)
```

```
[Out] (a+b*(F^(e*(d*x+c)))^n)^(1+p)/b/d/e/n/(1+p)/ln(F)
```

Maxima [A]
time = 0.29, size = 40, normalized size = 0.98

$$\frac{\left(F^{(dx+c)en}b+a\right)^{p+1}}{bden(p+1)\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((F^(e*(d*x+c)))^n*(a+b*(F^(e*(d*x+c)))^n)^p,x, algorithm="maxima"
)
```

```
[Out] (F^((d*x + c)*e*n)*b + a)^(p + 1)/(b*d*e*n*(p + 1)*log(F))
```

Fricas [A]
time = 0.35, size = 55, normalized size = 1.34

$$\frac{\left(F^{(dnx+cn)e}b+a\right)\left(F^{(dnx+cn)e}b+a\right)^{p}e^{(-1)}}{(bdnp+bdn)\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((F^(e*(d*x+c)))^n*(a+b*(F^(e*(d*x+c)))^n)^p,x, algorithm="fricas"
)
```

```
[Out] (F^((d*n*x + c*n)*e)*b + a)*(F^((d*n*x + c*n)*e)*b + a)^p*e^(-1)/((b*d*n*p
+ b*d*n)*log(F))
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 90 vs. $2(29) = 58$.
time = 223.79, size = 90, normalized size = 2.20

$$\begin{cases} x(a+b(F^{ce})^n)^p (F^{ce})^n & \text{for } d=0 \\ x(a+b)^p & \text{for } e=0 \vee n=0 \vee \log(F)=0 \\ \frac{\begin{cases} a^p \left(F^{e(c+dx)}\right)^n & \text{for } b=0 \\ \frac{\begin{cases} \frac{\left(a+b\left(F^{e(c+dx)}\right)^n\right)^{p+1}}{p+1} & \text{for } p\neq -1 \\ \log\left(a+b\left(F^{e(c+dx)}\right)^n\right) & \text{otherwise} \end{cases}}{b} & \text{otherwise} \end{cases}}{den\log(F)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((F**(e*(d*x+c)))**n*(a+b*(F**(e*(d*x+c)))**n)**p,x)
```

```
[Out] Piecewise((x*(a + b*(F**(c*e))**n)**p*(F**(c*e))**n, Eq(d, 0)), (x*(a + b)*
*p, Eq(e, 0) | Eq(n, 0) | Eq(log(F), 0)), (Piecewise((a**p*(F**(e*(c + d*x)
))**n, Eq(b, 0)), (Piecewise(((a + b*(F**(e*(c + d*x)))**n)**(p + 1)/(p + 1
), Ne(p, -1)), (log(a + b*(F**(e*(c + d*x)))**n), True))/b, True))/(d*e*n*l
og(F)), True))
```

Giac [A]
time = 2.94, size = 43, normalized size = 1.05

$$\frac{\left(F^{dnxe+cne}b+a\right)^{p+1}e^{(-1)}}{bdn(p+1)\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((F^(e*(d*x+c)))^n*(a+b*(F^(e*(d*x+c)))^n)^p,x, algorithm="giac")
```

```
[Out] (F^(d*n*x*e + c*n*e)*b + a)^(p + 1)*e^(-1)/(b*d*n*(p + 1)*log(F))
```

Mupad [B]
time = 3.51, size = 74, normalized size = 1.80

$$\left(\frac{\left(F^{c\,e+d\,e\,x}\right)^n}{d\,e\,n\,\ln(F)\,(p+1)}+\frac{a}{b\,d\,e\,n\,\ln(F)\,(p+1)}\right)\,\left(a+b\,\left(F^{c\,e+d\,e\,x}\right)^n\right)^p$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((F^(e*(c + d*x)))^n*(a + b*(F^(e*(c + d*x)))^n)^p,x)
```

```
[Out] ((F^(c*e + d*e*x))^n/(d*e*n*log(F)*(p + 1)) + a/(b*d*e*n*log(F)*(p + 1)))*(
a + b*(F^(c*e + d*e*x))^n)^p
```

3.17 $\int \left(a+b\left(F^{e(c+dx)}\right)^n\right)^p \left(G^{h(f+gx)}\right)^{\frac{den\log(F)}{gh\log(G)}}\,dx$

Optimal. Leaf size=80

$$\frac{\left(F^{e(c+dx)}\right)^{-n}\left(a+b\left(F^{e(c+dx)}\right)^n\right)^{1+p}\left(G^{h(f+gx)}\right)^{\frac{den\log(F)}{gh\log(G)}}}{bden(1+p)\log(F)}$$

```
[Out] (a+b*(F^(e*(d*x+c)))^n)^(1+p)*(G^(h*(g*x+f)))^(d*e*n*ln(F)/g/h/ln(G))/b/d/e
/((F^(e*(d*x+c)))^n)/n/(1+p)/ln(F)
```

Rubi [A]
time = 0.09, antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 44, $\frac{\text{number of rules}}{\text{integrand size}} = 0.068$, Rules used = {2279, 2278, 32}

$$\frac{\left(F^{e(c+dx)}\right)^{-n}\left(a+b\left(F^{e(c+dx)}\right)^n\right)^{p+1}\left(G^{h(f+gx)}\right)^{\frac{den\log(F)}{gh\log(G)}}}{bden(p+1)\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*(F^(e*(c + d*x)))^n)^p*(G^(h*(f + g*x)))^((d*e*n*Log[F])/(g*h*Lo
g[G])),x]
```

```
[Out] ((a + b*(F^(e*(c + d*x)))^n)^(1 + p)*(G^(h*(f + g*x)))^((d*e*n*Log[F])/(g*h
*Log[G])))/(b*d*e*(F^(e*(c + d*x)))^n*n*(1 + p)*Log[F])
```

Rule 32

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

Rule 2278

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rule 2279

```
Int[((a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.))^(p_.)*((G_)^((
h_.)*((f_.) + (g_.)*(x_))))^(m_.), x_Symbol] :> Dist[(G^(h*(f + g*x)))^m/(F
^(e*(c + d*x)))^n, Int[(F^(e*(c + d*x)))^n*(a + b*(F^(e*(c + d*x)))^n)^p, x
], x] /; FreeQ[{F, G, a, b, c, d, e, f, g, h, m, n, p}, x] && EqQ[d*e*n*Log
[F], g*h*m*Log[G]]
```

Rubi steps

$$\int \left(a+b\left(F^{e(c+dx)}\right)^n\right)^p \left(G^{h(f+gx)}\right)^{\frac{den\log(F)}{gh\log(G)}}\,dx = \left(\left(F^{e(c+dx)}\right)^{-n}\left(G^{h(f+gx)}\right)^{\frac{den\log(F)}{gh\log(G)}}\right)\int \left(F^{e(c+dx)}\right)^n\left(a+b\left(F\right.\right.$$

$$= \frac{\left(\left(F^{e(c+dx)}\right)^{-n}\left(G^{h(f+gx)}\right)^{\frac{den\log(F)}{gh\log(G)}}\right)\operatorname{Subst}\left(\int(a+bx)^p\,dx,x,\right.}{den\log(F)}$$

$$= \frac{\left(F^{e(c+dx)}\right)^{-n}\left(a+b\left(F^{e(c+dx)}\right)^n\right)^{1+p}\left(G^{h(f+gx)}\right)^{\frac{den\log(F)}{gh\log(G)}}}{bden(1+p)\log(F)}$$

Mathematica [F]
time = 0.35, size = 0, normalized size = 0.00

$$\int \left(a+b\left(F^{e(c+dx)}\right)^n\right)^p \left(G^{h(f+gx)}\right)^{\frac{den\log(F)}{gh\log(G)}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a + b*(F^(e*(c + d*x)))^n)^p*(G^(h*(f + g*x)))^((d*e*n*Log[F])/(
g*h*Log[G])),x]
```

```
[Out] Integrate[(a + b*(F^(e*(c + d*x)))^n)^p*(G^(h*(f + g*x)))^((d*e*n*Log[F])/(
g*h*Log[G])), x]
```

Maple [F]
time = 0.23, size = 0, normalized size = 0.00

$$\int \left(a+b\left(F^{e(dx+c)}\right)^n\right)^p \left(G^{h(gx+f)}\right)^{\frac{den\ln(F)}{gh\ln(G)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*(F^(e*(d*x+c)))^n)^p*(G^(h*(g*x+f)))^(d*e*n*ln(F)/g/h/ln(G)),x)
```

```
[Out] int((a+b*(F^(e*(d*x+c)))^n)^p*(G^(h*(g*x+f)))^(d*e*n*ln(F)/g/h/ln(G)),x)
```

Maxima [A]
time = 0.31, size = 86, normalized size = 1.08

$$\frac{\left(F^{denx}F^{cen+\frac{defn}{g}}b+F^{\frac{defn}{g}}a\right)\left(F^{denx}F^{cen}b+a\right)^p}{F^{cen}bden(p+1)\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*(F^(e*(d*x+c)))^n)^p*(G^(h*(g*x+f)))^(d*e*n*log(F)/g/h/log(G
)),x, algorithm="maxima")
```

```
[Out] (F^(d*e*n*x)*F^(c*e*n + d*e*f*n/g)*b + F^(d*e*f*n/g)*a)*(F^(d*e*n*x)*F^(c*e
*n)*b + a)^p/(F^(c*e*n)*b*d*e*n*(p + 1)*log(F))
```

Fricas [A]
time = 0.41, size = 90, normalized size = 1.12

$$\frac{\left(F^{(dnx+cn)e}F^{\frac{(df-cg)ne}{g}}b+F^{\frac{(df-cg)ne}{g}}a\right)\left(F^{(dnx+cn)e}b+a\right)^{p}e^{(-1)}}{(bdnp+bdn)\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*(F^(e*(d*x+c)))^n)^p*(G^(h*(g*x+f)))^(d*e*n*log(F)/g/h/log(G
)),x, algorithm="fricas")
```

```
[Out] (F^((d*n*x + c*n)*e)*F^((d*f - c*g)*n*e/g)*b + F^((d*f - c*g)*n*e/g)*a)*(F^
((d*n*x + c*n)*e)*b + a)^p*e^(-1)/((b*d*n*p + b*d*n)*log(F))
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*(F**(e*(d*x+c)))**n)**p*(G**(h*(g*x+f)))**(d*e*n*ln(F)/g/h/l
n(G)),x)
```

```
[Out] Timed out
```

Giac [A]
time = 2.95, size = 156, normalized size = 1.95

$$\frac{F^{\frac{dfne}{g}}be^{\left(2\,dnxe\log(F)+cne\log(F)+p\log\left(be^{(dnxe\log(F)+cne\log(F))}+a\right)\right)}+F^{\frac{dfne}{g}}ae^{\left(dnxe\log(F)+p\log\left(be^{(dnxe\log(F)+cne\log(F))}+a\right)\right)}}{bdnpe^{(dnxe\log(F)+cne\log(F)+1)}\log\left(F\right)+bdne^{(dnxe\log(F)+cne\log(F)+1)}\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*(F^(e*(d*x+c)))^n)^p*(G^(h*(g*x+f)))^(d*e*n*log(F)/g/h/log(G
)),x, algorithm="giac")
```

```
[Out] (F^(d*f*n*e/g)*b*e^(2*d*n*x*e*log(F) + c*n*e*log(F) + p*log(b*e^(d*n*x*e*lo
g(F) + c*n*e*log(F)) + a)) + F^(d*f*n*e/g)*a*e^(d*n*x*e*log(F) + p*log(b*e^
(d*n*x*e*log(F) + c*n*e*log(F)) + a)))/(b*d*n*p*e^(d*n*x*e*log(F) + c*n*e*l
og(F) + 1)*log(F) + b*d*n*e^(d*n*x*e*log(F) + c*n*e*log(F) + 1)*log(F))
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \left(G^{h\,(f+g\,x)}\right)^{\frac{d\,e\,n\,\ln(F)}{g\,h\,\ln(G)}}\,\left(a+b\,\left(F^{e\,(c+d\,x)}\right)^n\right)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((G^(h*(f + g*x)))^((d*e*n*log(F))/(g*h*log(G)))*(a + b*(F^(e*(c + d*x))
)^n)^p,x)
```

```
[Out] int((G^(h*(f + g*x)))^((d*e*n*log(F))/(g*h*log(G)))*(a + b*(F^(e*(c + d*x))
)^n)^p, x)
```

3.18 $\int \frac{e^{2x}}{a+be^x}\,dx$

Optimal. Leaf size=22

$$\frac{e^x}{b}-\frac{a\log\left(a+be^x\right)}{b^2}$$

[Out] exp(x)/b-a*ln(a+b*exp(x))/b^2

Rubi [A]
time = 0.02, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}=0.133$, Rules used = {2280, 45}

$$\frac{e^x}{b}-\frac{a\log\left(a+be^x\right)}{b^2}$$

Antiderivative was successfully verified.

[In] Int[E^(2*x)/(a + b*E^x),x]

[Out] E^x/b - (a*Log[a + b*E^x])/b^2

Rule 45

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

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{2x}}{a+be^x}\,dx &= \text{Subst}\left(\int \frac{x}{a+bx}\,dx,x,e^x\right)\\ &= \text{Subst}\left(\int \left(\frac{1}{b}-\frac{a}{b(a+bx)}\right)\,dx,x,e^x\right)\\ &= \frac{e^x}{b}-\frac{a\log\left(a+be^x\right)}{b^2}\end{aligned}$$

Mathematica [A]
time = 0.02, size = 22, normalized size = 1.00

$$\frac{e^x}{b} - \frac{a\log(a + be^x)}{b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(2*x)/(a + b*E^x),x]
```

```
[Out] E^x/b - (a*Log[a + b*E^x])/b^2
```

Maple [A]
time = 0.02, size = 21, normalized size = 0.95

method	result	size
default	$\frac{e^x}{b} - \frac{a\ln(a+b\,e^x)}{b^2}$	21
norman	$\frac{e^x}{b} - \frac{a\ln(a+b\,e^x)}{b^2}$	21
risch	$\frac{e^x}{b} - \frac{a\ln(e^x+\frac{a}{b})}{b^2}$	23

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(a+b*exp(x)),x,method=_RETURNVERBOSE)
```

```
[Out] exp(x)/b-a*ln(a+b*exp(x))/b^2
```

Maxima [A]
time = 0.28, size = 20, normalized size = 0.91

$$\frac{e^x}{b} - \frac{a\log(be^x + a)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x)),x, algorithm="maxima")
```

```
[Out] e^x/b - a*log(b*e^x + a)/b^2
```

Fricas [A]
time = 0.40, size = 19, normalized size = 0.86

$$\frac{be^x - a\log(be^x + a)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x)),x, algorithm="fricas")
```

```
[Out] (b*e^x - a*log(b*e^x + a))/b^2
```

Sympy [A]
time = 0.05, size = 20, normalized size = 0.91

$$-\frac{a\log\left(\frac{a}{b}+e^{x}\right)}{b^{2}}+\begin{cases}\frac{e^{x}}{b} & \text{for } b\neq 0\\ \frac{x}{b} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x)),x)
[Out] -a*log(a/b + exp(x))/b**2 + Piecewise((exp(x)/b, Ne(b, 0)), (x/b, True))
```

Giac [A]
time = 2.96, size = 21, normalized size = 0.95

$$\frac{e^{x}}{b}-\frac{a\log\left(|be^{x}+a|\right)}{b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x)),x, algorithm="giac")
[Out] e^x/b - a*log(abs(b*e^x + a))/b^2
```

Mupad [B]
time = 3.57, size = 20, normalized size = 0.91

$$-\frac{a\,\ln\left(a+b\,\mathrm{e}^{x}\right)-b\,\mathrm{e}^{x}}{b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(a + b*exp(x)),x)
[Out] -(a*log(a + b*exp(x)) - b*exp(x))/b^2
```

3.19 $\int \frac{e^{2x}}{(a+be^x)^2} \, dx$

Optimal. Leaf size=27

$$\frac{a}{b^2\left(a+be^x\right)}+\frac{\log\left(a+be^x\right)}{b^2}$$

```
[Out] a/b^2/(a+b*exp(x))+ln(a+b*exp(x))/b^2
```

Rubi [A]
time = 0.02, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {2280, 45}

$$\frac{a}{b^2\left(a+be^x\right)}+\frac{\log\left(a+be^x\right)}{b^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(2*x)/(a + b*E^x)^2,x]
```

```
[Out] a/(b^2*(a + b*E^x)) + Log[a + b*E^x]/b^2
```

Rule 45

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

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{e^{2x}}{\left(a+be^x\right)^2}\,dx &= \text{Subst}\left(\int \frac{x}{(a+bx)^2}\,dx,x,e^x\right)\\
&= \text{Subst}\left(\int \left(-\frac{a}{b(a+bx)^2}+\frac{1}{b(a+bx)}\right)\,dx,x,e^x\right)\\
&= \frac{a}{b^2\left(a+be^x\right)}+\frac{\log\left(a+be^x\right)}{b^2}
\end{aligned}$$

Mathematica [A]
time = 0.04, size = 26, normalized size = 0.96

$$\frac{\frac{a}{a+be^x}+\log\left(b(a+be^x)\right)}{b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(2*x)/(a + b*E^x)^2,x]
[Out] (a/(a + b*E^x) + Log[b*(a + b*E^x)])/b^2
```

Maple [A]
time = 0.01, size = 26, normalized size = 0.96

method	result	size
default	$\frac{a}{b^2(a+b\,\mathrm{e}^x)}+\frac{\ln(a+b\,\mathrm{e}^x)}{b^2}$	26
norman	$\frac{a}{b^2(a+b\,\mathrm{e}^x)}+\frac{\ln(a+b\,\mathrm{e}^x)}{b^2}$	26
risch	$\frac{a}{b^2(a+b\,\mathrm{e}^x)}+\frac{\ln(\mathrm{e}^x+\frac{a}{b})}{b^2}$	28

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(a+b*exp(x))^2,x,method=_RETURNVERBOSE)
[Out] a/b^2/(a+b*exp(x))+ln(a+b*exp(x))/b^2
```

Maxima [A]
time = 0.29, size = 28, normalized size = 1.04

$$\frac{a}{b^3e^x+ab^2}+\frac{\log\left(be^x+a\right)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x))^2,x, algorithm="maxima")
[Out] a/(b^3*e^x + a*b^2) + log(b*e^x + a)/b^2
```

Fricas [A]
time = 0.37, size = 31, normalized size = 1.15

$$\frac{(be^x+a)\log\left(be^x+a\right)+a}{b^3e^x+ab^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((b*e^x + a)*log(b*e^x + a) + a)/(b^3*e^x + a*b^2)
```

Sympy [**A**]
time = 0.05, size = 24, normalized size = 0.89

$$\frac{a}{ab^2+b^3e^x}+\frac{\log\left(\frac{a}{b}+e^x\right)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x))**2,x)
```

```
[Out] a/(a*b**2 + b**3*exp(x)) + log(a/b + exp(x))/b**2
```

Giac [**A**]
time = 3.32, size = 26, normalized size = 0.96

$$\frac{\log\left(|be^x+a|\right)}{b^2}+\frac{a}{(be^x+a)b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] log(abs(b*e^x + a))/b^2 + a/((b*e^x + a)*b^2)
```

Mupad [**B**]
time = 3.61, size = 27, normalized size = 1.00

$$\frac{\ln\left(a+b\,\mathrm{e}^x\right)}{b^2}-\frac{\mathrm{e}^x}{b\,\left(a+b\,\mathrm{e}^x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(a + b*exp(x))^2,x)
```

```
[Out] log(a + b*exp(x))/b^2 - exp(x)/(b*(a + b*exp(x)))
```

3.20 $\int \frac{e^{2x}}{(a+be^x)^3}\,dx$

Optimal. Leaf size=21

$$\frac{e^{2x}}{2a\,(a+be^x)^2}$$

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

Rubi [A]
time = 0.02, antiderivative size = 21, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {2280, 37}

$$\frac{e^{2x}}{2a\,(a+be^x)^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(2*x)/(a + b*E^x)^3,x]
```

```
[Out] E^(2*x)/(2*a*(a + b*E^x)^2)
```

Rule 37

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

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{2x}}{(a+be^x)^3}\,dx &= \text{Subst}\left(\int \frac{x}{(a+bx)^3}\,dx, x, e^x\right)\\ &= \frac{e^{2x}}{2a\,(a+be^x)^2}\end{aligned}$$

Mathematica [A]
time = 0.03, size = 26, normalized size = 1.24

$$\frac{-a-2be^x}{2b^2\left(a+be^x\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(2*x)/(a + b*E^x)^3,x]
```

```
[Out] (-a - 2*b*E^x)/(2*b^2*(a + b*E^x)^2)
```

Maple [A]
time = 0.02, size = 29, normalized size = 1.38

method	result	size
risch	$-\frac{2b\,\mathrm{e}^{x}+a}{2b^{2}\left(a+b\,\mathrm{e}^{x}\right)^{2}}$	21
norman	$\frac{-\frac{\mathrm{e}^{x}}{b}-\frac{a}{2b^{2}}}{\left(a+b\,\mathrm{e}^{x}\right)^{2}}$	24
default	$-\frac{1}{b^{2}\left(a+b\,\mathrm{e}^{x}\right)}+\frac{a}{2b^{2}\left(a+b\,\mathrm{e}^{x}\right)^{2}}$	29

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(a+b*exp(x))^3,x,method=_RETURNVERBOSE)
```

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

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 61 vs. $2(17) = 34$.
time = 0.31, size = 61, normalized size = 2.90

$$-\frac{be^x}{b^4e^{(2x)}+2ab^3e^x+a^2b^2}-\frac{a}{2\left(b^4e^{(2x)}+2ab^3e^x+a^2b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x))^3,x, algorithm="maxima")
```

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

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 35 vs. $2(17) = 34$.
time = 0.36, size = 35, normalized size = 1.67

$$-\frac{2\,be^x+a}{2\left(b^4e^{(2x)}+2\,ab^3e^x+a^2b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x))^3,x, algorithm="fricas")
```

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

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 37 vs. $2(15) = 30$.
time = 0.05, size = 37, normalized size = 1.76

$$\frac{-a - 2be^x}{2a^2b^2 + 4ab^3e^x + 2b^4e^{2x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x))**3,x)
```

```
[Out] (-a - 2*b*exp(x))/(2*a**2*b**2 + 4*a*b**3*exp(x) + 2*b**4*exp(2*x))
```

Giac [A]
time = 3.67, size = 20, normalized size = 0.95

$$-\frac{2\,be^x + a}{2\,(be^x + a)^2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x))^3,x, algorithm="giac")
```

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

Mupad [B]
time = 3.56, size = 29, normalized size = 1.38

$$\frac{e^{2\,x}}{2\,a\,\left(a^2 + 2\,e^x\,a\,b + e^{2\,x}\,b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(a + b*exp(x))^3,x)
```

```
[Out] exp(2*x)/(2*a*(b^2*exp(2*x) + a^2 + 2*a*b*exp(x)))
```

3.21 $\int \frac{e^{2x}}{(a+be^x)^4}\,dx$

Optimal. Leaf size=34

$$\frac{a}{3b^2\,(a+be^x)^3}-\frac{1}{2b^2\,(a+be^x)^2}$$

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

Rubi [A]
time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2280, 45}

$$\frac{a}{3b^2\,(a+be^x)^3}-\frac{1}{2b^2\,(a+be^x)^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(2*x)/(a + b*E^x)^4,x]
```

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

Rule 45

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

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{2x}}{(a+be^x)^4}\,dx &= \text{Subst}\left(\int \frac{x}{(a+bx)^4}\,dx,x,e^x\right)\\ &= \text{Subst}\left(\int \left(-\frac{a}{b(a+bx)^4}+\frac{1}{b(a+bx)^3}\right)\,dx,x,e^x\right)\\ &= \frac{a}{3b^2\,(a+be^x)^3}-\frac{1}{2b^2\,(a+be^x)^2}\end{aligned}$$

Mathematica [A]
time = 0.03, size = 26, normalized size = 0.76

$$\frac{-a - 3be^x}{6b^2 (a + be^x)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(2*x)/(a + b*E^x)^4,x]
```

```
[Out] (-a - 3*b*E^x)/(6*b^2*(a + b*E^x)^3)
```

Maple [A]
time = 0.02, size = 29, normalized size = 0.85

method	result	size
risch	$-\frac{3b\,\mathrm{e}^x+a}{6b^2(a+b\,\mathrm{e}^x)^3}$	21
norman	$\frac{-\frac{a}{6b^2}-\frac{\mathrm{e}^x}{2b}}{(a+b\,\mathrm{e}^x)^3}$	24
default	$\frac{a}{3b^2(a+b\,\mathrm{e}^x)^3}-\frac{1}{2b^2(a+b\,\mathrm{e}^x)^2}$	29

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(a+b*exp(x))^4,x,method=_RETURNVERBOSE)
```

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

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 85 vs. 2(28) = 56.
time = 0.27, size = 85, normalized size = 2.50

$$-\frac{be^x}{2\left(b^5e^{(3\,x)} + 3\,ab^4e^{(2\,x)} + 3\,a^2b^3e^x + a^3b^2\right)} - \frac{a}{6\left(b^5e^{(3\,x)} + 3\,ab^4e^{(2\,x)} + 3\,a^2b^3e^x + a^3b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x))^4,x, algorithm="maxima")
```

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

Fricas [A]
time = 0.39, size = 47, normalized size = 1.38

$$-\frac{3\,be^x + a}{6\left(b^5e^{(3\,x)} + 3\,ab^4e^{(2\,x)} + 3\,a^2b^3e^x + a^3b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x))^4,x, algorithm="fricas")
```

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

Sympy [A]
time = 0.06, size = 51, normalized size = 1.50

$$\frac{-a - 3be^x}{6a^3b^2 + 18a^2b^3e^x + 18ab^4e^{2x} + 6b^5e^{3x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x))**4,x)
```

```
[Out] (-a - 3*b*exp(x))/(6*a**3*b**2 + 18*a**2*b**3*exp(x) + 18*a*b**4*exp(2*x) +
 6*b**5*exp(3*x))
```

Giac [A]
time = 3.56, size = 20, normalized size = 0.59

$$-\frac{3\,be^x + a}{6\,(be^x + a)^3b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x))^4,x, algorithm="giac")
```

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

Mupad [B]
time = 3.60, size = 53, normalized size = 1.56

$$\frac{\frac{\mathrm{e}^{2\,x}}{2\,a} + \frac{b\,\mathrm{e}^{3\,x}}{6\,a^2}}{a^3 + 3\,\mathrm{e}^x\,a^2\,b + 3\,\mathrm{e}^{2\,x}\,a\,b^2 + \mathrm{e}^{3\,x}\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(a + b*exp(x))^4,x)
```

```
[Out] (exp(2*x)/(2*a) + (b*exp(3*x))/(6*a^2))/(b^3*exp(3*x) + a^3 + 3*a^2*b*exp(x
) + 3*a*b^2*exp(2*x))
```

3.22 $\int \frac{e^{4x}}{a+be^{2x}}\,dx$

Optimal. Leaf size=31

$$\frac{e^{2x}}{2b}-\frac{a\log\left(a+be^{2x}\right)}{2b^2}$$

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

Rubi [A]

time = 0.02, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$, Rules used = {2280, 45}

$$\frac{e^{2x}}{2b}-\frac{a\log\left(a+be^{2x}\right)}{2b^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(4*x)/(a + b*E^(2*x)),x]
```

```
[Out] E^(2*x)/(2*b) - (a*Log[a + b*E^(2*x)])/(2*b^2)
```

Rule 45

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

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{4x}}{a+be^{2x}}\,dx&=\frac{1}{2}\text{Subst}\left(\int \frac{x}{a+bx}\,dx,x,e^{2x}\right)\\&=\frac{1}{2}\text{Subst}\left(\int \left(\frac{1}{b}-\frac{a}{b(a+bx)}\right)\,dx,x,e^{2x}\right)\\&=\frac{e^{2x}}{2b}-\frac{a\log\left(a+be^{2x}\right)}{2b^2}\end{aligned}$$

Mathematica [A]
time = 0.02, size = 28, normalized size = 0.90

$$\frac{be^{2x} - a\log\left(a + be^{2x}\right)}{2b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(4*x)/(a + b*E^(2*x)),x]
```

```
[Out] (b*E^(2*x) - a*Log[a + b*E^(2*x)])/(2*b^2)
```

Maple [A]
time = 0.01, size = 26, normalized size = 0.84

method	result	size
default	$\frac{e^{2x}}{2b} - \frac{a\ln\left(a+b\,e^{2x}\right)}{2b^2}$	26
norman	$\frac{e^{2x}}{2b} - \frac{a\ln\left(a+b\,e^{2x}\right)}{2b^2}$	26
risch	$\frac{e^{2x}}{2b} - \frac{a\ln\left(e^{2x}+\frac{a}{b}\right)}{2b^2}$	28

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x)/(a+b*exp(2*x)),x,method=_RETURNVERBOSE)
```

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

Maxima [A]
time = 0.32, size = 25, normalized size = 0.81

$$\frac{e^{(2\,x)}}{2\,b} - \frac{a\log\left(be^{(2\,x)} + a\right)}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x)),x, algorithm="maxima")
```

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

Fricas [A]
time = 0.44, size = 24, normalized size = 0.77

$$\frac{be^{(2\,x)} - a\log\left(be^{(2\,x)} + a\right)}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x)),x, algorithm="fricas")
```

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

Sympy [A]
time = 0.07, size = 27, normalized size = 0.87

$$-\frac{a\log\left(\frac{a}{b}+e^{2x}\right)}{2b^2}+\begin{cases}\frac{e^{2x}}{2b} & \text{for } b\neq 0\\ \frac{x}{b} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x)),x)
```

```
[Out] -a*log(a/b + exp(2*x))/(2*b**2) + Piecewise((exp(2*x)/(2*b), Ne(b, 0)), (x/
b, True))
```

Giac [A]
time = 2.86, size = 26, normalized size = 0.84

$$\frac{e^{(2x)}}{2b}-\frac{a\log\left(\left|be^{(2x)}+a\right|\right)}{2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x)),x, algorithm="giac")
```

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

Mupad [B]
time = 0.07, size = 24, normalized size = 0.77

$$-\frac{a\ln\left(a+b\,\mathrm{e}^{2x}\right)-b\,\mathrm{e}^{2x}}{2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x)/(a + b*exp(2*x)),x)
```

```
[Out] -(a*log(a + b*exp(2*x)) - b*exp(2*x))/(2*b^2)
```

3.23 $\int \frac{e^{4x}}{(a+be^{2x})^2} \, dx$

Optimal. Leaf size=37

$$\frac{a}{2b^2\left(a+be^{2x}\right)}+\frac{\log\left(a+be^{2x}\right)}{2b^2}$$

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

Rubi [A]

time = 0.03, antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$, Rules used = {2280, 45}

$$\frac{a}{2b^2\left(a+be^{2x}\right)}+\frac{\log\left(a+be^{2x}\right)}{2b^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(4*x)/(a + b*E^(2*x))^2,x]
```

```
[Out] a/(2*b^2*(a + b*E^(2*x))) + Log[a + b*E^(2*x)]/(2*b^2)
```

Rule 45

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

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{e^{4x}}{\left(a+be^{2x}\right)^2} \, dx &= \frac{1}{2}\text{Subst}\left(\int \frac{x}{(a+bx)^2} \, dx, x, e^{2x}\right)\\
&= \frac{1}{2}\text{Subst}\left(\int \left(-\frac{a}{b(a+bx)^2}+\frac{1}{b(a+bx)}\right) \, dx, x, e^{2x}\right)\\
&= \frac{a}{2b^2\left(a+be^{2x}\right)}+\frac{\log\left(a+be^{2x}\right)}{2b^2}
\end{aligned}$$

Mathematica [A]
time = 0.04, size = 33, normalized size = 0.89

$$\frac{\frac{a}{a+be^{2x}}+\log\left(b\left(a+be^{2x}\right)\right)}{2b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(4*x)/(a + b*E^(2*x))^2,x]
```

```
[Out] (a/(a + b*E^(2*x)) + Log[b*(a + b*E^(2*x))])/(2*b^2)
```

Maple [A]
time = 0.01, size = 32, normalized size = 0.86

method	result	size
default	$\frac{a}{2b^2(a+b\,e^{2x})}+\frac{\ln(a+b\,e^{2x})}{2b^2}$	32
norman	$\frac{a}{2b^2(a+b\,e^{2x})}+\frac{\ln(a+b\,e^{2x})}{2b^2}$	32
risch	$\frac{a}{2b^2(a+b\,e^{2x})}+\frac{\ln(e^{2x}+\frac{a}{b})}{2b^2}$	34

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x)/(a+b*exp(2*x))^2,x,method=_RETURNVERBOSE)
```

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

Maxima [A]
time = 0.28, size = 34, normalized size = 0.92

$$\frac{a}{2\left(b^3e^{(2\,x)}+ab^2\right)}+\frac{\log\left(be^{(2\,x)}+a\right)}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))^2,x, algorithm="maxima")
```

```
[Out] 1/2*a/(b^3*e^(2*x) + a*b^2) + 1/2*log(b*e^(2*x) + a)/b^2
```

Fricas [A]
time = 0.46, size = 38, normalized size = 1.03

$$\frac{\left(be^{(2\,x)}+a\right)\log\left(be^{(2\,x)}+a\right)+a}{2\left(b^3e^{(2\,x)}+ab^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))^2,x, algorithm="fricas")
```

```
[Out] 1/2*((b*e^(2*x) + a)*log(b*e^(2*x) + a) + a)/(b^3*e^(2*x) + a*b^2)
```

Sympy [A]
time = 0.06, size = 32, normalized size = 0.86

$$\frac{a}{2ab^2 + 2b^3e^{2x}} + \frac{\log\left(\frac{a}{b} + e^{2x}\right)}{2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))**2,x)
```

```
[Out] a/(2*a*b**2 + 2*b**3*exp(2*x)) + log(a/b + exp(2*x))/(2*b**2)
```

Giac [A]
time = 3.49, size = 32, normalized size = 0.86

$$\frac{\log\left(\left|be^{(2x)} + a\right|\right)}{2\,b^2} + \frac{a}{2\,(be^{(2x)} + a)b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))^2,x, algorithm="giac")
```

```
[Out] 1/2*log(abs(b*e^(2*x) + a))/b^2 + 1/2*a/((b*e^(2*x) + a)*b^2)
```

Mupad [B]
time = 3.55, size = 34, normalized size = 0.92

$$\frac{\ln\left(a + b\,e^{2\,x}\right)}{2\,b^2} - \frac{e^{2\,x}}{2\,b\,\left(a + b\,e^{2\,x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x)/(a + b*exp(2*x))^2,x)
```

```
[Out] log(a + b*exp(2*x))/(2*b^2) - exp(2*x)/(2*b*(a + b*exp(2*x)))
```

3.24 $\int \frac{e^{4x}}{\left(a+be^{2x}\right)^3}\,dx$

Optimal. Leaf size=23

$$\frac{e^{4x}}{4a\left(a+be^{2x}\right)^2}$$

[Out] 1/4*exp(4*x)/a/(a+b*exp(2*x))^2

Rubi [A]
time = 0.02, antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2280, 37}

$$\frac{e^{4x}}{4a\left(a+be^{2x}\right)^2}$$

Antiderivative was successfully verified.

[In] Int[E^(4*x)/(a + b*E^(2*x))^3,x]

[Out] E^(4*x)/(4*a*(a + b*E^(2*x))^2)

Rule 37

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

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{4x}}{\left(a+be^{2x}\right)^3}\,dx &= \frac{1}{2}\text{Subst}\left(\int \frac{x}{(a+bx)^3}\,dx, x, e^{2x}\right)\\ &= \frac{e^{4x}}{4a\left(a+be^{2x}\right)^2}\end{aligned}$$

Mathematica [A]
time = 0.03, size = 30, normalized size = 1.30

$$\frac{-a-2be^{2x}}{4b^2\left(a+be^{2x}\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(4*x)/(a + b*E^(2*x))^3,x]
```

```
[Out] (-a - 2*b*E^(2*x))/(4*b^2*(a + b*E^(2*x))^2)
```

Maple [A]
time = 0.01, size = 33, normalized size = 1.43

method	result	size
risch	$-\frac{2b\,e^{2x}+a}{4b^2(a+b\,e^{2x})^2}$	25
norman	$\frac{-\frac{a}{4b^2}-\frac{e^{2x}}{2b}}{(a+b\,e^{2x})^2}$	28
default	$-\frac{1}{2b^2(a+b\,e^{2x})}+\frac{a}{4b^2(a+b\,e^{2x})^2}$	33

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x)/(a+b*exp(2*x))^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2/b^2/(a+b*exp(x)^2)+1/4*a/b^2/(a+b*exp(x)^2)^2
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 67 vs. 2(19) = 38.
time = 0.29, size = 67, normalized size = 2.91

$$-\frac{be^{(2x)}}{2\left(b^4e^{(4x)}+2ab^3e^{(2x)}+a^2b^2\right)}-\frac{a}{4\left(b^4e^{(4x)}+2ab^3e^{(2x)}+a^2b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))^3,x, algorithm="maxima")
```

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

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 39 vs. 2(19) = 38.
time = 0.38, size = 39, normalized size = 1.70

$$-\frac{2\,be^{(2x)}+a}{4\left(b^4e^{(4x)}+2\,ab^3e^{(2x)}+a^2b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))^3,x, algorithm="fricas")
```

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

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 41 vs. $2(17) = 34$.
time = 0.05, size = 41, normalized size = 1.78

$$\frac{-a - 2be^{2x}}{4a^2b^2 + 8ab^3e^{2x} + 4b^4e^{4x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))**3,x)
```

```
[Out] (-a - 2*b*exp(2*x))/(4*a**2*b**2 + 8*a*b**3*exp(2*x) + 4*b**4*exp(4*x))
```

Giac [A]
time = 3.18, size = 24, normalized size = 1.04

$$-\frac{2\,be^{(2\,x)} + a}{4\,(be^{(2\,x)} + a)^2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))^3,x, algorithm="giac")
```

```
[Out] -1/4*(2*b*e^(2*x) + a)/((b*e^(2*x) + a)^2*b^2)
```

Mupad [B]
time = 3.56, size = 31, normalized size = 1.35

$$\frac{\mathrm{e}^{4\,x}}{4\,a\,\left(a^2 + 2\,\mathrm{e}^{2\,x}\,a\,b + \mathrm{e}^{4\,x}\,b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x)/(a + b*exp(2*x))^3,x)
```

```
[Out] exp(4*x)/(4*a*(b^2*exp(4*x) + a^2 + 2*a*b*exp(2*x)))
```

3.25 $\int \frac{e^{4x}}{\left(a+be^{2x}\right)^4}\,dx$

Optimal. Leaf size=38

$$\frac{a}{6b^2\left(a+be^{2x}\right)^3}-\frac{1}{4b^2\left(a+be^{2x}\right)^2}$$

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

Rubi [A]

time = 0.03, antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$, Rules used = {2280, 45}

$$\frac{a}{6b^2\left(a+be^{2x}\right)^3}-\frac{1}{4b^2\left(a+be^{2x}\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(4*x)/(a + b*E^(2*x))^4,x]
```

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

Rule 45

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

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

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

Mathematica [A]
time = 0.03, size = 30, normalized size = 0.79

$$\frac{-a-3be^{2x}}{12b^2\left(a+be^{2x}\right)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(4*x)/(a + b*E^(2*x))^4,x]
```

```
[Out] (-a - 3*b*E^(2*x))/(12*b^2*(a + b*E^(2*x))^3)
```

Maple [A]
time = 0.02, size = 33, normalized size = 0.87

method	result	size
risch	$-\frac{3b\,\mathrm{e}^{2x}+a}{12b^2\left(a+b\,\mathrm{e}^{2x}\right)^3}$	25
norman	$\frac{-\frac{a}{12b^2}-\frac{\mathrm{e}^{2x}}{4b}}{\left(a+b\,\mathrm{e}^{2x}\right)^3}$	28
default	$\frac{a}{6b^2\left(a+b\,\mathrm{e}^{2x}\right)^3}-\frac{1}{4b^2\left(a+b\,\mathrm{e}^{2x}\right)^2}$	33

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x)/(a+b*exp(2*x))^4,x,method=_RETURNVERBOSE)
```

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

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 91 vs. $2(32) = 64$.
time = 0.29, size = 91, normalized size = 2.39

$$-\frac{be^{(2x)}}{4\left(b^5e^{(6x)}+3\,ab^4e^{(4x)}+3\,a^2b^3e^{(2x)}+a^3b^2\right)}-\frac{a}{12\left(b^5e^{(6x)}+3\,ab^4e^{(4x)}+3\,a^2b^3e^{(2x)}+a^3b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))^4,x, algorithm="maxima")
```

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

Fricas [A]
time = 0.40, size = 51, normalized size = 1.34

$$-\frac{3\,be^{(2x)}+a}{12\left(b^5e^{(6x)}+3\,ab^4e^{(4x)}+3\,a^2b^3e^{(2x)}+a^3b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))^4,x, algorithm="fricas")
```

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

Sympy [A]
time = 0.09, size = 54, normalized size = 1.42

$$\frac{-a-3be^{2x}}{12a^3b^2+36a^2b^3e^{2x}+36ab^4e^{4x}+12b^5e^{6x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))**4,x)
```

```
[Out] (-a - 3*b*exp(2*x))/(12*a**3*b**2 + 36*a**2*b**3*exp(2*x) + 36*a*b**4*exp(4
*x) + 12*b**5*exp(6*x))
```

Giac [A]
time = 3.29, size = 24, normalized size = 0.63

$$-\frac{3\,be^{(2\,x)}+a}{12\,\left(be^{(2\,x)}+a\right)^3b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))^4,x, algorithm="giac")
```

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

Mupad [B]
time = 3.60, size = 55, normalized size = 1.45

$$\frac{\frac{\mathrm{e}^{4\,x}}{4\,a}+\frac{b\,\mathrm{e}^{6\,x}}{12\,a^2}}{a^3+3\,\mathrm{e}^{2\,x}\,a^2\,b+3\,\mathrm{e}^{4\,x}\,a\,b^2+\mathrm{e}^{6\,x}\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x)/(a + b*exp(2*x))^4,x)
```

```
[Out] (exp(4*x)/(4*a) + (b*exp(6*x))/(12*a^2))/(b^3*exp(6*x) + a^3 + 3*a^2*b*exp(
2*x) + 3*a*b^2*exp(4*x))
```

3.26 $\int \frac{e^{4x}}{(a+be^{2x})^{2/3}}\,dx$

Optimal. Leaf size=42

$$-\frac{3a\sqrt[3]{a+be^{2x}}}{2b^2}+\frac{3(a+be^{2x})^{4/3}}{8b^2}$$

```
[Out] -3/2*a*(a+b*exp(2*x))^(1/3)/b^2+3/8*(a+b*exp(2*x))^(4/3)/b^2
```

Rubi [A]
time = 0.03, antiderivative size = 42, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.105$, Rules used = {2280, 45}

$$\frac{3(a+be^{2x})^{4/3}}{8b^2}-\frac{3a\sqrt[3]{a+be^{2x}}}{2b^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(4*x)/(a + b*E^(2*x))^(2/3),x]
```

```
[Out] (-3*a*(a + b*E^(2*x))^(1/3))/(2*b^2) + (3*(a + b*E^(2*x))^(4/3))/(8*b^2)
```

Rule 45

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

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^{4x}}{(a+be^{2x})^{2/3}}\,dx = \frac{1}{2}\text{Subst}\left(\int \frac{x}{(a+bx)^{2/3}}\,dx, x, e^{2x}\right)$$
$$= \frac{1}{2}\text{Subst}\left(\int \left(-\frac{a}{b(a+bx)^{2/3}} + \frac{\sqrt[3]{a+bx}}{b}\right)\,dx, x, e^{2x}\right)$$
$$= -\frac{3a\sqrt[3]{a+be^{2x}}}{2b^2} + \frac{3(a+be^{2x})^{4/3}}{8b^2}$$

Mathematica [A]
time = 0.03, size = 31, normalized size = 0.74

$$\frac{3(-3a+be^{2x})\sqrt[3]{a+be^{2x}}}{8b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(4*x)/(a + b*E^(2*x))^(2/3),x]
[Out] (3*(-3*a + b*E^(2*x))*(a + b*E^(2*x))^(1/3))/(8*b^2)
```

Maple [A]
time = 0.01, size = 27, normalized size = 0.64

method	result	size
risch	$-\frac{3\left(a+b\,{\mathrm e}^{2 x}\right)^{\frac{1}{3}} \left(-b\,{\mathrm e}^{2 x}+3 a\right)}{8 b^{2}}$	27
meijerg	error in int/gbinthm/express: unable to compute coeff\	N/A

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x)/(a+b*exp(2*x))^(2/3),x,method=_RETURNVERBOSE)
[Out] -3/8*(a+b*exp(2*x))^(1/3)*(-b*exp(2*x)+3*a)/b^2
```

Maxima [A]
time = 0.29, size = 32, normalized size = 0.76

$$\frac{3\left(be^{(2x)}+a\right)^{\frac{4}{3}}}{8\,b^2} - \frac{3\left(be^{(2x)}+a\right)^{\frac{1}{3}}a}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))^(2/3),x, algorithm="maxima")
[Out] 3/8*(b*e^(2*x) + a)^(4/3)/b^2 - 3/2*(b*e^(2*x) + a)^(1/3)*a/b^2
```

Fricas [A]
time = 0.35, size = 25, normalized size = 0.60

$$\frac{3\left(be^{(2x)}+a\right)^{\frac{1}{3}}\left(be^{(2x)}-3a\right)}{8b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))^(2/3),x, algorithm="fricas")
```

```
[Out] 3/8*(b*e^(2*x) + a)^(1/3)*(b*e^(2*x) - 3*a)/b^2
```

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

$$\int\frac{e^{4x}}{\left(a+be^{2x}\right)^{\frac{2}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))**(2/3),x)
```

```
[Out] Integral(exp(4*x)/(a + b*exp(2*x))**(2/3), x)
```

Giac [A]
time = 1.98, size = 32, normalized size = 0.76

$$\frac{3\left(be^{(2x)}+a\right)^{\frac{4}{3}}}{8b^2}-\frac{3\left(be^{(2x)}+a\right)^{\frac{1}{3}}a}{2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))^(2/3),x, algorithm="giac")
```

```
[Out] 3/8*(b*e^(2*x) + a)^(4/3)/b^2 - 3/2*(b*e^(2*x) + a)^(1/3)*a/b^2
```

Mupad [B]
time = 3.49, size = 26, normalized size = 0.62

$$-\frac{3\left(3a-b\,\mathrm{e}^{2x}\right)\left(a+b\,\mathrm{e}^{2x}\right)^{1/3}}{8b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x)/(a + b*exp(2*x))^(2/3),x)
```

```
[Out] -(3*(3*a - b*exp(2*x))*(a + b*exp(2*x))^(1/3))/(8*b^2)
```

3.27 $\int e^{-nx}(a+be^{nx})\,dx$

Optimal. Leaf size=16

$$-\frac{ae^{-nx}}{n}+bx$$

[Out] -a/exp(n*x)/n+b*x

Rubi [A]

time = 0.01, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {2280, 45}

$$bx-\frac{ae^{-nx}}{n}$$

Antiderivative was successfully verified.

[In] Int[(a + b*E^(n*x))/E^(n*x),x]

[Out] -(a/(E^(n*x)*n)) + b*x

Rule 45

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

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int e^{-nx}(a+be^{nx})\,dx &= \frac{\text{Subst}\left(\int \frac{a+bx}{x^2}\,dx,x,e^{nx}\right)}{n}\\ &= \frac{\text{Subst}\left(\int \left(\frac{a}{x^2}+\frac{b}{x}\right)\,dx,x,e^{nx}\right)}{n}\\ &= -\frac{ae^{-nx}}{n}+bx\end{aligned}$$

Mathematica [A]
time = 0.01, size = 16, normalized size = 1.00

$$-\frac{ae^{-nx}}{n}+bx$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*E^(n*x))/E^(n*x),x]
[Out] -(a/(E^(n*x)*n)) + b*x
```

Maple [A]
time = 0.01, size = 22, normalized size = 1.38

method	result	size
risch	$-\frac{a\,\mathrm{e}^{-nx}}{n}+bx$	16
derivativedivides	$\frac{-a\,\mathrm{e}^{-nx}+b\ln\left(\mathrm{e}^{nx}\right)}{n}$	22
default	$\frac{-a\,\mathrm{e}^{-nx}+b\ln\left(\mathrm{e}^{nx}\right)}{n}$	22
norman	$\left(bx\,\mathrm{e}^{nx}-\frac{a}{n}\right)\mathrm{e}^{-nx}$	22

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*exp(n*x))/exp(n*x),x,method=_RETURNVERBOSE)
[Out] 1/n*(-a/exp(n*x)+b*ln(exp(n*x)))
```

Maxima [A]
time = 0.30, size = 15, normalized size = 0.94

$$bx-\frac{ae^{(-nx)}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(n*x))/exp(n*x),x, algorithm="maxima")
[Out] b*x - a*e^(-n*x)/n
```

Fricas [A]
time = 0.34, size = 21, normalized size = 1.31

$$\frac{\left(bnxe^{(nx)}-a\right)e^{(-nx)}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(n*x))/exp(n*x),x, algorithm="fricas")
```

```
[Out] (b*n*x*e^(n*x) - a)*e^(-n*x)/n
```

Sympy [A]
time = 0.05, size = 15, normalized size = 0.94

$$bx + \begin{cases} -\frac{ae^{-nx}}{n} & \text{for } n \neq 0 \\ ax & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(n*x))/exp(n*x),x)
```

```
[Out] b*x + Piecewise((-a*exp(-n*x)/n, Ne(n, 0)), (a*x, True))
```

Giac [A]
time = 2.32, size = 15, normalized size = 0.94

$$bx - \frac{ae^{(-nx)}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(n*x))/exp(n*x),x, algorithm="giac")
```

```
[Out] b*x - a*e^(-n*x)/n
```

Mupad [B]
time = 0.08, size = 15, normalized size = 0.94

$$b\,x - \frac{a\,\mathrm{e}^{-n\,x}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-n*x)*(a + b*exp(n*x)),x)
```

```
[Out] b*x - (a*exp(-n*x))/n
```

3.28 $\int e^{-nx}(a+be^{nx})^2\,dx$

Optimal. Leaf size=32

$$-\frac{a^2e^{-nx}}{n}+\frac{b^2e^{nx}}{n}+2abx$$

[Out] -a^2/exp(n*x)/n+b^2*exp(n*x)/n+2*a*b*x

Rubi [A]
time = 0.03, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2280, 45}

$$-\frac{a^2e^{-nx}}{n}+2abx+\frac{b^2e^{nx}}{n}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*E^(n*x))^2/E^(n*x),x]
```

```
[Out] -(a^2/(E^(n*x)*n)) + (b^2*E^(n*x))/n + 2*a*b*x
```

Rule 45

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

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int e^{-nx}(a+be^{nx})^2\,dx&=\frac{\text{Subst}\left(\int\frac{(a+bx)^2}{x^2}\,dx,x,e^{nx}\right)}{n}\\&=\frac{\text{Subst}\left(\int\left(b^2+\frac{a^2}{x^2}+\frac{2ab}{x}\right)dx,x,e^{nx}\right)}{n}\\&=-\frac{a^2e^{-nx}}{n}+\frac{b^2e^{nx}}{n}+2abx\end{aligned}$$

Mathematica [A]
time = 0.03, size = 36, normalized size = 1.12

$$\frac{-a^2 e^{-nx} + b^2 e^{nx} - 2ab \log \left(e^{-nx}\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*E^(n*x))^2/E^(n*x),x]
```

```
[Out] (-(a^2/E^(n*x)) + b^2*E^(n*x) - 2*a*b*Log[E^(-(n*x))])/n
```

Maple [A]
time = 0.01, size = 34, normalized size = 1.06

method	result	size
risch	$-\frac{a^2 \mathrm{e}^{-nx}}{n} + \frac{b^2 \mathrm{e}^{nx}}{n} + 2abx$	31
derivativedivides	$\frac{b^2 \mathrm{e}^{nx} - a^2 \mathrm{e}^{-nx} + 2ba \ln(\mathrm{e}^{nx})}{n}$	34
default	$\frac{b^2 \mathrm{e}^{nx} - a^2 \mathrm{e}^{-nx} + 2ba \ln(\mathrm{e}^{nx})}{n}$	34
norman	$\left(\frac{b^2 \mathrm{e}^{2nx}}{n} - \frac{a^2}{n} + 2abx\, \mathrm{e}^{nx}\right) \mathrm{e}^{-nx}$	39

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*exp(n*x))^2/exp(n*x),x,method=_RETURNVERBOSE)
```

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

Maxima [A]
time = 0.28, size = 30, normalized size = 0.94

$$2\,abx + \frac{b^2 e^{(nx)}}{n} - \frac{a^2 e^{(-nx)}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(n*x))^2/exp(n*x),x, algorithm="maxima")
```

```
[Out] 2*a*b*x + b^2*e^(n*x)/n - a^2*e^(-n*x)/n
```

Fricas [A]
time = 0.39, size = 34, normalized size = 1.06

$$\frac{\left(2\,abnxe^{(nx)} + b^2 e^{(2\,nx)} - a^2\right)e^{(-nx)}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(n*x))^2/exp(n*x),x, algorithm="fricas")
```

[Out] (2*a*b*n*x*e^(n*x) + b^2*e^(2*n*x) - a^2)*e^(-n*x)/n

Sympy [A]
time = 0.06, size = 39, normalized size = 1.22

$$2abx + \begin{cases} \frac{-a^2ne^{-nx}+b^2ne^{nx}}{n^2} & \text{for } n^2 \neq 0 \\ x(a^2+b^2) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(n*x))**2/exp(n*x),x)
```

```
[Out] 2*a*b*x + Piecewise(((-a**2*n*exp(-n*x) + b**2*n*exp(n*x))/n**2, Ne(n**2, 0
)), (x*(a**2 + b**2), True))
```

Giac [A]
time = 2.67, size = 30, normalized size = 0.94

$$2\,abx + \frac{b^2e^{(nx)}}{n} - \frac{a^2e^{(-nx)}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(n*x))^2/exp(n*x),x, algorithm="giac")
```

```
[Out] 2*a*b*x + b^2*e^(n*x)/n - a^2*e^(-n*x)/n
```

Mupad [B]
time = 0.09, size = 30, normalized size = 0.94

$$2\,a\,b\,x - \frac{e^{-n\,x}\,(a^2 - b^2\,e^{2\,n\,x})}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-n*x)*(a + b*exp(n*x))^2,x)
```

```
[Out] 2*a*b*x - (exp(-n*x)*(a^2 - b^2*exp(2*n*x)))/n
```

3.29 $\int e^{-nx}(a+be^{nx})^3\,dx$

Optimal. Leaf size=52

$$-\frac{a^3e^{-nx}}{n}+\frac{3ab^2e^{nx}}{n}+\frac{b^3e^{2nx}}{2n}+3a^2bx$$

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

Rubi [A]
time = 0.03, antiderivative size = 52, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2280, 45}

$$-\frac{a^3e^{-nx}}{n}+3a^2bx+\frac{3ab^2e^{nx}}{n}+\frac{b^3e^{2nx}}{2n}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*E^(n*x))^3/E^(n*x),x]
```

```
[Out] -(a^3/(E^(n*x)*n)) + (3*a*b^2*E^(n*x))/n + (b^3*E^(2*n*x))/(2*n) + 3*a^2*b*
x
```

Rule 45

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

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int e^{-nx}(a+be^{nx})^3\,dx = \frac{\text{Subst}\left(\int \frac{(a+bx)^3}{x^2}\,dx, x, e^{nx}\right)}{n}$$
$$= \frac{\text{Subst}\left(\int \left(3ab^2+\frac{a^3}{x^2}+\frac{3a^2b}{x}+b^3x\right)\,dx, x, e^{nx}\right)}{n}$$
$$= -\frac{a^3e^{-nx}}{n}+\frac{3ab^2e^{nx}}{n}+\frac{b^3e^{2nx}}{2n}+3a^2bx$$

Mathematica [A]
time = 0.04, size = 53, normalized size = 1.02

$$\frac{-2a^3e^{-nx}+6ab^2e^{nx}+b^3e^{2nx}-6a^2b\log\left(e^{-nx}\right)}{2n}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*E^(n*x))^3/E^(n*x),x]
[Out] ((-2*a^3)/E^(n*x) + 6*a*b^2*E^(n*x) + b^3*E^(2*n*x) - 6*a^2*b*Log[E^(-(n*x)
)])/(2*n)
```

Maple [A]
time = 0.01, size = 49, normalized size = 0.94

method	result	size
risch	$3a^2bx+\frac{b^3e^{2nx}}{2n}+\frac{3a\,b^2e^{nx}}{n}-\frac{a^3e^{-nx}}{n}$	48
derivativedivides	$\frac{\frac{b^3e^{2nx}}{2}+3a\,b^2e^{nx}-a^3e^{-nx}+3a^2b\ln(e^{nx})}{n}$	49
default	$\frac{\frac{b^3e^{2nx}}{2}+3a\,b^2e^{nx}-a^3e^{-nx}+3a^2b\ln(e^{nx})}{n}$	49
norman	$\left(-\frac{a^3}{n}+\frac{b^3e^{3nx}}{2n}+\frac{3a\,b^2e^{2nx}}{n}+3a^2bx\,e^{nx}\right)e^{-nx}$	57

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*exp(n*x))^3/exp(n*x),x,method=_RETURNVERBOSE)
[Out] 1/n*(1/2*b^3*exp(n*x)^2+3*a*b^2*exp(n*x)-a^3/exp(n*x)+3*a^2*b*ln(exp(n*x)))
```

Maxima [A]
time = 0.29, size = 47, normalized size = 0.90

$$3\,a^2bx+\frac{b^3e^{(2\,nx)}}{2\,n}+\frac{3\,ab^2e^{(nx)}}{n}-\frac{a^3e^{(-nx)}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(n*x))^3/exp(n*x),x, algorithm="maxima")
```

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

Fricas [A]
time = 0.38, size = 48, normalized size = 0.92

$$\frac{\left(6\,a^2bnxe^{(nx)}+b^3e^{(3\,nx)}+6\,ab^2e^{(2\,nx)}-2\,a^3\right)e^{(-nx)}}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(n*x))^3/exp(n*x),x, algorithm="fricas")
```

```
[Out] 1/2*(6*a^2*b*n*x*e^(n*x) + b^3*e^(3*n*x) + 6*a*b^2*e^(2*n*x) - 2*a^3)*e^(-n
*x)/n
```

Sympy [A]
time = 0.08, size = 71, normalized size = 1.37

$$3a^2bx+\begin{cases}\frac{-2a^3n^2e^{-nx}+6ab^2n^2e^{nx}+b^3n^2e^{2nx}}{2n^3} & \text{for } n^3\neq 0\\ x\left(a^3+3ab^2+b^3\right) & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(n*x))**3/exp(n*x),x)
```

```
[Out] 3*a**2*b*x + Piecewise(((-2*a**3*n**2*exp(-n*x) + 6*a*b**2*n**2*exp(n*x) +
b**3*n**2*exp(2*n*x))/(2*n**3), Ne(n**3, 0)), (x*(a**3 + 3*a*b**2 + b**3),
True))
```

Giac [A]
time = 2.62, size = 47, normalized size = 0.90

$$3\,a^2bx+\frac{b^3e^{(2\,nx)}}{2\,n}+\frac{3\,ab^2e^{(nx)}}{n}-\frac{a^3e^{(-nx)}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(n*x))^3/exp(n*x),x, algorithm="giac")
```

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

Mupad [B]
time = 3.52, size = 44, normalized size = 0.85

$$\frac{\mathrm{e}^{-n\,x}\,\left(-2\,a^3+6\,\mathrm{e}^{2\,n\,x}\,a\,b^2+\mathrm{e}^{3\,n\,x}\,b^3\right)}{2\,n}+3\,a^2\,b\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-n*x)*(a + b*exp(n*x))^3,x)
```

```
[Out] (exp(-n*x)*(b^3*exp(3*n*x) - 2*a^3 + 6*a*b^2*exp(2*n*x)))/(2*n) + 3*a^2*b*x
```

3.30 $\int \frac{e^{-nx}}{a+be^{nx}}\,dx$

Optimal. Leaf size=40

$$-\frac{e^{-nx}}{an}-\frac{bx}{a^2}+\frac{b\log\left(a+be^{nx}\right)}{a^2n}$$

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

Rubi [A]
time = 0.03, antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2280, 46}

$$\frac{b\log\left(a+be^{nx}\right)}{a^2n}-\frac{bx}{a^2}-\frac{e^{-nx}}{an}$$

Antiderivative was successfully verified.

```
[In] Int[1/(E^(n*x)*(a + b*E^(n*x))),x]
[Out] -(1/(a*E^(n*x)*n)) - (b*x)/a^2 + (b*Log[a + b*E^(n*x)])/(a^2*n)
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{e^{-nx}}{a+be^{nx}}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{x^2(a+bx)}\,dx,x,e^{nx}\right)}{n}\\
&= \frac{\text{Subst}\left(\int \left(\frac{1}{ax^2}-\frac{b}{a^2x}+\frac{b^2}{a^2(a+bx)}\right)\,dx,x,e^{nx}\right)}{n}\\
&= -\frac{e^{-nx}}{an}-\frac{bx}{a^2}+\frac{b\log\left(a+be^{nx}\right)}{a^2n}
\end{aligned}$$

Mathematica [A]
time = 0.03, size = 40, normalized size = 1.00

$$-\frac{e^{-nx}}{an}+\frac{b\log\left(abn+a^2e^{-nx}n\right)}{a^2n}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(E^(n*x)*(a + b*E^(n*x))),x]
```

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

Maple [A]
time = 0.01, size = 42, normalized size = 1.05

method	result	size
risch	$-\frac{\mathrm{e}^{-nx}}{an}-\frac{bx}{a^2}+\frac{b\ln\left(\mathrm{e}^{nx}+\frac{a}{b}\right)}{a^2n}$	41
derivativedivides	$\frac{-\frac{\mathrm{e}^{-nx}}{a}-\frac{b\ln\left(\mathrm{e}^{nx}\right)}{a^2}+\frac{b\ln\left(a+b\,\mathrm{e}^{nx}\right)}{a^2}}{n}$	42
default	$\frac{-\frac{\mathrm{e}^{-nx}}{a}-\frac{b\ln\left(\mathrm{e}^{nx}\right)}{a^2}+\frac{b\ln\left(a+b\,\mathrm{e}^{nx}\right)}{a^2}}{n}$	42
norman	$\left(-\frac{1}{an}-\frac{bx\,\mathrm{e}^{nx}}{a^2}\right)\mathrm{e}^{-nx}+\frac{b\ln\left(a+b\,\mathrm{e}^{nx}\right)}{a^2n}$	46

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/exp(n*x)/(a+b*exp(n*x)),x,method=_RETURNVERBOSE)
```

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

Maxima [A]
time = 0.28, size = 32, normalized size = 0.80

$$-\frac{e^{(-nx)}}{an}+\frac{b\log\left(ae^{(-nx)}+b\right)}{a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(n*x)/(a+b*exp(n*x)),x, algorithm="maxima")
```

```
[Out] -e^(-n*x)/(a*n) + b*log(a*e^(-n*x) + b)/(a^2*n)
```

Fricas [A]
time = 0.39, size = 39, normalized size = 0.98

$$-\frac{\left(bnxe^{(nx)}-be^{(nx)}\log\left(be^{(nx)}+a\right)+a\right)e^{(-nx)}}{a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(n*x)/(a+b*exp(n*x)),x, algorithm="fricas")
[Out] -(b*n*x*e^(n*x) - b*e^(n*x)*log(b*e^(n*x) + a) + a)*e^(-n*x)/(a^2*n)
```

Sympy [A]
time = 0.07, size = 49, normalized size = 1.22

$$\begin{cases} -\frac{e^{-nx}}{an} & \text{for}\ an \neq 0 \\ x\left(\frac{b}{a^2} + \frac{a-b}{a^2}\right) & \text{otherwise} \end{cases} - \frac{bx}{a^2} + \frac{b\log\left(\frac{a}{b} + e^{nx}\right)}{a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(n*x)/(a+b*exp(n*x)),x)
[Out] Piecewise((-exp(-n*x)/(a*n), Ne(a*n, 0)), (x*(b/a**2 + (a - b)/a**2), True)
) - b*x/a**2 + b*log(a/b + exp(n*x))/(a**2*n)
```

Giac [A]
time = 2.84, size = 38, normalized size = 0.95

$$-\frac{\frac{bnx}{a^2} + \frac{e^{(-nx)}}{a} - \frac{b\log\left(\left|be^{(nx)}+a\right|\right)}{a^2}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(n*x)/(a+b*exp(n*x)),x, algorithm="giac")
[Out] -(b*n*x/a^2 + e^(-n*x)/a - b*log(abs(b*e^(n*x) + a))/a^2)/n
```

Mupad [B]
time = 3.57, size = 38, normalized size = 0.95

$$\frac{b\,\ln\left(a+b\,\mathrm{e}^{n\,x}\right)}{a^2\,n}-\frac{b\,x}{a^2}-\frac{\mathrm{e}^{-n\,x}}{a\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-n*x)/(a + b*exp(n*x)),x)
[Out] (b*log(a + b*exp(n*x)))/(a^2*n) - (b*x)/a^2 - exp(-n*x)/(a*n)
```

3.31 $\int \frac{e^{-nx}}{(a+be^{nx})^2}\,dx$

Optimal. Leaf size=61

$$-\frac{e^{-nx}}{a^2n}-\frac{b}{a^2\left(a+be^{nx}\right)n}-\frac{2bx}{a^3}+\frac{2b\log\left(a+be^{nx}\right)}{a^3n}$$

```
[Out] -1/a^2/exp(n*x)/n-b/a^2/(a+b*exp(n*x))/n-2*b*x/a^3+2*b*ln(a+b*exp(n*x))/a^3
/n
```

Rubi [A]
time = 0.04, antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2280, 46}

$$\frac{2b\log\left(a+be^{nx}\right)}{a^3n}-\frac{2bx}{a^3}-\frac{b}{a^2n\left(a+be^{nx}\right)}-\frac{e^{-nx}}{a^2n}$$

Antiderivative was successfully verified.

```
[In] Int[1/(E^(n*x)*(a + b*E^(n*x))^2),x]
```

```
[Out] -(1/(a^2*E^(n*x)*n)) - b/(a^2*(a + b*E^(n*x))*n) - (2*b*x)/a^3 + (2*b*Log[a
 + b*E^(n*x)])/(a^3*n)
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^{-nx}}{(a+be^{nx})^2}\,dx = \frac{\text{Subst}\left(\int \frac{1}{x^2(a+bx)^2}\,dx, x, e^{nx}\right)}{n}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{1}{a^2x^2} - \frac{2b}{a^3x} + \frac{b^2}{a^2(a+bx)^2} + \frac{2b^2}{a^3(a+bx)}\right)\,dx, x, e^{nx}\right)}{n}$$
$$= -\frac{e^{-nx}}{a^2n} - \frac{b}{a^2(a+be^{nx})\,n} - \frac{2bx}{a^3} + \frac{2b\log(a+be^{nx})}{a^3n}$$

Mathematica [A]
time = 0.07, size = 59, normalized size = 0.97

$$\frac{-\frac{ab+a^2e^{-nx}-b^2e^{nx}}{a+be^{nx}} + 2b\log\left(b+ae^{-nx}\right)}{a^3n}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(E^(n*x)*(a + b*E^(n*x))^2),x]
```

```
[Out] (-((a*b + a^2/E^(n*x) - b^2*E^(n*x))/(a + b*E^(n*x))) + 2*b*Log[b + a/E^(n*
x)])/(a^3*n)
```

Maple [A]
time = 0.03, size = 59, normalized size = 0.97

method	result	size
derivativedivides	$\frac{-\frac{e^{-nx}}{a^2}-\frac{2b\ln(e^{nx})}{a^3}-\frac{b}{a^2(a+b\,e^{nx})}+\frac{2b\ln(a+b\,e^{nx})}{a^3}}{n}$	59
default	$\frac{-\frac{e^{-nx}}{a^2}-\frac{2b\ln(e^{nx})}{a^3}-\frac{b}{a^2(a+b\,e^{nx})}+\frac{2b\ln(a+b\,e^{nx})}{a^3}}{n}$	59
risch	$-\frac{e^{-nx}}{a^2n}-\frac{2bx}{a^3}-\frac{b}{a^2(a+b\,e^{nx})n}+\frac{2b\ln\left(e^{nx}+\frac{a}{b}\right)}{a^3n}$	61
norman	$\frac{\left(-\frac{2b\,e^{nx}}{a^2n}-\frac{1}{an}-\frac{2bx\,e^{nx}}{a^2}-\frac{2b^2x\,e^{2nx}}{a^3}\right)e^{-nx}}{a+b\,e^{nx}}+\frac{2b\ln(a+b\,e^{nx})}{a^3n}$	85

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/exp(n*x)/(a+b*exp(n*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/n*(-1/a^2/exp(n*x)-2/a^3*b*ln(exp(n*x))-1/a^2*b/(a+b*exp(n*x))+2/a^3*b*ln
(a+b*exp(n*x)))
```

Maxima [A]
time = 0.32, size = 57, normalized size = 0.93

$$\frac{b^2}{(a^4e^{(-nx)}+a^3b)n} - \frac{e^{(-nx)}}{a^2n} + \frac{2\,b\log\left(ae^{(-nx)}+b\right)}{a^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(n*x)/(a+b*exp(n*x))^2,x, algorithm="maxima")
```

```
[Out] b^2/((a^4*e^(-n*x) + a^3*b)*n) - e^(-n*x)/(a^2*n) + 2*b*log(a*e^(-n*x) + b)
/(a^3*n)
```

Fricas [A]
time = 0.45, size = 84, normalized size = 1.38

$$-\frac{2\,b^2nxe^{(2\,nx)}+a^2+2\,(abnx+ab)e^{(nx)}-2\,\left(b^2e^{(2\,nx)}+abe^{(nx)}\right)\log\left(be^{(nx)}+a\right)}{a^3bne^{(2\,nx)}+a^4ne^{(nx)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(n*x)/(a+b*exp(n*x))^2,x, algorithm="fricas")
```

```
[Out] -(2*b^2*n*x*e^(2*n*x) + a^2 + 2*(a*b*n*x + a*b)*e^(n*x) - 2*(b^2*e^(2*n*x)
+ a*b*e^(n*x))*log(b*e^(n*x) + a))/(a^3*b*n*e^(2*n*x) + a^4*n*e^(n*x))
```

Sympy [A]
time = 0.08, size = 78, normalized size = 1.28

$$-\frac{b}{a^3n+a^2bne^{nx}}+\begin{cases}-\frac{e^{-nx}}{a^2n} & \text{for}\ a^2n\neq 0\\ x\left(\frac{2b}{a^3}+\frac{a-2b}{a^3}\right) & \text{otherwise}\end{cases}-\frac{2bx}{a^3}+\frac{2b\log\left(\frac{a}{b}+e^{nx}\right)}{a^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(n*x)/(a+b*exp(n*x))**2,x)
```

```
[Out] -b/(a**3*n + a**2*b*n*exp(n*x)) + Piecewise((-exp(-n*x)/(a**2*n), Ne(a**2*n
, 0)), (x*(2*b/a**3 + (a - 2*b)/a**3), True)) - 2*b*x/a**3 + 2*b*log(a/b +
exp(n*x))/(a**3*n)
```

Giac [A]
time = 1.83, size = 59, normalized size = 0.97

$$-\frac{\frac{2\,bnx}{a^3}-\frac{2\,b\log\left(\left|be^{(nx)}+a\right|\right)}{a^3}+\frac{2\,be^{(nx)}+a}{\left(be^{(2\,nx)}+ae^{(nx)}\right)a^2}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(n*x)/(a+b*exp(n*x))^2,x, algorithm="giac")
```

```
[Out] -(2*b*n*x/a^3 - 2*b*log(abs(b*e^(n*x) + a))/a^3 + (2*b*e^(n*x) + a)/((b*e^(
2*n*x) + a*e^(n*x))*a^2))/n
```

Mupad [B]
time = 3.67, size = 86, normalized size = 1.41

$$\frac{2\,b\,\ln\left(a+b\,{\mathrm{e}}^{n\,x}\right)}{a^3\,n}-\frac{\frac{1}{a\,n}+\frac{2\,b^2\,x\,{\mathrm{e}}^{2\,n\,x}}{a^3}-\frac{2\,b^2\,{\mathrm{e}}^{2\,n\,x}}{a^3\,n}+\frac{2\,b\,x\,{\mathrm{e}}^{n\,x}}{a^2}}{a\,{\mathrm{e}}^{n\,x}+b\,{\mathrm{e}}^{2\,n\,x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-n*x)/(a + b*exp(n*x))^2,x)
```

```
[Out] (2*b*log(a + b*exp(n*x)))/(a^3*n) - (1/(a*n) + (2*b^2*x*exp(2*n*x))/a^3 - (
2*b^2*exp(2*n*x))/(a^3*n) + (2*b*x*exp(n*x))/a^2)/(a*exp(n*x) + b*exp(2*n*x
))
```

3.32 $\int \frac{e^{-nx}}{(a+be^{nx})^3} \, dx$

Optimal. Leaf size=83

$$-\frac{e^{-nx}}{a^3 n}-\frac{b}{2a^2 \left(a+be^{nx}\right)^2 n}-\frac{2b}{a^3 \left(a+be^{nx}\right) n}-\frac{3bx}{a^4}+\frac{3b \log \left(a+be^{nx}\right)}{a^4 n}$$

```
[Out] -1/a^3/exp(n*x)/n-1/2*b/a^2/(a+b*exp(n*x))^2/n-2*b/a^3/(a+b*exp(n*x))/n-3*b
*x/a^4+3*b*ln(a+b*exp(n*x))/a^4/n
```

Rubi [A]
time = 0.05, antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2280, 46}

$$\frac{3b \log \left(a+be^{nx}\right)}{a^4 n}-\frac{3bx}{a^4}-\frac{2b}{a^3 n \left(a+be^{nx}\right)}-\frac{e^{-nx}}{a^3 n}-\frac{b}{2a^2 n \left(a+be^{nx}\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[1/(E^(n*x)*(a + b*E^(n*x))^3),x]
```

```
[Out] -(1/(a^3*E^(n*x)*n)) - b/(2*a^2*(a + b*E^(n*x))^2*n) - (2*b)/(a^3*(a + b*E^
(n*x))*n) - (3*b*x)/a^4 + (3*b*Log[a + b*E^(n*x)])/(a^4*n)
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^{-nx}}{(a+be^{nx})^3} dx = \frac{\text{Subst}\left(\int \frac{1}{x^2(a+bx)^3} dx, x, e^{nx}\right)}{n}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{1}{a^3x^2} - \frac{3b}{a^4x} + \frac{b^2}{a^2(a+bx)^3} + \frac{2b^2}{a^3(a+bx)^2} + \frac{3b^2}{a^4(a+bx)}\right) dx, x, e^{nx}\right)}{n}$$
$$= -\frac{e^{-nx}}{a^3n} - \frac{b}{2a^2(a+be^{nx})^2 n} - \frac{2b}{a^3(a+be^{nx}) n} - \frac{3bx}{a^4} + \frac{3b\log(a+be^{nx})}{a^4n}$$

Mathematica [A]
time = 0.07, size = 79, normalized size = 0.95

$$\frac{\frac{5b^3-2a^3e^{-3nx}-4a^2be^{-2nx}+4ab^2e^{-nx}}{(b+ae^{-nx})^2} + 6b\log(b+ae^{-nx})}{2a^4n}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(E^(n*x)*(a + b*E^(n*x))^3),x]
```

```
[Out] ((5*b^3 - (2*a^3)/E^(3*n*x) - (4*a^2*b)/E^(2*n*x) + (4*a*b^2)/E^(n*x))/(b +
 a/E^(n*x))^2 + 6*b*Log[b + a/E^(n*x)])/(2*a^4*n)
```

Maple [A]
time = 0.02, size = 75, normalized size = 0.90

method	result	size
risch	$-\frac{e^{-nx}}{a^3n} - \frac{3bx}{a^4} - \frac{b(4b e^{nx}+5a)}{2a^3n(a+b e^{nx})^2} + \frac{3b\ln\left(e^{nx}+\frac{a}{b}\right)}{a^4n}$	72
derivativedivides	$\frac{-\frac{e^{-nx}}{a^3} - \frac{3b\ln(e^{nx})}{a^4} - \frac{b}{2a^2(a+b e^{nx})^2} + \frac{3b\ln(a+b e^{nx})}{a^4} - \frac{2b}{a^3(a+b e^{nx})}}{n}$	75
default	$\frac{-\frac{e^{-nx}}{a^3} - \frac{3b\ln(e^{nx})}{a^4} - \frac{b}{2a^2(a+b e^{nx})^2} + \frac{3b\ln(a+b e^{nx})}{a^4} - \frac{2b}{a^3(a+b e^{nx})}}{n}$	75
norman	$\frac{\left(-\frac{1}{an} - \frac{3bx e^{nx}}{a^2} - \frac{6b^2x e^{2nx}}{a^3} - \frac{3b^3x e^{3nx}}{a^4} + \frac{6b^2 e^{2nx}}{a^3n} + \frac{9b^3 e^{3nx}}{2a^4n}\right)e^{-nx}}{(a+b e^{nx})^2} + \frac{3b\ln(a+b e^{nx})}{a^4n}$	121

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/exp(n*x)/(a+b*exp(n*x))^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/n*(-1/a^3/exp(n*x)-3/a^4*b*ln(exp(n*x))-1/2/a^2*b/(a+b*exp(n*x))^2+3/a^4*
b*ln(a+b*exp(n*x))-2/a^3*b/(a+b*exp(n*x)))
```

Maxima [A]
time = 0.29, size = 85, normalized size = 1.02

$$\frac{6\,ab^2e^{(-nx)} + 5\,b^3}{2\,(2\,a^5be^{(-nx)} + a^6e^{(-2\,nx)} + a^4b^2)n} - \frac{e^{(-nx)}}{a^3n} + \frac{3\,b\log\left(ae^{(-nx)} + b\right)}{a^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(n*x)/(a+b*exp(n*x))^3,x, algorithm="maxima")
```

```
[Out] 1/2*(6*a*b^2*e^(-n*x) + 5*b^3)/((2*a^5*b*e^(-n*x) + a^6*e^(-2*n*x) + a^4*b^
2)*n) - e^(-n*x)/(a^3*n) + 3*b*log(a*e^(-n*x) + b)/(a^4*n)
```

Fricas [A]
time = 0.39, size = 140, normalized size = 1.69

$$-\frac{6\,b^{3}nxe^{(3\,nx)}+2\,a^{3}+6\,(2\,ab^{2}nx+ab^{2})e^{(2\,nx)}+3\,(2\,a^{2}bnx+3\,a^{2}b)e^{(nx)}-6\,\left(b^{3}e^{(3\,nx)}+2\,ab^{2}e^{(2\,nx)}+a^{2}be^{(nx)}\right)\log\left(be^{(nx)}+a\right)}{2\,\left(a^{4}b^{2}ne^{(3\,nx)}+2\,a^{5}bne^{(2\,nx)}+a^{6}ne^{(nx)}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(n*x)/(a+b*exp(n*x))^3,x, algorithm="fricas")
```

```
[Out] -1/2*(6*b^3*n*x*e^(3*n*x) + 2*a^3 + 6*(2*a*b^2*n*x + a*b^2)*e^(2*n*x) + 3*(
2*a^2*b*n*x + 3*a^2*b)*e^(n*x) - 6*(b^3*e^(3*n*x) + 2*a*b^2*e^(2*n*x) + a^2
*b*e^(n*x))*log(b*e^(n*x) + a))/(a^4*b^2*n*e^(3*n*x) + 2*a^5*b*n*e^(2*n*x)
+ a^6*n*e^(n*x))
```

Sympy [A]
time = 0.11, size = 114, normalized size = 1.37

$$\frac{-5ab-4b^{2}e^{nx}}{2a^{5}n+4a^{4}bne^{nx}+2a^{3}b^{2}ne^{2nx}}+\begin{cases}-\frac{e^{-nx}}{a^{3}n} & \text{for}\ a^{3}n\neq 0\\ x\left(\frac{3b}{a^{4}}+\frac{a-3b}{a^{4}}\right) & \text{otherwise}\end{cases}-\frac{3bx}{a^{4}}+\frac{3b\log\left(\frac{a}{b}+e^{nx}\right)}{a^{4}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(n*x)/(a+b*exp(n*x))**3,x)
```

```
[Out] (-5*a*b - 4*b**2*exp(n*x))/(2*a**5*n + 4*a**4*b*n*exp(n*x) + 2*a**3*b**2*n*
exp(2*n*x)) + Piecewise((-exp(-n*x)/(a**3*n), Ne(a**3*n, 0)), (x*(3*b/a**4
+ (a - 3*b)/a**4), True)) - 3*b*x/a**4 + 3*b*log(a/b + exp(n*x))/(a**4*n)
```

Giac [A]
time = 1.68, size = 76, normalized size = 0.92

$$-\frac{\frac{6\,bnx}{a^{4}}-\frac{6\,b\log\left(\left|be^{(nx)}+a\right|\right)}{a^{4}}+\frac{\left(6\,ab^{2}e^{(2\,nx)}+9\,a^{2}be^{(nx)}+2\,a^{3}\right)e^{(-nx)}}{\left(be^{(nx)}+a\right)^{2}a^{4}}}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(n*x)/(a+b*exp(n*x))^3,x, algorithm="giac")
```

```
[Out] -1/2*(6*b*n*x/a^4 - 6*b*log(abs(b*e^(n*x) + a))/a^4 + (6*a*b^2*e^(2*n*x) +
9*a^2*b*e^(n*x) + 2*a^3)*e^(-n*x)/((b*e^(n*x) + a)^2*a^4))/n
```

Mupad [B]
time = 0.19, size = 104, normalized size = 1.25

$$\frac{\frac{6\,b^2\,\mathrm{e}^{2\,n\,x}}{a^3\,n}-\frac{1}{a\,n}+\frac{9\,b^3\,\mathrm{e}^{3\,n\,x}}{2\,a^4\,n}}{\mathrm{e}^{n\,x}\,a^2+2\,\mathrm{e}^{2\,n\,x}\,a\,b+\mathrm{e}^{3\,n\,x}\,b^2}-\frac{3\,b\,\ln\left(\mathrm{e}^{n\,x}\right)}{a^4\,n}+\frac{3\,b\,\ln\left(a+b\,\mathrm{e}^{n\,x}\right)}{a^4\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-n*x)/(a + b*exp(n*x))^3,x)
```

```
[Out] ((6*b^2*exp(2*n*x))/(a^3*n) - 1/(a*n) + (9*b^3*exp(3*n*x))/(2*a^4*n))/(a^2*
exp(n*x) + b^2*exp(3*n*x) + 2*a*b*exp(2*n*x)) - (3*b*log(exp(n*x)))/(a^4*n)
 + (3*b*log(a + b*exp(n*x)))/(a^4*n)
```

3.33 $\int \frac{f^{a+bx}}{c+df^{e+2bx}}\,dx$

Optimal. Leaf size=50

$$\frac{f^{a-\frac{e}{2}}\tan^{-1}\left(\frac{\sqrt{d}\,f^{\frac{e}{2}+bx}}{\sqrt{c}}\right)}{b\sqrt{c}\,\sqrt{d}\,\log(f)}$$

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

Rubi [A]
time = 0.05, antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2281, 211}

$$\frac{f^{a-\frac{e}{2}}\text{ArcTan}\left(\frac{\sqrt{d}\,f^{bx+\frac{e}{2}}}{\sqrt{c}}\right)}{b\sqrt{c}\,\sqrt{d}\,\log(f)}$$

Antiderivative was successfully verified.

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

```
[Out] (f^(a - e/2)*ArcTan[(Sqrt[d]*f^(e/2 + b*x))/Sqrt[c]])/(b*Sqrt[c]*Sqrt[d]*Lo
g[f])
```

Rule 211

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

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{f^{a+bx}}{c+df^{e+2bx}}\,dx = \frac{\text{Subst}\left(\int \frac{1}{c+df^{-2a+e}x^2}\,dx, x, f^{a+bx}\right)}{b\log(f)} = \frac{f^{a-\frac{e}{2}}\tan^{-1}\left(\frac{\sqrt{d}\,f^{\frac{e}{2}+bx}}{\sqrt{c}}\right)}{b\sqrt{c}\,\sqrt{d}\,\log(f)}$$

Mathematica [A]
time = 0.07, size = 50, normalized size = 1.00

$$\frac{f^{a-\frac{e}{2}}\tan^{-1}\left(\frac{\sqrt{d}\,f^{\frac{e}{2}+bx}}{\sqrt{c}}\right)}{b\sqrt{c}\,\sqrt{d}\,\log(f)}$$

Antiderivative was successfully verified.

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

```
[Out] (f^(a - e/2)*ArcTan[(Sqrt[d]*f^(e/2 + b*x))/Sqrt[c]])/(b*Sqrt[c]*Sqrt[d]*Lo
g[f])
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 90 vs. 2(38) = 76.
time = 0.04, size = 91, normalized size = 1.82

method	result	size
risch	$-\frac{f^a \ln\left(f^{bx+a}-\frac{f^a c}{\sqrt{-f^e c d}}\right)}{2\sqrt{-f^e c d}\, b\ln(f)}+\frac{f^a \ln\left(f^{bx+a}+\frac{f^a c}{\sqrt{-f^e c d}}\right)}{2\sqrt{-f^e c d}\, b\ln(f)}$	91

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x+a)/(c+d*f^(2*b*x+e)),x,method=_RETURNVERBOSE)
```

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

Maxima [A]
time = 0.50, size = 37, normalized size = 0.74

$$\frac{f^a \arctan\left(\frac{df^{bx+e}}{\sqrt{cdf^e}}\right)}{\sqrt{cdf^e}\, b\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] f^a*arctan(d*f^(b*x + e)/sqrt(c*d*f^e))/(sqrt(c*d*f^e)*b*log(f))
```

Fricas [A]
time = 0.40, size = 188, normalized size = 3.76

$$\left[-\frac{\sqrt{-cdf^{-2\,a+e}}\log\left(\frac{df^{2\,bx+2\,a}f^{-2\,a+e}-2\,\sqrt{-cdf^{-2\,a+e}}\,f^{bx+a}-c}{df^{2\,bx+2\,a}f^{-2\,a+e}+c}\right)}{2\,bcdf^{-2\,a+e}\log\left(f\right)}, -\frac{\sqrt{cdf^{-2\,a+e}}\arctan\left(\frac{\sqrt{cdf^{-2\,a+e}}}{df^{bx+a}f^{-2\,a+e}}\right)}{bcdf^{-2\,a+e}\log\left(f\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A]
time = 0.41, size = 51, normalized size = 1.02

$$\operatorname{RootSum}\left(4z^2b^2cde^{e\log\left(f\right)}\log\left(f\right)^2+e^{2a\log\left(f\right)},\left(i\mapsto i\log\left(2ibc\log\left(f\right)+f^{a+bx}\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] RootSum(4*_z**2*b**2*c*d*exp(e*log(f))*log(f)**2 + exp(2*a*log(f)), Lambda(
_i, _i*log(2*_i*b*c*log(f) + f**(a + b*x))))
```

Giac [A]
time = 2.94, size = 48, normalized size = 0.96

$$\frac{f^{2\,a}\arctan\left(\frac{df^{bx}f^{e}}{\sqrt{cdf^{e}}}\right)}{\sqrt{cdf^{e}}\,bf^{a}\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] f^(2*a)*arctan(d*f^(b*x)*f^e/sqrt(c*d*f^e))/(sqrt(c*d*f^e)*b*f^a*log(f))
```

Mupad [B]
time = 3.85, size = 64, normalized size = 1.28

$$\frac{\mathrm{atan}\left(\frac{f^{a+b\,x}\,\sqrt{b^2\,c\,d\,f^e\,\ln\left(f\right)^2}}{b\,c\,\ln(f)\,\sqrt{f^{2\,a}}}\right)\,\sqrt{f^{2\,a}}}{\sqrt{b^2\,c\,d\,f^e\,\ln\left(f\right)^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (atan((f^(a + b*x)*(b^2*c*d*f^e*log(f)^2)^(1/2))/(b*c*log(f)*(f^(2*a))^(1/2
)))*(f^(2*a))^(1/2))/(b^2*c*d*f^e*log(f)^2)^(1/2)
```

3.34 $\int \frac{f^{a+2bx}}{c+df^{e+2bx}}\,dx$

Optimal. Leaf size=34

$$\frac{f^{a-e}\log\left(c+df^{e+2bx}\right)}{2bd\log(f)}$$

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

Rubi [A]
time = 0.06, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {2279, 2278, 31}

$$\frac{f^{a-e}\log\left(df^{2bx+e}+c\right)}{2bd\log(f)}$$

Antiderivative was successfully verified.

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

```
[Out] (f^(a - e)*Log[c + d*f^(e + 2*b*x)])/(2*b*d*Log[f])
```

Rule 31

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

Rule 2278

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rule 2279

```
Int[((a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.))^(p_.)*((G_)^((
h_.)*((f_.) + (g_.)*(x_))))^(m_.), x_Symbol] :> Dist[(G^(h*(f + g*x)))^m/(F
^(e*(c + d*x)))^n, Int[(F^(e*(c + d*x)))^n*(a + b*(F^(e*(c + d*x)))^n)^p, x
], x] /; FreeQ[{F, G, a, b, c, d, e, f, g, h, m, n, p}, x] && EqQ[d*e*n*Log
[F], g*h*m*Log[G]]
```

Rubi steps

$$\int \frac{f^{a+2bx}}{c+df^{e+2bx}}\,dx = f^{a-e}\int \frac{f^{e+2bx}}{c+df^{e+2bx}}\,dx$$
$$= \frac{f^{a-e}\text{Subst}\left(\int \frac{1}{c+dx}\,dx, x, f^{e+2bx}\right)}{2b\log(f)}$$
$$= \frac{f^{a-e}\log\left(c+df^{e+2bx}\right)}{2bd\log(f)}$$

Mathematica [A]
time = 0.03, size = 34, normalized size = 1.00

$$\frac{f^{a-e}\log\left(c+df^{e+2bx}\right)}{2bd\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + 2*b*x)/(c + d*f^(e + 2*b*x)),x]
[Out] (f^(a - e)*Log[c + d*f^(e + 2*b*x)])/(2*b*d*Log[f])
```

Maple [A]
time = 0.02, size = 47, normalized size = 1.38

method	result	size
norman	$\frac{f^{-e} f^{a} \ln\left(c+d\,\mathrm{e}^{-\ln(f) a+\ln(f) e} \mathrm{e}^{(2bx+a)\ln(f)}\right)}{2d\ln(f) b}$	47
risch	$-\frac{f^{a} f^{-e} a}{2bd}+\frac{f^{a} f^{-e}\ln\left(f^{2bx+a}+\frac{c\,f^{a} f^{-e}}{d}\right)}{2\ln(f) bd}$	62

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(2*b*x+a)/(c+d*f^(2*b*x+e)),x,method=_RETURNVERBOSE)
[Out] 1/2/(f^e)/d/ln(f)/b*f^a*ln(c+d*exp(-ln(f)*a+ln(f)*e)*exp((2*b*x+a)*ln(f)))
```

Maxima [A]
time = 0.31, size = 32, normalized size = 0.94

$$\frac{f^{a-e}\log\left(df^{2\,bx+e}+c\right)}{2\,bd\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*f^(a - e)*log(d*f^(2*b*x + e) + c)/(b*d*log(f))
```

Fricas [A]
time = 0.36, size = 34, normalized size = 1.00

$$\frac{f^{a-e}\log\left(df^{2\,bx+e}+c\right)}{2\,bd\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*f^(a - e)*log(d*f^(2*b*x + e) + c)/(b*d*log(f))
```

Sympy [A]
time = 0.48, size = 42, normalized size = 1.24

$$\frac{e^{(a-e)\log\left(f\right)}\log\left(\frac{ce^{a\log\left(f\right)}e^{-e\log\left(f\right)}}{d}+f^{a+2bx}\right)}{2bd\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] exp((a - e)*log(f))*log(c*exp(a*log(f))*exp(-e*log(f))/d + f**(a + 2*b*x))/
(2*b*d*log(f))
```

Giac [A]
time = 3.06, size = 37, normalized size = 1.09

$$\frac{f^{a}\log\left(\left|df^{2\,bx}f^{e}+c\right|\right)}{2\,bdf^{e}\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*f^a*log(abs(d*f^(2*b*x)*f^e + c))/(b*d*f^e*log(f))
```

Mupad [B]
time = 3.63, size = 37, normalized size = 1.09

$$\frac{f^{a-e}\,\ln\left(d\,f^{a+e+2\,b\,x}+c\,f^{a}\right)}{2\,b\,d\,\ln\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (f^(a - e)*log(d*f^(a + e + 2*b*x) + c*f^a))/(2*b*d*log(f))
```

3.35 $\int \frac{f^{a+3bx}}{c+df^{e+2bx}}\,dx$

Optimal. Leaf size=88

$$\frac{f^{\frac{1}{2}(2a-3e)+\frac{1}{2}(e+2bx)}}{bd\log(f)}-\frac{\sqrt{c}\,f^{a-\frac{3e}{2}}\tan^{-1}\left(\frac{\sqrt{d}\,f^{\frac{1}{2}(e+2bx)}}{\sqrt{c}}\right)}{bd^{3/2}\log(f)}$$

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

Rubi [A]
time = 0.05, antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.130$, Rules used = {2280, 327, 211}

$$\frac{f^{\frac{1}{2}(2a-3e)+\frac{1}{2}(2bx+e)}}{bd\log(f)}-\frac{\sqrt{c}\,f^{a-\frac{3e}{2}}\text{ArcTan}\left(\frac{\sqrt{d}\,f^{\frac{1}{2}(2bx+e)}}{\sqrt{c}}\right)}{bd^{3/2}\log(f)}$$

Antiderivative was successfully verified.

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

```
[Out] f^((2*a - 3*e)/2 + (e + 2*b*x)/2)/(b*d*Log[f]) - (Sqrt[c]*f^(a - (3*e)/2)*A
rcTan[(Sqrt[d]*f^((e + 2*b*x)/2))/Sqrt[c]])/(b*d^(3/2)*Log[f])
```

Rule 211

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

Rule 327

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

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
```

```
e, f, g, h, p}, x]
```

Rubi steps

$$
\begin{aligned}
\int \frac{f^{a+3bx}}{c+df^{e+2bx}}\,dx &= \frac{f^{a-\frac{3e}{2}}\operatorname{Subst}\left(\int \frac{x^2}{c+dx^2}\,dx,x,f^{\frac{1}{2}(e+2bx)}\right)}{b\log(f)} \\
&= \frac{f^{\frac{1}{2}(2a-3e)+\frac{1}{2}(e+2bx)}}{bd\log(f)} - \frac{\left(cf^{a-\frac{3e}{2}}\right)\operatorname{Subst}\left(\int \frac{1}{c+dx^2}\,dx,x,f^{\frac{1}{2}(e+2bx)}\right)}{bd\log(f)} \\
&= \frac{f^{\frac{1}{2}(2a-3e)+\frac{1}{2}(e+2bx)}}{bd\log(f)} - \frac{\sqrt{c}\,f^{a-\frac{3e}{2}}\tan^{-1}\left(\frac{\sqrt{d}\,f^{\frac{1}{2}(e+2bx)}}{\sqrt{c}}\right)}{bd^{3/2}\log(f)}
\end{aligned}
$$

Mathematica [A]
time = 0.11, size = 67, normalized size = 0.76

$$
\frac{f^a\left(\frac{f^{-e+bx}}{d}-\frac{\sqrt{c}\,f^{-3e/2}\tan^{-1}\left(\frac{\sqrt{d}\,f^{\frac{e}{2}+bx}}{\sqrt{c}}\right)}{d^{3/2}}\right)}{b\log(f)}
$$

Antiderivative was successfully verified.

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

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

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 170 vs. $2(61) = 122$.
time = 0.06, size = 171, normalized size = 1.94

method	result
risch	$\frac{f^{-e} f^{\frac{2a}{3}} f^{bx+\frac{a}{3}}}{d\ln(f)b}+\frac{\sqrt{-cd}\, f^{a} f^{-\frac{3e}{2}}\ln\left(f^{bx+\frac{a}{3}}-\frac{\sqrt{-cd}\, f^{\frac{a}{3}} f^{-\frac{e}{2}}}{d}\right)}{2d^{2}b\ln(f)}-\frac{\sqrt{-cd}\, f^{a} f^{-\frac{3e}{2}}\ln\left(f^{bx+\frac{a}{3}}+\frac{\sqrt{-cd}\, f^{\frac{a}{3}} f^{-\frac{e}{2}}}{d}\right)}{2d^{2}b\ln(f)}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(3*b*x+a)/(c+d*f^(2*b*x+e)),x,method=_RETURNVERBOSE)
```

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

```
(-1/3*a))/(f^(1/2*e)))-1/2/d^2*(-c*d)^(1/2)/b/(f^(-1/3*a))^3/(f^(1/2*e))^3/
ln(f)*ln(f^(b*x+1/3*a)+1/d*(-c*d)^(1/2)/(f^(-1/3*a))/(f^(1/2*e)))
```

Maxima [A]
time = 0.52, size = 68, normalized size = 0.77

$$-\frac{cf^{a-e}\arctan\left(\frac{df^{bx+e}}{\sqrt{cdf^{e}}}\right)}{\sqrt{cdf^{e}}\,bd\log\left(f\right)}+\frac{f^{bx+a-e}}{bd\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -c*f^(a - e)*arctan(d*f^(b*x + e)/sqrt(c*d*f^e))/(sqrt(c*d*f^e)*b*d*log(f))
 + f^(b*x + a - e)/(b*d*log(f))
```

Fricas [A]
time = 0.42, size = 234, normalized size = 2.66

$$\left[\frac{\sqrt{-\frac{c}{df^{-\frac{2}{3}a+e}}}\log\left(-\frac{2\,df^{bx+\frac{1}{3}a}f^{-\frac{2}{3}a+e}\sqrt{-\frac{c}{df^{-\frac{2}{3}a+e}}}-df^{2\,bx+\frac{2}{3}a}f^{-\frac{2}{3}a+e}+c}{df^{2\,bx+\frac{2}{3}a}f^{-\frac{2}{3}a+e}+c}\right)+2\,f^{bx+\frac{1}{3}a}}{2\,bdf^{-\frac{2}{3}a+e}\log\left(f\right)},\,-\frac{\sqrt{\frac{c}{df^{-\frac{2}{3}a+e}}}\arctan\left(\frac{df^{bx+\frac{1}{3}a}f^{-\frac{2}{3}a+e}\sqrt{\frac{c}{df^{-\frac{2}{3}a+e}}}}{c}\right)-f^{bx+\frac{1}{3}a}}{bdf^{-\frac{2}{3}a+e}\log\left(f\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A]
time = 0.83, size = 110, normalized size = 1.25

$$\operatorname{RootSum}\left(4z^{2}b^{2}d^{3}e^{3e\log\left(f\right)}\log\left(f\right)^{2}+ce^{2a\log\left(f\right)},\left(i\mapsto i\log\left(-2ibde^{-\frac{2a\log\left(f\right)}{3}}e^{e\log\left(f\right)}\log\left(f\right)+e^{\frac{\left(a+3bx\right)\log\left(f\right)}{3}}\right)\right)\right)+\frac{\left(\begin{cases}x & \text{for}\: b=0\vee f=1\\\frac{e^{bx\log\left(f\right)}}{b\log\left(f\right)} & \text{otherwise}\end{cases}\right)e^{a\log\left(f\right)}e^{-e\log\left(f\right)}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] RootSum(4*_z**2*b**2*d**3*exp(3*e*log(f))*log(f)**2 + c*exp(2*a*log(f)), La
mbda(_i, _i*log(-2*_i*b*d*exp(-2*a*log(f)/3)*exp(e*log(f))*log(f) + exp((a
```

```
+ 3*b*x)*log(f)/3)))) + Piecewise((x, Eq(b, 0) | Eq(f, 1)), (exp(b*x*log(f)
)/(b*log(f)), True))*exp(a*log(f))*exp(-e*log(f))/d
```

Giac [A]
time = 3.13, size = 74, normalized size = 0.84

$$-\frac{f^a\left(\frac{c\arctan\left(\frac{df^{bx}f^e}{\sqrt{cdf^e}}\right)}{\sqrt{cdf^e}\,df^e\log(f)}-\frac{f^{bx}}{df^e\log(f)}\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -f^a*(c*arctan(d*f^(b*x)*f^e/sqrt(c*d*f^e))/(sqrt(c*d*f^e)*d*f^e*log(f)) -
f^(b*x)/(d*f^e*log(f)))/b
```

Mupad [B]
time = 3.55, size = 66, normalized size = 0.75

$$-\frac{f^a\,\mathrm{e}^{-\frac{3\,e\,\ln(f)}{2}}\,\left(c\,\mathrm{atan}\left(\frac{d\,f^{b\,x}\,\mathrm{e}^{\frac{e\,\ln(f)}{2}}}{\sqrt{c\,d}}\right)-f^{b\,x}\,\mathrm{e}^{\frac{e\,\ln(f)}{2}}\,\sqrt{c\,d}\right)}{b\,d\,\ln\left(f\right)\,\sqrt{c\,d}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -(f^a*exp(-(3*e*log(f))/2)*(c*atan((d*f^(b*x)*exp((e*log(f))/2))/(c*d)^(1/2
)) - f^(b*x)*exp((e*log(f))/2)*(c*d)^(1/2)))/(b*d*log(f)*(c*d)^(1/2))
```

3.36 $\int \frac{f^{a+4bx}}{c+df^{e+2bx}}\,dx$

Optimal. Leaf size=61

$$\frac{f^{a-e+2bx}}{2bd\log(f)}-\frac{cf^{a-2e}\log\left(c+df^{e+2bx}\right)}{2bd^2\log(f)}$$

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

Rubi [A]
time = 0.04, antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}=0.087$, Rules used = {2280, 45}

$$\frac{f^{a+2bx-e}}{2bd\log(f)}-\frac{cf^{a-2e}\log\left(df^{2bx+e}+c\right)}{2bd^2\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + 4*b*x)/(c + d*f^(e + 2*b*x)),x]
```

```
[Out] f^(a - e + 2*b*x)/(2*b*d*Log[f]) - (c*f^(a - 2*e)*Log[c + d*f^(e + 2*b*x)])
/(2*b*d^2*Log[f])
```

Rule 45

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

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{f^{a+4bx}}{c+df^{e+2bx}}\,dx = \frac{f^{a-2e}\text{Subst}\left(\int \frac{x}{c+dx}\,dx, x, f^{e+2bx}\right)}{2b\log(f)}$$
$$= \frac{f^{a-2e}\text{Subst}\left(\int \left(\frac{1}{d}-\frac{c}{d(c+dx)}\right)\,dx, x, f^{e+2bx}\right)}{2b\log(f)}$$
$$= \frac{f^{a-e+2bx}}{2bd\log(f)} - \frac{cf^{a-2e}\log\left(c+df^{e+2bx}\right)}{2bd^2\log(f)}$$

Mathematica [A]
time = 0.39, size = 73, normalized size = 1.20

$$\frac{f^{a-2e}\left(df^{e+2bx}-2bcx\log(f)-c\log\left(c+df^{e+2bx}\right)+c\log\left(bd^3f^{e+2bx}\log(f)\right)\right)}{2bd^2\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + 4*b*x)/(c + d*f^(e + 2*b*x)),x]
```

```
[Out] (f^(a - 2*e)*(d*f^(e + 2*b*x) - 2*b*c*x*Log[f] - c*Log[c + d*f^(e + 2*b*x)]
 + c*Log[b*d^3*f^(e + 2*b*x)*Log[f]]))/(2*b*d^2*Log[f])
```

Maple [A]
time = 0.03, size = 76, normalized size = 1.25

method	result	size
norman	$\frac{f^{-2e}f^{a}\mathrm{e}^{(2bx+e)\ln(f)}}{2\ln(f)bd}-\frac{c\,f^{-2e}f^{a}\ln\left(c+d\,\mathrm{e}^{(2bx+e)\ln(f)}\right)}{2\ln(f)b\,d^{2}}$	76
risch	$\frac{f^{a}f^{-2e}f^{2bx+e}}{2\ln(f)bd}+\frac{f^{a}f^{-2e}ce}{2b\,d^{2}}-\frac{f^{a}f^{-2e}c\ln\left(f^{2bx+e}+\frac{c}{d}\right)}{2\ln(f)b\,d^{2}}$	96

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(4*b*x+a)/(c+d*f^(2*b*x+e)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/(f^e)^2/ln(f)/b/d*(f^(1/2*a))^2*exp((2*b*x+e)*ln(f))-1/2/ln(f)/b/d^2*c/
(f^e)^2*(f^(1/2*a))^2*ln(c+d*exp((2*b*x+e)*ln(f)))
```

Maxima [A]
time = 0.29, size = 65, normalized size = 1.07

$$-\frac{cf^{a-2\,e}\log\left(df^{2\,bx+e}+c\right)}{2\,bd^2\log\left(f\right)}+\frac{\left(df^{2\,bx+e}+c\right)f^{a-2\,e}}{2\,bd^2\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(4*b*x+a)/(c+d*f^(2*b*x+e)),x, algorithm="maxima")
```

```
[Out] -1/2*c*f^(a - 2*e)*log(d*f^(2*b*x + e) + c)/(b*d^2*log(f)) + 1/2*(d*f^(2*b*
x + e) + c)*f^(a - 2*e)/(b*d^2*log(f))
```

Fricas [A]
time = 0.37, size = 57, normalized size = 0.93

$$\frac{df^{2\,bx+e}f^{a-2\,e}-cf^{a-2\,e}\log\left(df^{2\,bx+e}+c\right)}{2\,bd^{2}\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(4*b*x+a)/(c+d*f^(2*b*x+e)),x, algorithm="fricas")
```

```
[Out] 1/2*(d*f^(2*b*x + e)*f^(a - 2*e) - c*f^(a - 2*e)*log(d*f^(2*b*x + e) + c))/
(b*d^2*log(f))
```

Sympy [A]
time = 0.60, size = 92, normalized size = 1.51

$$\frac{\left(\begin{cases} x & \text{for}\: b=0 \vee f=1 \\ \frac{e^{2bx\log\left(f\right)}}{2b\log\left(f\right)} & \text{otherwise} \end{cases}\right)e^{a\log\left(f\right)}e^{-e\log\left(f\right)}}{d}-\frac{ce^{(a-2e)\log\left(f\right)}\log\left(\frac{ce^{\frac{a\log\left(f\right)}{2}}e^{-e\log\left(f\right)}}{d}+\sqrt{e^{(a+4bx)\log\left(f\right)}}\right)}{2bd^{2}\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(4*b*x+a)/(c+d*f**(2*b*x+e)),x)
```

```
[Out] Piecewise((x, Eq(b, 0) | Eq(f, 1)), (exp(2*b*x*log(f))/(2*b*log(f)), True))
*exp(a*log(f))*exp(-e*log(f))/d - c*exp((a - 2*e)*log(f))*log(c*exp(a*log(f
)/2)*exp(-e*log(f))/d + sqrt(exp((a + 4*b*x)*log(f))))/(2*b*d**2*log(f))
```

Giac [A]
time = 2.43, size = 69, normalized size = 1.13

$$\frac{f^{a}\left(\frac{f^{2\,bx}f^{e}}{df^{2\,e}\log(f)}-\frac{c\log\left(\left|df^{2\,bx}f^{e}+c\right|\right)}{d^{2}f^{2\,e}\log(f)}\right)}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(4*b*x+a)/(c+d*f^(2*b*x+e)),x, algorithm="giac")
```

```
[Out] 1/2*f^a*(f^(2*b*x)*f^e/(d*f^(2*e)*log(f)) - c*log(abs(d*f^(2*b*x)*f^e + c))
/(d^2*f^(2*e)*log(f)))/b
```

Mupad [B]
time = 3.54, size = 47, normalized size = 0.77

$$-\frac{f^{a-2\,e}\left(\frac{c\,\ln\left(c+d\,f^{e+2\,b\,x}\right)}{2}-\frac{d\,f^{e+2\,b\,x}}{2}\right)}{b\,d^{2}\,\ln\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + 4*b*x)/(c + d*f^(e + 2*b*x)),x)
```

```
[Out] -(f^(a - 2*e)*((c*log(c + d*f^(e + 2*b*x)))/2 - (d*f^(e + 2*b*x))/2))/(b*d^
2*log(f))
```

3.37 $\int \frac{f^{a+5bx}}{c+df^{e+2bx}}\,dx$

Optimal. Leaf size=127

$$-\frac{cf^{\frac{1}{2}(2a-5e)+\frac{1}{2}(e+2bx)}}{bd^2\log(f)}+\frac{f^{\frac{1}{2}(2a-5e)+\frac{3}{2}(e+2bx)}}{3bd\log(f)}+\frac{c^{3/2}f^{a-\frac{5e}{2}}\tan^{-1}\left(\frac{\sqrt{d}\,f^{\frac{1}{2}(e+2bx)}}{\sqrt{c}}\right)}{bd^{5/2}\log(f)}$$

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

Rubi [A]
time = 0.06, antiderivative size = 127, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.130$, Rules used = {2280, 308, 211}

$$\frac{c^{3/2}f^{a-\frac{5e}{2}}\text{ArcTan}\left(\frac{\sqrt{d}\,f^{\frac{1}{2}(2bx+e)}}{\sqrt{c}}\right)}{bd^{5/2}\log(f)}-\frac{cf^{\frac{1}{2}(2a-5e)+\frac{1}{2}(2bx+e)}}{bd^2\log(f)}+\frac{f^{\frac{1}{2}(2a-5e)+\frac{3}{2}(2bx+e)}}{3bd\log(f)}$$

Antiderivative was successfully verified.

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

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

Rule 211

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

Rule 308

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

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
```

```
e, f, g, h, p}, x]
```

Rubi steps

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

Mathematica [A]
time = 0.11, size = 86, normalized size = 0.68

$$\frac{\sqrt{d}\,f^{a-2e+bx}\left(-3c+df^{e+2bx}\right)+3c^{3/2}f^{a-\frac{5e}{2}}\tan^{-1}\left(\frac{\sqrt{d}\,f^{\frac{e}{2}+bx}}{\sqrt{c}}\right)}{3bd^{5/2}\log(f)}$$

Antiderivative was successfully verified.

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

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

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 211 vs. 2(85) = 170.
time = 0.06, size = 212, normalized size = 1.67

method	result
risch	$\frac{f^{-e}f^{\frac{2a}{5}}f^{3bx+\frac{3a}{5}}}{3d\ln(f)b}-\frac{c\,f^{-2e}f^{\frac{4a}{5}}f^{bx+\frac{a}{5}}}{d^2\ln(f)b}+\frac{\sqrt{-cd}\,c\,f^a f^{-\frac{5e}{2}}\ln\left(f^{bx+\frac{a}{5}}+\frac{\sqrt{-cd}\,f^{\frac{a}{5}}f^{-\frac{e}{2}}}{d}\right)}{2d^3b\ln(f)}-\frac{\sqrt{-cd}\,c\,f^a f^{-\frac{5e}{2}}\ln\left(f^{bx+}\right.}{2d^3b\ln(}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(5*b*x+a)/(c+d*f^(2*b*x+e)),x,method=_RETURNVERBOSE)
```

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

Maxima [A]
time = 0.48, size = 89, normalized size = 0.70

$$\frac{c^2 f^{a-2\,e} \arctan\left(\frac{df^{bx+e}}{\sqrt{cdf^e}}\right)}{\sqrt{cdf^e}\,bd^2 \log\left(f\right)} + \frac{df^{3\,bx+a+e} - 3\,cf^{bx+a}}{3\,bd^2 f^{2\,e} \log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] c^2*f^(a - 2*e)*arctan(d*f^(b*x + e)/sqrt(c*d*f^e))/(sqrt(c*d*f^e)*b*d^2*lo
g(f)) + 1/3*(d*f^(3*b*x + a + e) - 3*c*f^(b*x + a))/(b*d^2*f^(2*e)*log(f))
```

Fricas [A]
time = 0.41, size = 285, normalized size = 2.24

$$\left[\frac{2\,df^{3\,bx+\frac{3}{5}\,a}f^{-\frac{2}{5}\,a+e} + 3\,c\sqrt{-\frac{c}{df^{-\frac{2}{5}\,a+e}}}\log\left(\frac{2\,df^{bx+\frac{1}{5}\,a}f^{-\frac{2}{5}\,a+e}\sqrt{-\frac{c}{df^{-\frac{2}{5}\,a+e}}}+df^{2\,bx+\frac{2}{5}\,a}f^{-\frac{2}{5}\,a+e}-c}{df^{2\,bx+\frac{2}{5}\,a}f^{-\frac{2}{5}\,a+e}+c}\right) - 6\,cf^{bx+\frac{1}{5}\,a}}{6\,bd^2 f^{-\frac{4}{5}\,a+2\,e}\log\left(f\right)},\ \frac{df^{3\,bx+\frac{3}{5}\,a}f^{-\frac{2}{5}\,a+e} + 3\,c\sqrt{\frac{c}{df^{-\frac{2}{5}\,a+e}}}\arctan\left(\frac{df^{bx+\frac{1}{5}\,a}f^{-\frac{2}{5}\,a+e}\sqrt{\frac{c}{df^{-\frac{2}{5}\,a+e}}}}{c}\right) - 3\,cf^{bx+\frac{1}{5}\,a}}{3\,bd^2 f^{-\frac{4}{5}\,a+2\,e}\log\left(f\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] [1/6*(2*d*f^(3*b*x + 3/5*a)*f^(-2/5*a + e) + 3*c*sqrt(-c/(d*f^(-2/5*a + e))
)*log((2*d*f^(b*x + 1/5*a)*f^(-2/5*a + e)*sqrt(-c/(d*f^(-2/5*a + e))) + d*f
^(2*b*x + 2/5*a)*f^(-2/5*a + e) - c)/(d*f^(2*b*x + 2/5*a)*f^(-2/5*a + e) +
c)) - 6*c*f^(b*x + 1/5*a))/(b*d^2*f^(-4/5*a + 2*e)*log(f)), 1/3*(d*f^(3*b*x
 + 3/5*a)*f^(-2/5*a + e) + 3*c*sqrt(c/(d*f^(-2/5*a + e)))*arctan(d*f^(b*x +
 1/5*a)*f^(-2/5*a + e)*sqrt(c/(d*f^(-2/5*a + e)))/c) - 3*c*f^(b*x + 1/5*a))
/(b*d^2*f^(-4/5*a + 2*e)*log(f))]
```

Sympy [A]
time = 0.89, size = 184, normalized size = 1.45

$$\operatorname{RootSum}\left(4z^2b^2d^5e^{5e\log\left(f\right)}\log\left(f\right)^2 + c^3e^{2a\log\left(f\right)},\ \left(i \mapsto i\log\left(\frac{2ibd^2e^{-\frac{4a\log\left(f\right)}{5}}e^{2e\log\left(f\right)}\log\left(f\right)}{c} + e^{\frac{(a+5bx)\log\left(f\right)}{5}}\right)\right)\right) + \frac{\left(\begin{cases} x\left(-c+d\right) & \text{for}\ f=1 \wedge \left(b=0 \vee f=1\right) \\ x\left(-ce^{a\log\left(f\right)} + de^{a\log\left(f\right)}e^{e\log\left(f\right)}\right) & \text{for}\ b=0 \\ -\frac{ce^{a\log\left(f\right)}e^{bx\log\left(f\right)}}{b\log\left(f\right)} + \frac{de^{a\log\left(f\right)}e^{e\log\left(f\right)}e^{3bx\log\left(f\right)}}{3b\log\left(f\right)} & \text{otherwise} \end{cases}\right)e^{-2e\log\left(f\right)}}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] RootSum(4*_z**2*b**2*d**5*exp(5*e*log(f))*log(f)**2 + c**3*exp(2*a*log(f)),
 Lambda(_i, _i*log(2*_i*b*d**2*exp(-4*a*log(f)/5)*exp(2*e*log(f))*log(f)/c
+ exp((a + 5*b*x)*log(f)/5)))) + Piecewise((x*(-c + d), Eq(f, 1) & (Eq(b, 0
) | Eq(f, 1))), (x*(-c*exp(a*log(f)) + d*exp(a*log(f))*exp(e*log(f))), Eq(b
, 0)), (-c*exp(a*log(f))*exp(b*x*log(f))/(b*log(f)) + d*exp(a*log(f))*exp(e
*log(f))*exp(3*b*x*log(f))/(3*b*log(f)), True))*exp(-2*e*log(f))/d**2
```

Giac [A]
time = 2.63, size = 113, normalized size = 0.89

$$\frac{f^a\left(\frac{3\,c^2\arctan\left(\frac{df^{bx}f^e}{\sqrt{cdf^e}}\right)}{\sqrt{cdf^e}\,d^2f^{2\,e}\log(f)}+\frac{d^2f^{3\,bx}f^{2\,e}\log(f)^2-3\,cdf^{bx}f^e\log(f)^2}{d^3f^{3\,e}\log(f)^3}\right)}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Mupad [B]
time = 3.56, size = 102, normalized size = 0.80

$$\frac{f^a\,f^{3\,b\,x}}{3\,b\,d\,f^e\,\ln\left(f\right)}-\frac{c\,f^a\,f^{b\,x}}{b\,d^2\,f^{2\,e}\,\ln\left(f\right)}+\frac{c^2\,f^a\,\mathrm{e}^{-\frac{5\,e\,\ln(f)}{2}}\,\mathrm{atan}\left(\frac{d\,f^{b\,x}\,\mathrm{e}^{\frac{e\,\ln(f)}{2}}}{\sqrt{c\,d}}\right)}{b\,d^2\,\ln\left(f\right)\,\sqrt{c\,d}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (f^a*f^(3*b*x))/(3*b*d*f^e*log(f)) - (c*f^a*f^(b*x))/(b*d^2*f^(2*e)*log(f))
 + (c^2*f^a*exp(-(5*e*log(f))/2)*atan((d*f^(b*x)*exp((e*log(f))/2))/(c*d)^(
1/2)))/(b*d^2*log(f)*(c*d)^(1/2))
```

3.38 $\int \frac{e^x}{1+e^{2x}}\,dx$

Optimal. Leaf size=4

$$\tan^{-1}(e^x)$$

```
[Out] arctan(exp(x))
```

Rubi [A]
time = 0.01, antiderivative size = 4, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2281, 209}

$$\text{ArcTan}(e^x)$$

Antiderivative was successfully verified.

```
[In] Int[E^x/(1 + E^(2*x)),x]
```

```
[Out] ArcTan[E^x]
```

Rule 209

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

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^x}{1+e^{2x}}\,dx &= \text{Subst}\left(\int \frac{1}{1+x^2}\,dx, x, e^x\right)\\ &= \tan^{-1}(e^x)\end{aligned}$$

Mathematica [A]
time = 0.01, size = 4, normalized size = 1.00

$$\tan^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(1 + E^(2*x)),x]
```

```
[Out] ArcTan[E^x]
```

Maple [A]
time = 0.02, size = 4, normalized size = 1.00

method	result	size
default	$\arctan\left(\mathrm{e}^{x}\right)$	4
risch	$\frac{i \ln\left(\mathrm{e}^{x}+i\right)}{2}-\frac{i \ln\left(\mathrm{e}^{x}-i\right)}{2}$	20

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(1+exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] arctan(exp(x))
```

Maxima [A]
time = 0.48, size = 3, normalized size = 0.75

$$\arctan\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(2*x)),x, algorithm="maxima")
```

```
[Out] arctan(e^x)
```

Fricas [A]
time = 0.37, size = 3, normalized size = 0.75

$$\arctan\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(2*x)),x, algorithm="fricas")
```

```
[Out] arctan(e^x)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 15 vs. $2(3) = 6$.
time = 0.04, size = 15, normalized size = 3.75

$$\operatorname{RootSum}\left(4z^{2}+1,\left(i \mapsto i \log\left(2i+e^{x}\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(2*x)),x)
```

```
[Out] RootSum(4*_z**2 + 1, Lambda(_i, _i*log(2*_i + exp(x))))
```

Giac [**A**]
time = 2.80, size = 3, normalized size = 0.75

$$\arctan\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(2*x)),x, algorithm="giac")
```

```
[Out] arctan(e^x)
```

Mupad [**B**]
time = 3.47, size = 3, normalized size = 0.75

$$\mathrm{atan}(\mathrm{e}^{x})$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(2*x) + 1),x)
```

```
[Out] atan(exp(x))
```

3.39 $\int \frac{e^x}{1-e^{2x}}\,dx$

Optimal. Leaf size=4

$$\tanh^{-1}(e^x)$$

```
[Out] arctanh(exp(x))
```

Rubi [A]
time = 0.01, antiderivative size = 4, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {2281, 212}

$$\tanh^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Int[E^x/(1 - E^(2*x)),x]
```

```
[Out] ArcTanh[E^x]
```

Rule 212

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

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^x}{1-e^{2x}}\,dx &= \text{Subst}\left(\int \frac{1}{1-x^2}\,dx, x, e^x\right)\\ &= \tanh^{-1}(e^x)\end{aligned}$$

Mathematica [A]
time = 0.02, size = 4, normalized size = 1.00

$$\tanh^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(1 - E^(2*x)),x]
```

```
[Out] ArcTanh[E^x]
```

Maple [A]
time = 0.02, size = 4, normalized size = 1.00

method	result	size
default	$\operatorname{arctanh}\left(e^{x}\right)$	4
norman	$-\frac{\ln(-1+e^{x})}{2}+\frac{\ln(1+e^{x})}{2}$	16
risch	$-\frac{\ln(-1+e^{x})}{2}+\frac{\ln(1+e^{x})}{2}$	16

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(1-exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] arctanh(exp(x))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 15 vs. $2(3) = 6$.
time = 0.29, size = 15, normalized size = 3.75

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1-exp(2*x)),x, algorithm="maxima")
```

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

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 15 vs. $2(3) = 6$.
time = 0.38, size = 15, normalized size = 3.75

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1-exp(2*x)),x, algorithm="fricas")
```

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

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 15 vs. $2(3) = 6$.
time = 0.03, size = 15, normalized size = 3.75

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1-exp(2*x)),x)
```

```
[Out] -log(exp(x) - 1)/2 + log(exp(x) + 1)/2
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 16 vs. $2(3) = 6$.
time = 1.48, size = 16, normalized size = 4.00

$$\frac{1}{2}\log\left(e^{x}+1\right)-\frac{1}{2}\log\left(|e^{x}-1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1-exp(2*x)),x, algorithm="giac")
```

```
[Out] 1/2*log(e^x + 1) - 1/2*log(abs(e^x - 1))
```

Mupad [B]
time = 0.13, size = 15, normalized size = 3.75

$$\frac{\ln\left(e^{x}+1\right)}{2}-\frac{\ln\left(e^{x}-1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-exp(x)/(exp(2*x) - 1),x)
```

```
[Out] log(exp(x) + 1)/2 - log(exp(x) - 1)/2
```

3.40 $\int \frac{e^x x}{1-e^{2x}} \, dx$

Optimal. Leaf size=27

$$x \tanh^{-1}(e^x) + \frac{\text{Li}_2(-e^x)}{2} - \frac{\text{Li}_2(e^x)}{2}$$

```
[Out] x*arctanh(exp(x))+1/2*polylog(2,-exp(x))-1/2*polylog(2,exp(x))
```

Rubi [A]
time = 0.04, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.312$, Rules used = {2281, 212, 2277, 2320, 6031}

$$\frac{1}{2}\text{PolyLog}(2, -e^x) - \frac{1}{2}\text{PolyLog}(2, e^x) + x \tanh^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Int[(E^x*x)/(1 - E^(2*x)),x]
```

```
[Out] x*ArcTanh[E^x] + PolyLog[2, -E^x]/2 - PolyLog[2, E^x]/2
```

Rule 212

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

Rule 2277

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
```

```
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6031

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

Rubi steps

$$\begin{aligned}\int \frac{e^x x}{1-e^{2x}}\,dx &= x\tanh^{-1}\left(e^x\right)-\int \tanh^{-1}\left(e^x\right)\,dx\\ &= x\tanh^{-1}\left(e^x\right)-\text{Subst}\left(\int \frac{\tanh^{-1}(x)}{x}\,dx,x,e^x\right)\\ &= x\tanh^{-1}\left(e^x\right)+\frac{\text{Li}_2(-e^x)}{2}-\frac{\text{Li}_2(e^x)}{2}\end{aligned}$$

Mathematica [A]
time = 0.08, size = 38, normalized size = 1.41

$$\frac{1}{2}(x(-\log(1-e^x)+\log(1+e^x))+\text{Li}_2(-e^x)-\text{Li}_2(e^x))$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^x*x)/(1 - E^(2*x)),x]
[Out] (x*(-Log[1 - E^x] + Log[1 + E^x]) + PolyLog[2, -E^x] - PolyLog[2, E^x])/2
```

Maple [A]
time = 0.03, size = 34, normalized size = 1.26

method	result	size
default	$-\frac{x\ln(1-e^x)}{2}-\frac{\text{polylog}(2,e^x)}{2}+\frac{x\ln(1+e^x)}{2}+\frac{\text{polylog}(2,-e^x)}{2}$	34
risch	$-\frac{x\ln(1-e^x)}{2}-\frac{\text{polylog}(2,e^x)}{2}+\frac{x\ln(1+e^x)}{2}+\frac{\text{polylog}(2,-e^x)}{2}$	34

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*x/(1-exp(2*x)),x,method=_RETURNVERBOSE)
[Out] -1/2*x*ln(1-exp(x))-1/2*polylog(2,exp(x))+1/2*x*ln(1+exp(x))+1/2*polylog(2,
-exp(x))
```

Maxima [A]
time = 0.29, size = 31, normalized size = 1.15

$$\frac{1}{2}\,x\log\left(e^{x}+1\right)-\frac{1}{2}\,x\log\left(-e^{x}+1\right)+\frac{1}{2}\,\mathrm{Li}_2(-e^{x})-\frac{1}{2}\,\mathrm{Li}_2(e^{x})$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x/(1-exp(2*x)),x, algorithm="maxima")
[Out] 1/2*x*log(e^x + 1) - 1/2*x*log(-e^x + 1) + 1/2*dilog(-e^x) - 1/2*dilog(e^x)
```

Fricas [A]
time = 0.37, size = 31, normalized size = 1.15

$$\frac{1}{2}\,x\log\left(e^{x}+1\right)-\frac{1}{2}\,x\log\left(-e^{x}+1\right)+\frac{1}{2}\,\mathrm{Li}_2(-e^{x})-\frac{1}{2}\,\mathrm{Li}_2(e^{x})$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x/(1-exp(2*x)),x, algorithm="fricas")
[Out] 1/2*x*log(e^x + 1) - 1/2*x*log(-e^x + 1) + 1/2*dilog(-e^x) - 1/2*dilog(e^x)
```

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

$$-\int\frac{xe^{x}}{e^{2x}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x/(1-exp(2*x)),x)
[Out] -Integral(x*exp(x)/(exp(2*x) - 1), x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x/(1-exp(2*x)),x, algorithm="giac")
[Out] integrate(-x*e^x/(e^(2*x) - 1), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.04

$$-\int\frac{x\,\mathrm{e}^{x}}{\mathrm{e}^{2\,x}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(x*exp(x))/(exp(2*x) - 1),x)
[Out] -int((x*exp(x))/(exp(2*x) - 1), x)
```

3.41 $\int \frac{e^x x^2}{1-e^{2x}}\,dx$

Optimal. Leaf size=40

$$x^2\tanh^{-1}(e^x)+x\text{Li}_2(-e^x)-x\text{Li}_2(e^x)-\text{Li}_3(-e^x)+\text{Li}_3(e^x)$$

```
[Out] x^2*arctanh(exp(x))+x*polylog(2,-exp(x))-x*polylog(2,exp(x))-polylog(3,-exp
(x))+polylog(3,exp(x))
```

Rubi [A]
time = 0.07, antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.389$, Rules used = {2281, 212, 2277, 6348, 2611, 2320, 6724}

$$x\text{PolyLog}(2,-e^x)-x\text{PolyLog}(2,e^x)-\text{PolyLog}(3,-e^x)+\text{PolyLog}(3,e^x)+x^2\tanh^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Int[(E^x*x^2)/(1 - E^(2*x)),x]
```

```
[Out] x^2*ArcTanh[E^x] + x*PolyLog[2, -E^x] - x*PolyLog[2, E^x] - PolyLog[3, -E^x
] + PolyLog[3, E^x]
```

Rule 212

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

Rule 2277

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 6348

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

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$
\begin{aligned}
\int \frac{e^x x^2}{1-e^{2x}}\,dx &= x^2\tanh^{-1}\left(e^x\right)-2\int x\tanh^{-1}\left(e^x\right)\,dx\\
&= x^2\tanh^{-1}\left(e^x\right)+\int x\log\left(1-e^x\right)\,dx-\int x\log\left(1+e^x\right)\,dx\\
&= x^2\tanh^{-1}\left(e^x\right)+x\mathrm{Li}_2(-e^x)-x\mathrm{Li}_2(e^x)-\int \mathrm{Li}_2(-e^x)\,dx+\int \mathrm{Li}_2(e^x)\,dx\\
&= x^2\tanh^{-1}\left(e^x\right)+x\mathrm{Li}_2(-e^x)-x\mathrm{Li}_2(e^x)-\mathrm{Subst}\left(\int \frac{\mathrm{Li}_2(-x)}{x}\,dx,x,e^x\right)+\mathrm{Subst}\left(\int \frac{\mathrm{Li}_2(x)}{x}\,d\right.\\
&= x^2\tanh^{-1}\left(e^x\right)+x\mathrm{Li}_2(-e^x)-x\mathrm{Li}_2(e^x)-\mathrm{Li}_3(-e^x)+\mathrm{Li}_3(e^x)
\end{aligned}
$$

Mathematica [A]
time = 0.08, size = 60, normalized size = 1.50

$$-\frac{1}{2}x^2\log\left(1-e^x\right)+\frac{1}{2}x^2\log\left(1+e^x\right)+x\mathrm{Li}_2(-e^x)-x\mathrm{Li}_2(e^x)-\mathrm{Li}_3(-e^x)+\mathrm{Li}_3(e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^x*x^2)/(1 - E^(2*x)),x]
```

```
[Out] -1/2*(x^2*Log[1 - E^x]) + (x^2*Log[1 + E^x])/2 + x*PolyLog[2, -E^x] - x*Pol
yLog[2, E^x] - PolyLog[3, -E^x] + PolyLog[3, E^x]
```

Maple [A]
time = 0.01, size = 51, normalized size = 1.28

method	result
default	$-\frac{x^2 \ln(1-e^x)}{2} - x \operatorname{polylog}(2, e^x) + \operatorname{polylog}(3, e^x) + \frac{x^2 \ln(1+e^x)}{2} + x \operatorname{polylog}(2, -e^x) - \operatorname{polylog}(3, -e$
risch	$-\frac{x^2 \ln(1-e^x)}{2} - x \operatorname{polylog}(2, e^x) + \operatorname{polylog}(3, e^x) + \frac{x^2 \ln(1+e^x)}{2} + x \operatorname{polylog}(2, -e^x) - \operatorname{polylog}(3, -e$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*x^2/(1-exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*x^2*ln(1-exp(x))-x*polylog(2,exp(x))+polylog(3,exp(x))+1/2*x^2*ln(1+ex
p(x))+x*polylog(2,-exp(x))-polylog(3,-exp(x))
```

Maxima [A]
time = 0.29, size = 48, normalized size = 1.20

$$\frac{1}{2}x^2 \log\left(e^x + 1\right) - \frac{1}{2}x^2 \log\left(-e^x + 1\right) + x\mathrm{Li}_2(-e^x) - x\mathrm{Li}_2(e^x) - \mathrm{Li}_3(-e^x) + \mathrm{Li}_3(e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x^2/(1-exp(2*x)),x, algorithm="maxima")
```

```
[Out] 1/2*x^2*log(e^x + 1) - 1/2*x^2*log(-e^x + 1) + x*dilog(-e^x) - x*dilog(e^x)
 - polylog(3, -e^x) + polylog(3, e^x)
```

Fricas [A]
time = 0.39, size = 48, normalized size = 1.20

$$\frac{1}{2}x^2 \log\left(e^x + 1\right) - \frac{1}{2}x^2 \log\left(-e^x + 1\right) + x\mathrm{Li}_2(-e^x) - x\mathrm{Li}_2(e^x) - \mathrm{polylog}(3, -e^x) + \mathrm{polylog}(3, e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x^2/(1-exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/2*x^2*log(e^x + 1) - 1/2*x^2*log(-e^x + 1) + x*dilog(-e^x) - x*dilog(e^x)
 - polylog(3, -e^x) + polylog(3, e^x)
```

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

$$-\int \frac{x^2 e^x}{e^{2x} - 1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x**2/(1-exp(2*x)),x)
```

```
[Out] -Integral(x**2*exp(x)/(exp(2*x) - 1), x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x^2/(1-exp(2*x)),x, algorithm="giac")
```

```
[Out] integrate(-x^2*e^x/(e^(2*x) - 1), x)
```

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

$$-\int \frac{x^2\,e^x}{e^{2\,x}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(x^2*exp(x))/(exp(2*x) - 1),x)
```

```
[Out] -int((x^2*exp(x))/(exp(2*x) - 1), x)
```

3.42 $\int \frac{e^x x^3}{1-e^{2x}} dx$

Optimal. Leaf size=69

$$x^3 \tanh^{-1}(e^x) + \frac{3}{2}x^2\text{Li}_2(-e^x) - \frac{3}{2}x^2\text{Li}_2(e^x) - 3x\text{Li}_3(-e^x) + 3x\text{Li}_3(e^x) + 3\text{Li}_4(-e^x) - 3\text{Li}_4(e^x)$$

```
[Out] x^3*arctanh(exp(x))+3/2*x^2*polylog(2,-exp(x))-3/2*x^2*polylog(2,exp(x))-3*
x*polylog(3,-exp(x))+3*x*polylog(3,exp(x))+3*polylog(4,-exp(x))-3*polylog(4
,exp(x))
```

Rubi [A]
time = 0.09, antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.444$, Rules used = {2281, 212, 2277, 6348, 2611, 6744, 2320, 6724}

$$\frac{3}{2}x^2\text{PolyLog}(2, -e^x) - \frac{3}{2}x^2\text{PolyLog}(2, e^x) - 3x\text{PolyLog}(3, -e^x) + 3x\text{PolyLog}(3, e^x) + 3\text{PolyLog}(4, -e^x) - 3\text{PolyLog}(4, e^x) + x^3\tanh^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Int[(E^x*x^3)/(1 - E^(2*x)),x]
```

```
[Out] x^3*ArcTanh[E^x] + (3*x^2*PolyLog[2, -E^x])/2 - (3*x^2*PolyLog[2, E^x])/2 -
 3*x*PolyLog[3, -E^x] + 3*x*PolyLog[3, E^x] + 3*PolyLog[4, -E^x] - 3*PolyLo
g[4, E^x]
```

Rule 212

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

Rule 2277

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 6348

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

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6744

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Dist[f*(m/(b*c*p*Log[F])), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{e^x x^3}{1-e^{2x}}\,dx = x^3\tanh^{-1}(e^x) - 3\int x^2\tanh^{-1}(e^x)\,dx$$
$$= x^3\tanh^{-1}(e^x) + \frac{3}{2}\int x^2\log(1-e^x)\,dx - \frac{3}{2}\int x^2\log(1+e^x)\,dx$$
$$= x^3\tanh^{-1}(e^x) + \frac{3}{2}x^2\text{Li}_2(-e^x) - \frac{3}{2}x^2\text{Li}_2(e^x) - 3\int x\text{Li}_2(-e^x)\,dx + 3\int x\text{Li}_2(e^x)\,dx$$
$$= x^3\tanh^{-1}(e^x) + \frac{3}{2}x^2\text{Li}_2(-e^x) - \frac{3}{2}x^2\text{Li}_2(e^x) - 3x\text{Li}_3(-e^x) + 3x\text{Li}_3(e^x) + 3\int \text{Li}_3(-e^x)\,dx$$
$$= x^3\tanh^{-1}(e^x) + \frac{3}{2}x^2\text{Li}_2(-e^x) - \frac{3}{2}x^2\text{Li}_2(e^x) - 3x\text{Li}_3(-e^x) + 3x\text{Li}_3(e^x) + 3\text{Subst}\left(\int \frac{\text{Li}_3(-}{x}\right.$$
$$= x^3\tanh^{-1}(e^x) + \frac{3}{2}x^2\text{Li}_2(-e^x) - \frac{3}{2}x^2\text{Li}_2(e^x) - 3x\text{Li}_3(-e^x) + 3x\text{Li}_3(e^x) + 3\text{Li}_4(-e^x) - 3\text{Li}_4$$

Mathematica [A]
time = 0.08, size = 84, normalized size = 1.22

$$\frac{1}{2}\left(-x^3\log(1-e^x) + x^3\log(1+e^x) + 3x^2\text{Li}_2(-e^x) - 3x^2\text{Li}_2(e^x) - 6x\text{Li}_3(-e^x) + 6x\text{Li}_3(e^x) + 6\text{Li}_4(-e^x) - 6\text{Li}_4(e^x)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^x*x^3)/(1 - E^(2*x)),x]
```

```
[Out] (-(x^3*Log[1 - E^x]) + x^3*Log[1 + E^x] + 3*x^2*PolyLog[2, -E^x] - 3*x^2*Po
lyLog[2, E^x] - 6*x*PolyLog[3, -E^x] + 6*x*PolyLog[3, E^x] + 6*PolyLog[4, -
E^x] - 6*PolyLog[4, E^x])/2
```

Maple [A]
time = 0.02, size = 74, normalized size = 1.07

method	result
default	$-\frac{x^3\ln(1-e^x)}{2} - \frac{3x^2\,\text{polylog}(2,e^x)}{2} + 3x\,\text{polylog}(3,e^x) - 3\,\text{polylog}(4,e^x) + \frac{x^3\ln(1+e^x)}{2} + \frac{3x^2\,\text{polylog}(2,-e^x)}{2}$
risch	$-\frac{x^3\ln(1-e^x)}{2} - \frac{3x^2\,\text{polylog}(2,e^x)}{2} + 3x\,\text{polylog}(3,e^x) - 3\,\text{polylog}(4,e^x) + \frac{x^3\ln(1+e^x)}{2} + \frac{3x^2\,\text{polylog}(2,-e^x)}{2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*x^3/(1-exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*x^3*ln(1-exp(x))-3/2*x^2*polylog(2,exp(x))+3*x*polylog(3,exp(x))-3*pol
ylog(4,exp(x))+1/2*x^3*ln(1+exp(x))+3/2*x^2*polylog(2,-exp(x))-3*x*polylog(
3,-exp(x))+3*polylog(4,-exp(x))
```

Maxima [A]
time = 0.28, size = 71, normalized size = 1.03

$$\frac{1}{2}x^3\log(e^x+1) - \frac{1}{2}x^3\log(-e^x+1) + \frac{3}{2}x^2\text{Li}_2(-e^x) - \frac{3}{2}x^2\text{Li}_2(e^x) - 3\,x\text{Li}_3(-e^x) + 3\,x\text{Li}_3(e^x) + 3\,\text{Li}_4(-e^x) - 3\,\text{Li}_4(e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x^3/(1-exp(2*x)),x, algorithm="maxima")
```

```
[Out] 1/2*x^3*log(e^x + 1) - 1/2*x^3*log(-e^x + 1) + 3/2*x^2*dilog(-e^x) - 3/2*x^
2*dilog(e^x) - 3*x*polylog(3, -e^x) + 3*x*polylog(3, e^x) + 3*polylog(4, -e
^x) - 3*polylog(4, e^x)
```

Fricas [A]
time = 0.36, size = 71, normalized size = 1.03

$$\frac{1}{2}x^3\log\left(e^x+1\right)-\frac{1}{2}x^3\log\left(-e^x+1\right)+\frac{3}{2}x^2\mathrm{Li}_2(-e^x)-\frac{3}{2}x^2\mathrm{Li}_2(e^x)-3\,x\mathrm{polylog}(3,-e^x)+3\,x\mathrm{polylog}(3,e^x)+3\,\mathrm{polylog}(4,-e^x)-3\,\mathrm{polylog}(4,e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x^3/(1-exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/2*x^3*log(e^x + 1) - 1/2*x^3*log(-e^x + 1) + 3/2*x^2*dilog(-e^x) - 3/2*x^
2*dilog(e^x) - 3*x*polylog(3, -e^x) + 3*x*polylog(3, e^x) + 3*polylog(4, -e
^x) - 3*polylog(4, e^x)
```

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

$$-\int\frac{x^3e^x}{e^{2x}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x**3/(1-exp(2*x)),x)
```

```
[Out] -Integral(x**3*exp(x)/(exp(2*x) - 1), x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x^3/(1-exp(2*x)),x, algorithm="giac")
```

```
[Out] integrate(-x^3*e^x/(e^(2*x) - 1), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$-\int\frac{x^3\,\mathrm{e}^x}{\mathrm{e}^{2\,x}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(x^3*exp(x))/(exp(2*x) - 1),x)
```

```
[Out] -int((x^3*exp(x))/(exp(2*x) - 1), x)
```

3.43 $\int \frac{f^x}{a+bf^{2x}}\,dx$

Optimal. Leaf size=30

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}$$

```
[Out] arctan(f^x*b^(1/2)/a^(1/2))/ln(f)/a^(1/2)/b^(1/2)
```

Rubi [A]
time = 0.02, antiderivative size = 30, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {2281, 211}

$$\frac{\text{ArcTan}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^x/(a + b*f^(2*x)),x]
```

```
[Out] ArcTan[(Sqrt[b]*f^x)/Sqrt[a]]/(Sqrt[a]*Sqrt[b]*Log[f])
```

Rule 211

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

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{f^x}{a+bf^{2x}}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{a+bx^2}\,dx, x, f^x\right)}{\log(f)}\\ &= \frac{\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}\end{aligned}$$

Mathematica [A]
time = 0.03, size = 30, normalized size = 1.00

$$\frac{\tan^{-1}\left(\frac{\sqrt{b} f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^x/(a + b*f^(2*x)),x]
```

```
[Out] ArcTan[(Sqrt[b]*f^x)/Sqrt[a]]/(Sqrt[a]*Sqrt[b]*Log[f])
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 52 vs. 2(22) = 44.
time = 0.03, size = 53, normalized size = 1.77

method	result	size
risch	$-\frac{\ln\left(f^{x}-\frac{a}{\sqrt{-ba}}\right)}{2\sqrt{-ba}\,\ln(f)}+\frac{\ln\left(f^{x}+\frac{a}{\sqrt{-ba}}\right)}{2\sqrt{-ba}\,\ln(f)}$	53

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x/(a+b*f^(2*x)),x,method=_RETURNVERBOSE)
```

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

Maxima [A]
time = 0.48, size = 21, normalized size = 0.70

$$\frac{\arctan\left(\frac{bf^{x}}{\sqrt{ab}}\right)}{\sqrt{ab}\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] arctan(b*f^x/sqrt(a*b))/(sqrt(a*b)*log(f))
```

Fricas [A]
time = 0.43, size = 86, normalized size = 2.87

$$\left[-\frac{\sqrt{-ab}\log\left(\frac{bf^{2x}-2\sqrt{-ab}\,f^{x}-a}{bf^{2x}+a}\right)}{2\,ab\log(f)},\ -\frac{\sqrt{ab}\arctan\left(\frac{\sqrt{ab}}{bf^{x}}\right)}{ab\log(f)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A]
time = 0.08, size = 24, normalized size = 0.80

$$\frac{\operatorname{RootSum}\left(4z^2ab+1,\left(i\mapsto i\log\left(2ia+f^x\right)\right)\right)}{\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**x/(a+b*f**(2*x)),x)
```

```
[Out] RootSum(4*_z**2*a*b + 1, Lambda(_i, _i*log(2*_i*a + f**x)))/log(f)
```

Giac [A]
time = 2.57, size = 21, normalized size = 0.70

$$\frac{\arctan\left(\frac{bf^x}{\sqrt{ab}}\right)}{\sqrt{ab}\,\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] arctan(b*f^x/sqrt(a*b))/(sqrt(a*b)*log(f))
```

Mupad [B]
time = 3.50, size = 21, normalized size = 0.70

$$\frac{\operatorname{atan}\left(\frac{b\,f^x}{\sqrt{a\,b}}\right)}{\ln\left(f\right)\,\sqrt{a\,b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x/(a + b*f^(2*x)),x)
```

```
[Out] atan((b*f^x)/(a*b)^(1/2))/(log(f)*(a*b)^(1/2))
```

3.44 $\int \frac{f^x x}{a+bf^{2x}} dx$

Optimal. Leaf size=110

$$\frac{x \tan^{-1}\left(\frac{\sqrt{b} f^x}{\sqrt{a}}\right)}{\sqrt{a} \sqrt{b} \log(f)} - \frac{i\text{Li}_2\left(-\frac{i\sqrt{b} f^x}{\sqrt{a}}\right)}{2\sqrt{a} \sqrt{b} \log^2(f)} + \frac{i\text{Li}_2\left(\frac{i\sqrt{b} f^x}{\sqrt{a}}\right)}{2\sqrt{a} \sqrt{b} \log^2(f)}$$

```
[Out] x*arctan(f^x*b^(1/2)/a^(1/2))/ln(f)/a^(1/2)/b^(1/2)-1/2*I*polylog(2,-I*f^x*
b^(1/2)/a^(1/2))/ln(f)^2/a^(1/2)/b^(1/2)+1/2*I*polylog(2,I*f^x*b^(1/2)/a^(1
/2))/ln(f)^2/a^(1/2)/b^(1/2)
```

Rubi [A]
time = 0.08, antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 7, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.438$, Rules used = {2281, 211, 2277, 12, 2320, 4940, 2438}

$$-\frac{i\text{PolyLog}\left(2,-\frac{i\sqrt{b} f^x}{\sqrt{a}}\right)}{2\sqrt{a} \sqrt{b} \log^2(f)} + \frac{i\text{PolyLog}\left(2,\frac{i\sqrt{b} f^x}{\sqrt{a}}\right)}{2\sqrt{a} \sqrt{b} \log^2(f)} + \frac{x\text{ArcTan}\left(\frac{\sqrt{b} f^x}{\sqrt{a}}\right)}{\sqrt{a} \sqrt{b} \log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[(f^x*x)/(a + b*f^(2*x)),x]
```

```
[Out] (x*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]) - ((I/2)*PolyLog
[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]^2) + ((I/2)*PolyLo
g[2, (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

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

Rule 2277

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

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

Rule 4940

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

Rubi steps

$$\begin{aligned}\int \frac{f^x x}{a+bf^{2x}}\,dx &= \frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \int \frac{\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}\,dx\\
&= \frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{\int \tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)dx}{\sqrt{a}\,\sqrt{b}\,\log(f)}\\
&= \frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{\mathrm{Subst}\left(\int \frac{\tan^{-1}\left(\frac{\sqrt{b}\,x}{\sqrt{a}}\right)}{x}\,dx, x, f^x\right)}{\sqrt{a}\,\sqrt{b}\,\log^2(f)}\\
&= \frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{i\mathrm{Subst}\left(\int \frac{\log\left(1-\frac{i\sqrt{b}\,x}{\sqrt{a}}\right)}{x}\,dx, x, f^x\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{i\mathrm{Subst}\left(\int \frac{\log\left(1+\frac{i\sqrt{b}\,x}{\sqrt{a}}\right)}{x}\,dx, x, f\right.}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)}\\
&= \frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{i\mathrm{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{i\mathrm{Li}_2\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)}\end{aligned}$$

Mathematica [A]
time = 0.07, size = 108, normalized size = 0.98

$$\frac{i\left(x\log(f)\left(\log\left(1-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)-\log\left(1+\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)\right)-\mathrm{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)+\mathrm{Li}_2\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f^x*x)/(a + b*f^(2*x)),x]
```

```
[Out] ((I/2)*(x*Log[f]*(Log[1 - (I*Sqrt[b]*f^x)/Sqrt[a]] - Log[1 + (I*Sqrt[b]*f^x
)/Sqrt[a]]) - PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]] + PolyLog[2, (I*Sqrt[b
]*f^x)/Sqrt[a]]))/(Sqrt[a]*Sqrt[b]*Log[f]^2)
```

Maple [A]
time = 0.04, size = 134, normalized size = 1.22

method	result	size

risch	$\frac{x\ln\left(\frac{-b f^{x}+\sqrt{-ba}}{\sqrt{-ba}}\right)}{2\ln(f)\sqrt{-ba}}-\frac{x\ln\left(\frac{b f^{x}+\sqrt{-ba}}{\sqrt{-ba}}\right)}{2\ln(f)\sqrt{-ba}}+\frac{\operatorname{dilog}\left(\frac{-b f^{x}+\sqrt{-ba}}{\sqrt{-ba}}\right)}{2\ln(f)^{2}\sqrt{-ba}}-\frac{\operatorname{dilog}\left(\frac{b f^{x}+\sqrt{-ba}}{\sqrt{-ba}}\right)}{2\ln(f)^{2}\sqrt{-ba}}$	134

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x*x/(a+b*f^(2*x)),x,method=_RETURNVERBOSE)
```

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

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^x*x/(b*f^(2*x) + a), x)
```

Fricas [A]
time = 0.36, size = 112, normalized size = 1.02

$$-\frac{x\sqrt{-\frac{b}{a}}\log\left(f^{x}\sqrt{-\frac{b}{a}}+1\right)\log\left(f\right)-x\sqrt{-\frac{b}{a}}\log\left(-f^{x}\sqrt{-\frac{b}{a}}+1\right)\log\left(f\right)-\sqrt{-\frac{b}{a}}\,\mathrm{Li}_{2}\left(f^{x}\sqrt{-\frac{b}{a}}\right)+\sqrt{-\frac{b}{a}}\,\mathrm{Li}_{2}\left(-f^{x}\sqrt{-\frac{b}{a}}\right)}{2\,b\log\left(f\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*(x*sqrt(-b/a)*log(f^x*sqrt(-b/a) + 1)*log(f) - x*sqrt(-b/a)*log(-f^x*s
qrt(-b/a) + 1)*log(f) - sqrt(-b/a)*dilog(f^x*sqrt(-b/a)) + sqrt(-b/a)*dilog
(-f^x*sqrt(-b/a)))/(b*log(f)^2)
```

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

$$\int\frac{f^{x}x}{a+bf^{2x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**x*x/(a+b*f**(2*x)),x)
```

```
[Out] Integral(f**x*x/(a + b*f**(2*x)), x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^x*x/(b*f^(2*x) + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{f^x\,x}{a+b\,f^{2\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f^x*x)/(a + b*f^(2*x)),x)
```

```
[Out] int((f^x*x)/(a + b*f^(2*x)), x)
```

3.45 $\int \frac{f^x x^2}{a+bf^{2x}}\,dx$

Optimal. Leaf size=184

$$\frac{x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}-\frac{ix\text{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^2(f)}+\frac{ix\text{Li}_2\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^2(f)}+\frac{i\text{Li}_3\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)}-\frac{i\text{Li}_3\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)}$$

```
[Out] x^2*arctan(f^x*b^(1/2)/a^(1/2))/ln(f)/a^(1/2)/b^(1/2)-I*x*polylog(2,-I*f^x*
b^(1/2)/a^(1/2))/ln(f)^2/a^(1/2)/b^(1/2)+I*x*polylog(2,I*f^x*b^(1/2)/a^(1/2
))/ln(f)^2/a^(1/2)/b^(1/2)+I*polylog(3,-I*f^x*b^(1/2)/a^(1/2))/ln(f)^3/a^(1
/2)/b^(1/2)-I*polylog(3,I*f^x*b^(1/2)/a^(1/2))/ln(f)^3/a^(1/2)/b^(1/2)
```

Rubi [A]
time = 0.13, antiderivative size = 184, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.444$, Rules used = {2281, 211, 2277, 12, 5251, 2611, 2320, 6724}

$$\frac{i\text{PolyLog}\left(3,-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)}-\frac{i\text{PolyLog}\left(3,\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)}-\frac{ix\text{PolyLog}\left(2,-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^2(f)}+\frac{ix\text{PolyLog}\left(2,\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^2(f)}+\frac{x^2\text{ArcTan}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[(f^x*x^2)/(a + b*f^(2*x)),x]
```

```
[Out] (x^2*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]) - (I*x*PolyLog
[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]^2) + (I*x*PolyLog[
2, (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]^2) + (I*PolyLog[3, ((-
I)*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]^3) - (I*PolyLog[3, (I*Sqr
t[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

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

Rule 2277

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
```

```
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 5251

```
Int[ArcTan[(a_.) + (b_.)*(f_)^((c_.) + (d_.)*(x_))]*(x_)^(m_.), x_Symbol] :
> Dist[I/2, Int[x^m*Log[1 - I*a - I*b*f^(c + d*x)], x], x] - Dist[I/2, Int[
x^m*Log[1 + I*a + I*b*f^(c + d*x)], x], x] /; FreeQ[{a, b, c, d, f}, x] &&
IntegerQ[m] && m > 0
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{f^x x^2}{a+bf^{2x}}\,dx = \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - 2\int \frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}\,dx$$

$$= \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{2\int x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)dx}{\sqrt{a}\,\sqrt{b}\,\log(f)}$$

$$= \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{i\int x\log\left(1-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)dx}{\sqrt{a}\,\sqrt{b}\,\log(f)} + \frac{i\int x\log\left(1+\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)dx}{\sqrt{a}\,\sqrt{b}\,\log(f)}$$

$$= \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{ix\text{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{ix\text{Li}_2\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{i\int\text{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)dx}{\sqrt{a}\,\sqrt{b}\,\log^2(f)} - \frac{i\ldots}{\ldots}$$

$$= \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{ix\text{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{ix\text{Li}_2\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{i\text{Subst}\left(\int\frac{\text{Li}_2\left(-\frac{i\sqrt{b}\,x}{\sqrt{a}}\right)}{x}dx \ldots\right.}{\sqrt{a}\,\sqrt{b}\,\log^3(f)}$$

$$= \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{ix\text{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{ix\text{Li}_2\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{i\text{Li}_3\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)} - \frac{i\text{Li}_3\left(\ldots\right.}{\sqrt{a}\,\sqrt{b}\ldots}$$

Mathematica [A]
time = 0.06, size = 168, normalized size = 0.91

$$\frac{i\left(x^2\log^2(f)\log\left(1-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)-x^2\log^2(f)\log\left(1+\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)-2x\log(f)\text{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)+2x\log(f)\text{Li}_2\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)+2\text{Li}_3\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)-2\text{Li}_3\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)\right)}{2\sqrt{a}\,\sqrt{b}\,\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f^x*x^2)/(a + b*f^(2*x)),x]
```

```
[Out] ((I/2)*(x^2*Log[f]^2*Log[1 - (I*Sqrt[b]*f^x)/Sqrt[a]] - x^2*Log[f]^2*Log[1
+ (I*Sqrt[b]*f^x)/Sqrt[a]] - 2*x*Log[f]*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[
a]] + 2*x*Log[f]*PolyLog[2, (I*Sqrt[b]*f^x)/Sqrt[a]] + 2*PolyLog[3, ((-I)*S
qrt[b]*f^x)/Sqrt[a]] - 2*PolyLog[3, (I*Sqrt[b]*f^x)/Sqrt[a]]))/(Sqrt[a]*Sqr
t[b]*Log[f]^3)
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{f^x x^2}{a+b\,f^{2x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x*x^2/(a+b*f^(2*x)),x)
```

```
[Out] int(f^x*x^2/(a+b*f^(2*x)),x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^x*x^2/(b*f^(2*x) + a), x)
```

Fricas [A]
time = 0.36, size = 176, normalized size = 0.96

$$-\frac{x^2\sqrt{-\frac{b}{a}}\log\left(f^x\sqrt{-\frac{b}{a}}+1\right)\log(f)^2 - x^2\sqrt{-\frac{b}{a}}\log\left(-f^x\sqrt{-\frac{b}{a}}+1\right)\log(f)^2 - 2x\sqrt{-\frac{b}{a}}\,\mathrm{Li}_2\left(f^x\sqrt{-\frac{b}{a}}\right)\log(f) + 2x\sqrt{-\frac{b}{a}}\,\mathrm{Li}_2\left(-f^x\sqrt{-\frac{b}{a}}\right)\log(f) + 2\sqrt{-\frac{b}{a}}\,\mathrm{polylog}\left(3, f^x\sqrt{-\frac{b}{a}}\right) - 2\sqrt{-\frac{b}{a}}\,\mathrm{polylog}\left(3, -f^x\sqrt{-\frac{b}{a}}\right)}{2b\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*(x^2*sqrt(-b/a)*log(f^x*sqrt(-b/a) + 1)*log(f)^2 - x^2*sqrt(-b/a)*log(
-f^x*sqrt(-b/a) + 1)*log(f)^2 - 2*x*sqrt(-b/a)*dilog(f^x*sqrt(-b/a))*log(f)
 + 2*x*sqrt(-b/a)*dilog(-f^x*sqrt(-b/a))*log(f) + 2*sqrt(-b/a)*polylog(3, f
^x*sqrt(-b/a)) - 2*sqrt(-b/a)*polylog(3, -f^x*sqrt(-b/a)))/(b*log(f)^3)
```

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

$$\int \frac{f^x x^2}{a + bf^{2x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**x*x**2/(a+b*f**(2*x)),x)
```

```
[Out] Integral(f**x*x**2/(a + b*f**(2*x)), x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^x*x^2/(b*f^(2*x) + a), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{f^x\,x^2}{a+b\,f^{2\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f^x*x^2)/(a + b*f^(2*x)),x)
[Out] int((f^x*x^2)/(a + b*f^(2*x)), x)
```

3.46 $\int \frac{f^x x^3}{a+bf^{2x}} \, dx$

Optimal. Leaf size=268

$$\frac{x^3 \tan^{-1}\left(\frac{\sqrt{b}\, f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{3ix^2 \text{Li}_2\left(-\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{3ix^2 \text{Li}_2\left(\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{3ix \text{Li}_3\left(-\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)} - \frac{3ix \text{Li}_3\left(\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)} - \frac{3i\text{Li}_4}{\sqrt{a}}$$

```
[Out] x^3*arctan(f^x*b^(1/2)/a^(1/2))/ln(f)/a^(1/2)/b^(1/2)-3/2*I*x^2*polylog(2,-
I*f^x*b^(1/2)/a^(1/2))/ln(f)^2/a^(1/2)/b^(1/2)+3/2*I*x^2*polylog(2,I*f^x*b^
(1/2)/a^(1/2))/ln(f)^2/a^(1/2)/b^(1/2)+3*I*x*polylog(3,-I*f^x*b^(1/2)/a^(1/
2))/ln(f)^3/a^(1/2)/b^(1/2)-3*I*x*polylog(3,I*f^x*b^(1/2)/a^(1/2))/ln(f)^3/
a^(1/2)/b^(1/2)-3*I*polylog(4,-I*f^x*b^(1/2)/a^(1/2))/ln(f)^4/a^(1/2)/b^(1/
2)+3*I*polylog(4,I*f^x*b^(1/2)/a^(1/2))/ln(f)^4/a^(1/2)/b^(1/2)
```

Rubi [A]
time = 0.17, antiderivative size = 268, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 9, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {2281, 211, 2277, 12, 5251, 2611, 6744, 2320, 6724}

$$-\frac{3ix^2 \text{PolyLog}\left(2,-\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{3ix^2 \text{PolyLog}\left(2,\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)} - \frac{3i \text{PolyLog}\left(4,-\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^4(f)} + \frac{3i \text{PolyLog}\left(4,\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^4(f)} + \frac{3ix \text{PolyLog}\left(3,-\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)} - \frac{3ix \text{PolyLog}\left(3,\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)} + \frac{x^3 \text{ArcTan}\left(\frac{\sqrt{b}\, f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[(f^x*x^3)/(a + b*f^(2*x)),x]
```

```
[Out] (x^3*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]) - (((3*I)/2)*x
^2*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]^2) + (((
3*I)/2)*x^2*PolyLog[2, (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]^2)
 + ((3*I)*x*PolyLog[3, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]
^3) - ((3*I)*x*PolyLog[3, (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]
^3) - ((3*I)*PolyLog[4, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f
]^4) + ((3*I)*PolyLog[4, (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]^
4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

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

Rule 2277

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 5251

```
Int[ArcTan[(a_.) + (b_.)*(f_)^((c_.) + (d_.)*(x_))]*(x_)^(m_.), x_Symbol] :
> Dist[I/2, Int[x^m*Log[1 - I*a - I*b*f^(c + d*x)], x], x] - Dist[I/2, Int[
x^m*Log[1 + I*a + I*b*f^(c + d*x)], x], x] /; FreeQ[{a, b, c, d, f}, x] &&
IntegerQ[m] && m > 0
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6744

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
```

```
+ b*x)))^p]/(b*c*p*Log[F])), x] - Dist[f*(m/(b*c*p*Log[F])), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{f^x x^3}{a+bf^{2x}}\,dx = \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - 3\int \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}\,dx$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{3\int x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)\,dx}{\sqrt{a}\,\sqrt{b}\,\log(f)}$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{(3i)\int x^2\log\left(1-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)\,dx}{2\sqrt{a}\,\sqrt{b}\,\log(f)} + \frac{(3i)\int x^2\log\left(1+\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)\,dx}{2\sqrt{a}\,\sqrt{b}\,\log(f)}$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{3ix^2\mathrm{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{3ix^2\mathrm{Li}_2\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \cdots$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{3ix^2\mathrm{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{3ix^2\mathrm{Li}_2\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{3ix\mathrm{Li}_3\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)} - \cdots$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{3ix^2\mathrm{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{3ix^2\mathrm{Li}_2\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{3ix\mathrm{Li}_3\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)} - \cdots$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{3ix^2\mathrm{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{3ix^2\mathrm{Li}_2\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{3ix\mathrm{Li}_3\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)} - \cdots$$

Mathematica [A]
time = 0.06, size = 224, normalized size = 0.84

$$\frac{i\left(x^3\log^3(f)\log\left(1-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)-x^3\log^3(f)\log\left(1+\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)-3x^2\log^2(f)\mathrm{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)+3x^2\log^2(f)\mathrm{Li}_2\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)+6x\log(f)\mathrm{Li}_3\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)-6x\log(f)\mathrm{Li}_3\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)-6\mathrm{Li}_4\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)+6\mathrm{Li}_4\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)\right)}{2\sqrt{a}\,\sqrt{b}\,\log^4(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f^x*x^3)/(a + b*f^(2*x)),x]

[Out] ((I/2)*(x^3*Log[f]^3*Log[1 - (I*Sqrt[b]*f^x)/Sqrt[a]] - x^3*Log[f]^3*Log[1
+ (I*Sqrt[b]*f^x)/Sqrt[a]] - 3*x^2*Log[f]^2*PolyLog[2, ((-I)*Sqrt[b]*f^x)/S
```

```
qrt[a]] + 3*x^2*Log[f]^2*PolyLog[2, (I*Sqrt[b]*f^x)/Sqrt[a]] + 6*x*Log[f]*P
olyLog[3, ((-I)*Sqrt[b]*f^x)/Sqrt[a]] - 6*x*Log[f]*PolyLog[3, (I*Sqrt[b]*f^
x)/Sqrt[a]] - 6*PolyLog[4, ((-I)*Sqrt[b]*f^x)/Sqrt[a]] + 6*PolyLog[4, (I*Sq
rt[b]*f^x)/Sqrt[a]]))/(Sqrt[a]*Sqrt[b]*Log[f]^4)
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{f^{x} x^{3}}{a+b\,f^{2 x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x*x^3/(a+b*f^(2*x)),x)
```

```
[Out] int(f^x*x^3/(a+b*f^(2*x)),x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x^3/(a+b*f^(2*x)),x, algorithm="maxima")
```

```
[Out] integrate(f^x*x^3/(b*f^(2*x) + a), x)
```

Fricas [A]
time = 0.37, size = 239, normalized size = 0.89

$$-\frac{x^{3} \sqrt{-\frac{b}{a}} \log\left(f^{x} \sqrt{-\frac{b}{a}} + 1\right) \log\left(f\right)^{3} - x^{3} \sqrt{-\frac{b}{a}} \log\left(-f^{x} \sqrt{-\frac{b}{a}} + 1\right) \log\left(f\right)^{3} - 3\,x^{2} \sqrt{-\frac{b}{a}}\, {\rm Li}_2\left(f^{x} \sqrt{-\frac{b}{a}}\right) \log\left(f\right)^{2} + 3\,x^{2} \sqrt{-\frac{b}{a}}\, {\rm Li}_2\left(-f^{x} \sqrt{-\frac{b}{a}}\right) \log\left(f\right)^{2} + 6\,x \sqrt{-\frac{b}{a}} \log\left(f\right) {\rm polylog}\left(3, f^{x} \sqrt{-\frac{b}{a}}\right) - 6\,x \sqrt{-\frac{b}{a}} \log\left(f\right) {\rm polylog}\left(3, -f^{x} \sqrt{-\frac{b}{a}}\right) - 6 \sqrt{-\frac{b}{a}}\, {\rm polylog}\left(4, f^{x} \sqrt{-\frac{b}{a}}\right) + 6 \sqrt{-\frac{b}{a}}\, {\rm polylog}\left(4, -f^{x} \sqrt{-\frac{b}{a}}\right)}{2\,b \log\left(f\right)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x^3/(a+b*f^(2*x)),x, algorithm="fricas")
```

```
[Out] -1/2*(x^3*sqrt(-b/a)*log(f^x*sqrt(-b/a) + 1)*log(f)^3 - x^3*sqrt(-b/a)*log(
-f^x*sqrt(-b/a) + 1)*log(f)^3 - 3*x^2*sqrt(-b/a)*dilog(f^x*sqrt(-b/a))*log(
f)^2 + 3*x^2*sqrt(-b/a)*dilog(-f^x*sqrt(-b/a))*log(f)^2 + 6*x*sqrt(-b/a)*lo
g(f)*polylog(3, f^x*sqrt(-b/a)) - 6*x*sqrt(-b/a)*log(f)*polylog(3, -f^x*sqr
t(-b/a)) - 6*sqrt(-b/a)*polylog(4, f^x*sqrt(-b/a)) + 6*sqrt(-b/a)*polylog(4
, -f^x*sqrt(-b/a)))/(b*log(f)^4)
```

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

$$\int \frac{f^{x} x^{3}}{a + b f^{2 x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**x*x**3/(a+b*f**(2*x)),x)
```

```
[Out] Integral(f**x*x**3/(a + b*f**(2*x)), x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x^3/(a+b*f^(2*x)),x, algorithm="giac")
```

```
[Out] integrate(f^x*x^3/(b*f^(2*x) + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{f^x\,x^3}{a+b\,f^{2\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f^x*x^3)/(a + b*f^(2*x)),x)
```

```
[Out] int((f^x*x^3)/(a + b*f^(2*x)), x)
```

3.47 $\int \frac{f^x}{(a+bf^{2x})^2}\,dx$

Optimal. Leaf size=59

$$\frac{f^x}{2a\left(a+bf^{2x}\right)\log(f)}+\frac{\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)}$$

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

Rubi [A]
time = 0.03, antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2281, 205, 211}

$$\frac{\text{ArcTan}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)}+\frac{f^x}{2a\log(f)\left(a+bf^{2x}\right)}$$

Antiderivative was successfully verified.

```
[In] Int[f^x/(a + b*f^(2*x))^2,x]
```

```
[Out] f^x/(2*a*(a + b*f^(2*x))*Log[f]) + ArcTan[(Sqrt[b]*f^x)/Sqrt[a]]/(2*a^(3/2)
*Sqrt[b]*Log[f])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integ
erQ[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denom
inator[p + 1/n] < Denominator[p])
```

Rule 211

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

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
```

```
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{f^x}{(a+bf^{2x})^2}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{(a+bx^2)^2}\,dx, x, f^x\right)}{\log(f)}\\
&= \frac{f^x}{2a\,(a+bf^{2x})\log(f)} + \frac{\text{Subst}\left(\int \frac{1}{a+bx^2}\,dx, x, f^x\right)}{2a\log(f)}\\
&= \frac{f^x}{2a\,(a+bf^{2x})\log(f)} + \frac{\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)}
\end{aligned}$$

Mathematica [A]
time = 0.09, size = 53, normalized size = 0.90

$$\frac{\frac{f^x}{a^2+abf^{2x}} + \frac{\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{a^{3/2}\sqrt{b}}}{2\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^x/(a + b*f^(2*x))^2,x]
```

```
[Out] (f^x/(a^2 + a*b*f^(2*x)) + ArcTan[(Sqrt[b]*f^x)/Sqrt[a]]/(a^(3/2)*Sqrt[b]))
/(2*Log[f])
```

Maple [A]
time = 0.03, size = 82, normalized size = 1.39

method	result	size
risch	$\frac{f^x}{2a(a+b\,f^{2x})\ln(f)} - \frac{\ln\left(f^x - \frac{a}{\sqrt{-ba}}\right)}{4\sqrt{-ba}\;a\ln(f)} + \frac{\ln\left(f^x + \frac{a}{\sqrt{-ba}}\right)}{4\sqrt{-ba}\;a\ln(f)}$	82

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x/(a+b*f^(2*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/ln(f)/a*f^x/(a+b*(f^x)^2)-1/4/(-b*a)^(1/2)/a/ln(f)*ln(f^x-1/(-b*a)^(1/2
)*a)+1/4/(-b*a)^(1/2)/a/ln(f)*ln(f^x+1/(-b*a)^(1/2)*a)
```

Maxima [A]
time = 0.48, size = 49, normalized size = 0.83

$$\frac{f^x}{2\,(abf^{2\,x}+a^2)\log\left(f\right)}+\frac{\arctan\left(\frac{bf^x}{\sqrt{ab}}\right)}{2\,\sqrt{ab}\,a\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A]
time = 0.38, size = 164, normalized size = 2.78

$$\left[\frac{2\,abf^x-\left(\sqrt{-ab}\,bf^{2\,x}+\sqrt{-ab}\,a\right)\log\left(\frac{bf^{2\,x}-2\,\sqrt{-ab}\,f^x-a}{bf^{2\,x}+a}\right)}{4\,(a^2b^2f^{2\,x}\log\left(f\right)+a^3b\log\left(f\right))},\frac{abf^x-\left(\sqrt{ab}\,bf^{2\,x}+\sqrt{ab}\,a\right)\arctan\left(\frac{\sqrt{ab}}{bf^x}\right)}{2\,(a^2b^2f^{2\,x}\log\left(f\right)+a^3b\log\left(f\right))}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] [1/4*(2*a*b*f^x - (sqrt(-a*b)*b*f^(2*x) + sqrt(-a*b)*a)*log((b*f^(2*x) - 2*
sqrt(-a*b)*f^x - a)/(b*f^(2*x) + a)))/(a^2*b^2*f^(2*x)*log(f) + a^3*b*log(f
)), 1/2*(a*b*f^x - (sqrt(a*b)*b*f^(2*x) + sqrt(a*b)*a)*arctan(sqrt(a*b)/(b*
f^x)))/(a^2*b^2*f^(2*x)*log(f) + a^3*b*log(f))]
```

Sympy [A]
time = 0.12, size = 53, normalized size = 0.90

$$\frac{f^x}{2a^2\log\left(f\right)+2abf^{2x}\log\left(f\right)}+\frac{\operatorname{RootSum}\left(16z^2a^3b+1,\left(i\mapsto i\log\left(4ia^2+f^x\right)\right)\right)}{\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**x/(a+b*f**(2*x))**2,x)
```

```
[Out] f**x/(2*a**2*log(f) + 2*a*b*f**(2*x)*log(f)) + RootSum(16*_z**2*a**3*b + 1,
 Lambda(_i, _i*log(4*_i*a**2 + f**x)))/log(f)
```

Giac [A]
time = 2.85, size = 49, normalized size = 0.83

$$\frac{\arctan\left(\frac{bf^x}{\sqrt{ab}}\right)}{2\,\sqrt{ab}\,a\log\left(f\right)}+\frac{f^x}{2\,(bf^{2\,x}+a)a\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Mupad [B]
time = 3.50, size = 49, normalized size = 0.83

$$\frac{f^x}{2\,a\,\ln\left(f\right)\,\left(a+b\,f^{2\,x}\right)}+\frac{\mathrm{atan}\left(\frac{b\,f^x}{\sqrt{a\,b}}\right)}{2\,a\,\ln\left(f\right)\,\sqrt{a\,b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x/(a + b*f^(2*x))^2,x)
```

```
[Out] f^x/(2*a*log(f)*(a + b*f^(2*x))) + atan((b*f^x)/(a*b)^(1/2))/(2*a*log(f)*(a
*b)^(1/2))
```

3.48 $\int \frac{f^x x}{(a+bf^{2x})^2}\,dx$

Optimal. Leaf size=172

$$-\frac{\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log^2(f)}+\frac{f^x x}{2a\left(a+bf^{2x}\right)\log(f)}+\frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)}-\frac{i\text{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{4a^{3/2}\sqrt{b}\,\log^2(f)}+\frac{i\text{Li}_2\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{4a^{3/2}\sqrt{b}\,\log^2(f)}$$

```
[Out] 1/2*f^x*x/a/(a+b*f^(2*x))/ln(f)-1/2*arctan(f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(
f)^2/b^(1/2)+1/2*x*arctan(f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)/b^(1/2)-1/4*I*
polylog(2,-I*f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)^2/b^(1/2)+1/4*I*polylog(2,I
*f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)^2/b^(1/2)
```

Rubi [A]
time = 0.12, antiderivative size = 172, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.438$, Rules used = {2281, 205, 211, 2277, 2320, 4940, 2438}

$$-\frac{i\text{PolyLog}\left(2,-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{4a^{3/2}\sqrt{b}\,\log^2(f)}+\frac{i\text{PolyLog}\left(2,\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{4a^{3/2}\sqrt{b}\,\log^2(f)}-\frac{\text{ArcTan}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log^2(f)}+\frac{x\text{ArcTan}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)}+\frac{xf^x}{2a\log(f)\left(a+bf^{2x}\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(f^x*x)/(a + b*f^(2*x))^2,x]
```

```
[Out] -1/2*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]]/(a^(3/2)*Sqrt[b]*Log[f]^2) + (f^x*x)/(2*
a*(a + b*f^(2*x))*Log[f]) + (x*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(2*a^(3/2)*Sq
rt[b]*Log[f]) - ((I/4)*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(a^(3/2)*Sqr
t[b]*Log[f]^2) + ((I/4)*PolyLog[2, (I*Sqrt[b]*f^x)/Sqrt[a]])/(a^(3/2)*Sqrt[
b]*Log[f]^2)
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integ
erQ[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denom
inator[p + 1/n] < Denominator[p])
```

Rule 211

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

Rule 2277

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

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

Rule 4940

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

Rubi steps

$$\int \frac{f^x x}{(a+bf^{2x})^2}\,dx = \frac{f^x x}{2a(a+bf^{2x})\log(f)} + \frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} - \int \left(\frac{f^x}{2a(a+bf^{2x})\log(f)} + \frac{\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(\ldots}\right.$$

$$= \frac{f^x x}{2a(a+bf^{2x})\log(f)} + \frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} - \frac{\int \frac{f^x}{a+bf^{2x}}\,dx}{2a\log(f)} - \frac{\int \tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)dx}{2a^{3/2}\sqrt{b}\,\log(f)}$$

$$= \frac{f^x x}{2a(a+bf^{2x})\log(f)} + \frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} - \frac{\text{Subst}\left(\int \frac{1}{a+bx^2}\,dx, x, f^x\right)}{2a\log^2(f)} - \frac{\text{Subst}\left(\int \frac{\tan^{-1}\ldots}{\ldots}\right.}{2a^{3/2}\ldots}$$

$$= -\frac{\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log^2(f)} + \frac{f^x x}{2a(a+bf^{2x})\log(f)} + \frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} - \frac{i\text{Subst}\left(\int \frac{\log\left(1-\frac{i\sqrt{b}\ldots}{\sqrt{a}}\right)}{x}\right.}{4a^{3/2}\sqrt{b}\,\log\ldots}$$

$$= -\frac{\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log^2(f)} + \frac{f^x x}{2a(a+bf^{2x})\log(f)} + \frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} - \frac{i\text{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{4a^{3/2}\sqrt{b}\,\log^2(f)} + \ldots$$

Mathematica [A]
time = 0.11, size = 271, normalized size = 1.58

$$-\frac{\left(1+\frac{bf^{2x}}{a}\right)\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2\sqrt{a}\sqrt{b}\,(a+bf^{2x})\log^2(f)} + \frac{f^x x}{2a(a+bf^{2x})\log(f)} + \frac{\frac{\frac{ix^2}{2\sqrt{a}} - \frac{ix\log\left(1+\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\log(f)} - \frac{i\text{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\log^2(f)}}{2\sqrt{b}} + \frac{-\frac{ix^2}{2\sqrt{a}} + \frac{ix\log\left(1-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\log(f)} + \frac{i\text{Li}_2\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\log^2(f)}}{2\sqrt{b}}}{2a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f^x*x)/(a + b*f^(2*x))^2,x]
```

```
[Out] -1/2*((1 + (b*f^(2*x))/a)*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*(
a + b*f^(2*x))*Log[f]^2) + (f^x*x)/(2*a*(a + b*f^(2*x))*Log[f]) + ((((I/2)*
x^2)/Sqrt[a] - (I*x*Log[1 + (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Log[f]) - (I
*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Log[f]^2))/(2*Sqrt[b]) +
(((-1/2*I)*x^2)/Sqrt[a] + (I*x*Log[1 - (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*L
og[f]) + (I*PolyLog[2, (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Log[f]^2))/(2*Sqr
t[b]))/(2*a)
```

Maple [A]
time = 0.04, size = 195, normalized size = 1.13

method	result
risch	$\frac{f^{x} x}{2 a \left(a +b \,f^{2 x}\right) \ln \left(f \right)}+\frac{x \ln \left(\frac{-b \,f^{x}+\sqrt{-b a}}{\sqrt{-b a}}\right)}{4 \ln \left(f \right) a \sqrt{-b a}}-\frac{x \ln \left(\frac{b \,f^{x}+\sqrt{-b a}}{\sqrt{-b a}}\right)}{4 \ln \left(f \right) a \sqrt{-b a}}+\frac{\operatorname{dilog}\left(\frac{-b \,f^{x}+\sqrt{-b a}}{\sqrt{-b a}}\right)}{4 \ln \left(f \right)^{2} a \sqrt{-b a}}-\frac{\operatorname{dilog}\left(\frac{b \,f^{x}+\sqrt{-b a}}{\sqrt{-b a}}\right)}{4 \ln \left(f \right)^{2} a \sqrt{-b a}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x*x/(a+b*f^(2*x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/ln(f)/a*f^x*x/(a+b*(f^x)^2)+1/4/ln(f)/a*x/(-b*a)^(1/2)*ln((-b*f^x+(-b*a
)^(1/2))/(-b*a)^(1/2))-1/4/ln(f)/a*x/(-b*a)^(1/2)*ln((b*f^x+(-b*a)^(1/2))/(
-b*a)^(1/2))+1/4/ln(f)^2/a/(-b*a)^(1/2)*dilog((-b*f^x+(-b*a)^(1/2))/(-b*a)^
(1/2))-1/4/ln(f)^2/a/(-b*a)^(1/2)*dilog((b*f^x+(-b*a)^(1/2))/(-b*a)^(1/2))-
1/2/ln(f)^2/a/(b*a)^(1/2)*arctan(b*f^x/(b*a)^(1/2))
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*f^x*x/(a*b*f^(2*x)*log(f) + a^2*log(f)) + integrate(1/2*(x*log(f) - 1)*
f^x/(a*b*f^(2*x)*log(f) + a^2*log(f)), x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 311 vs. 2(120) = 240.
time = 0.38, size = 311, normalized size = 1.81

$$\frac{2 \, b f^{x} x \log\left(f\right) + \left(b f^{2 \, x} \sqrt{-\frac{b}{a}} + a \sqrt{-\frac{b}{a}}\right) {\rm Li}_2\left(f^{x} \sqrt{-\frac{b}{a}}\right) - \left(b f^{2 \, x} \sqrt{-\frac{b}{a}} + a \sqrt{-\frac{b}{a}}\right) {\rm Li}_2\left(-f^{x} \sqrt{-\frac{b}{a}}\right) - \left(b f^{2 \, x} \sqrt{-\frac{b}{a}} + a \sqrt{-\frac{b}{a}}\right) \log\left(2 \, b f^{x} + 2 \, a \sqrt{-\frac{b}{a}}\right) + \left(b f^{2 \, x} \sqrt{-\frac{b}{a}} + a \sqrt{-\frac{b}{a}}\right) \log\left(2 \, b f^{x} - 2 \, a \sqrt{-\frac{b}{a}}\right) - \left(b f^{2 \, x} x \sqrt{-\frac{b}{a}} \log\left(f\right) + a x \sqrt{-\frac{b}{a}} \log\left(f\right)\right) \log\left(f^{x} \sqrt{-\frac{b}{a}} + 1\right) + \left(b f^{2 \, x} x \sqrt{-\frac{b}{a}} \log\left(f\right) + a x \sqrt{-\frac{b}{a}} \log\left(f\right)\right) \log\left(-f^{x} \sqrt{-\frac{b}{a}} + 1\right)}{4 \, {\left(a b^{2} f^{2 \, x} \log\left(f\right)^{2} + a^{2} b \log\left(f\right)^{2}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*(2*b*f^x*x*log(f) + (b*f^(2*x)*sqrt(-b/a) + a*sqrt(-b/a))*dilog(f^x*sqr
t(-b/a)) - (b*f^(2*x)*sqrt(-b/a) + a*sqrt(-b/a))*dilog(-f^x*sqrt(-b/a)) - (
b*f^(2*x)*sqrt(-b/a) + a*sqrt(-b/a))*log(2*b*f^x + 2*a*sqrt(-b/a)) + (b*f^(
2*x)*sqrt(-b/a) + a*sqrt(-b/a))*log(2*b*f^x - 2*a*sqrt(-b/a)) - (b*f^(2*x)*
x*sqrt(-b/a)*log(f) + a*x*sqrt(-b/a)*log(f))*log(f^x*sqrt(-b/a) + 1) + (b*f
^(2*x)*x*sqrt(-b/a)*log(f) + a*x*sqrt(-b/a)*log(f))*log(-f^x*sqrt(-b/a) + 1
))/(a*b^2*f^(2*x)*log(f)^2 + a^2*b*log(f)^2)
```

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

$$\frac{f^{x} x}{2 a^{2} \log{\left(f \right)} + 2 a b f^{2 x} \log{\left(f \right)}} + \frac{\int \left(- \frac{f^{x}}{a + b f^{2 x}}\right)\, dx + \int \frac{f^{x} x \log{\left(f \right)}}{a + b f^{2 x}}\, dx}{2 a \log{\left(f \right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**x*x/(a+b*f**(2*x))**2,x)
```

```
[Out] f**x*x/(2*a**2*log(f) + 2*a*b*f**(2*x)*log(f)) + (Integral(-f**x/(a + b*f**
(2*x)), x) + Integral(f**x*x*log(f)/(a + b*f**(2*x)), x))/(2*a*log(f))
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^x*x/(b*f^(2*x) + a)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{f^x\,x}{{\left(a+b\,f^{2\,x}\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f^x*x)/(a + b*f^(2*x))^2,x)
```

```
[Out] int((f^x*x)/(a + b*f^(2*x))^2, x)
```

3.49 $\int \frac{f^x x^2}{\left(a+bf^{2x}\right)^2} \, dx$

Optimal. Leaf size=333

$$-\frac{x \tan^{-1}\left(\frac{\sqrt{b}\, f^x}{\sqrt{a}}\right)}{a^{3/2}\sqrt{b}\,\log^2(f)}+\frac{f^x x^2}{2a\left(a+bf^{2x}\right)\log(f)}+\frac{x^2\tan^{-1}\left(\frac{\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)}+\frac{i\text{Li}_2\left(-\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log^3(f)}-\frac{ix\text{Li}_2\left(-\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log^2(f)}-\frac{i\text{Li}_2}{2a^{3/2}}$$

```
[Out] 1/2*f^x*x^2/a/(a+b*f^(2*x))/ln(f)-x*arctan(f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(
f)^2/b^(1/2)+1/2*x^2*arctan(f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)/b^(1/2)+1/2*
I*polylog(2,-I*f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)^3/b^(1/2)-1/2*I*x*polylog
(2,-I*f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)^2/b^(1/2)-1/2*I*polylog(2,I*f^x*b^
(1/2)/a^(1/2))/a^(3/2)/ln(f)^3/b^(1/2)+1/2*I*x*polylog(2,I*f^x*b^(1/2)/a^(1
/2))/a^(3/2)/ln(f)^2/b^(1/2)+1/2*I*polylog(3,-I*f^x*b^(1/2)/a^(1/2))/a^(3/2
)/ln(f)^3/b^(1/2)-1/2*I*polylog(3,I*f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)^3/b^
(1/2)
```

Rubi [A]
time = 0.27, antiderivative size = 333, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 12, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.667$, Rules used = {2281, 205, 211, 2277, 14, 12, 2320, 4940, 2438, 5251, 2611, 6724}

$$\frac{i\text{PolyLog}\left(2,-\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log^3(f)}-\frac{i\text{PolyLog}\left(2,\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log^3(f)}+\frac{i\text{PolyLog}\left(3,-\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log^3(f)}-\frac{i\text{PolyLog}\left(3,\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log^3(f)}-\frac{ix\text{PolyLog}\left(2,-\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log^2(f)}+\frac{ix\text{PolyLog}\left(2,\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log^2(f)}+\frac{x^2\text{ArcTan}\left(\frac{\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)}-\frac{x\text{ArcTan}\left(\frac{\sqrt{b}\, f^x}{\sqrt{a}}\right)}{a^{3/2}\sqrt{b}\,\log^2(f)}+\frac{x^2 f^x}{2a\log(f)\left(a+bf^{2x}\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(f^x*x^2)/(a + b*f^(2*x))^2,x]
```

```
[Out] -((x*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(a^(3/2)*Sqrt[b]*Log[f]^2)) + (f^x*x^2)
/(2*a*(a + b*f^(2*x))*Log[f]) + (x^2*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(2*a^(3
/2)*Sqrt[b]*Log[f]) + ((I/2)*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(a^(3/
2)*Sqrt[b]*Log[f]^3) - ((I/2)*x*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(a^
(3/2)*Sqrt[b]*Log[f]^2) - ((I/2)*PolyLog[2, (I*Sqrt[b]*f^x)/Sqrt[a]])/(a^(3
/2)*Sqrt[b]*Log[f]^3) + ((I/2)*x*PolyLog[2, (I*Sqrt[b]*f^x)/Sqrt[a]])/(a^(3
/2)*Sqrt[b]*Log[f]^2) + ((I/2)*PolyLog[3, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(a^(
3/2)*Sqrt[b]*Log[f]^3) - ((I/2)*PolyLog[3, (I*Sqrt[b]*f^x)/Sqrt[a]])/(a^(3/
2)*Sqrt[b]*Log[f]^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
```

```
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integ
erQ[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denom
inator[p + 1/n] < Denominator[p])
```

Rule 211

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

Rule 2277

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

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

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4940

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

Rule 5251

```
Int[ArcTan[(a_.) + (b_.)*(f_)^((c_.) + (d_.)*(x_))]*(x_)^(m_.), x_Symbol] :
> Dist[I/2, Int[x^m*Log[1 - I*a - I*b*f^(c + d*x)], x], x] - Dist[I/2, Int[
x^m*Log[1 + I*a + I*b*f^(c + d*x)], x], x] /; FreeQ[{a, b, c, d, f}, x] &&
IntegerQ[m] && m > 0
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{f^x x^2}{(a+bf^{2x})^2}\,dx = \frac{f^x x^2}{2a\,(a+bf^{2x})\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} - 2\int x\left(\frac{f^x}{2a\,(a+bf^{2x})\log(f)} + \frac{\tan^{-1}\left(\cdots\right.}{2a^{3/2}\sqrt{b}\,\cdots}\right.$$

$$= \frac{f^x x^2}{2a\,(a+bf^{2x})\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} - 2\int\left(\frac{f^x x}{2a\,(a+bf^{2x})\log(f)} + \frac{x\tan^{-1}\left(\cdots\right.}{2a^{3/2}\sqrt{b}\,\cdots}\right.$$

$$= \frac{f^x x^2}{2a\,(a+bf^{2x})\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} - \frac{\int \frac{f^x x}{a+bf^{2x}}\,dx}{a\log(f)} - \frac{\int x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)dx}{a^{3/2}\sqrt{b}\,\log(f)}$$

$$= -\frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{a^{3/2}\sqrt{b}\,\log^2(f)} + \frac{f^x x^2}{2a\,(a+bf^{2x})\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} + \frac{\int \frac{\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\,\log(f)}\,d\cdots}{a\log(f)}\cdots$$

$$= -\frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{a^{3/2}\sqrt{b}\,\log^2(f)} + \frac{f^x x^2}{2a\,(a+bf^{2x})\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} - \frac{ix\operatorname{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log^2(f)}\cdots$$

$$= -\frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{a^{3/2}\sqrt{b}\,\log^2(f)} + \frac{f^x x^2}{2a\,(a+bf^{2x})\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} - \frac{ix\operatorname{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log^2(f)}\cdots$$

$$= -\frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{a^{3/2}\sqrt{b}\,\log^2(f)} + \frac{f^x x^2}{2a\,(a+bf^{2x})\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} - \frac{ix\operatorname{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log^2(f)}\cdots$$

$$= -\frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{a^{3/2}\sqrt{b}\,\log^2(f)} + \frac{f^x x^2}{2a\,(a+bf^{2x})\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} + \frac{i\operatorname{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log^3(f)} - \cdots$$

Mathematica [A]

time = 0.11, size = 477, normalized size = 1.43

$$\frac{f^x x^2}{2a\,(a+bf^{2x})\log(f)} - \frac{\frac{\frac{ix^2}{2\sqrt{a}} - \frac{ix\log\left(1+\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\log(f)} - \frac{i\operatorname{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\log^2(f)}}{2\sqrt{b}} + \frac{-\frac{ix^2}{2\sqrt{a}} + \frac{ix\log\left(1-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\log(f)} + \frac{i\operatorname{Li}_2\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\log^2(f)}}{2\sqrt{b}}}{a\log(f)} + \frac{\frac{\frac{ix^3}{3\sqrt{a}} - \frac{ix^2\log\left(1+\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\log(f)} - \frac{2ix\operatorname{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\log^2(f)} + \frac{2i\operatorname{Li}_3\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\log^3(f)}}{2\sqrt{b}} + \frac{-\frac{ix^3}{3\sqrt{a}} + \frac{ix^2\log\left(1-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\log(f)} + \frac{2ix\operatorname{Li}_2\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\log^2(f)} - \frac{2i\operatorname{Li}_3\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\log^3(f)}}{2\sqrt{b}}}{2a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f^x*x^2)/(a + b*f^(2*x))^2,x]
```

```
[Out] (f^x*x^2)/(2*a*(a + b*f^(2*x))*Log[f]) - ((((I/2)*x^2)/Sqrt[a] - (I*x*Log[1
 + (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Log[f]) - (I*PolyLog[2, ((-I)*Sqrt[b]
*f^x)/Sqrt[a]])/(Sqrt[a]*Log[f]^2))/(2*Sqrt[b]) + (((-1/2*I)*x^2)/Sqrt[a] +
 (I*x*Log[1 - (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Log[f]) + (I*PolyLog[2, (I
*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Log[f]^2))/(2*Sqrt[b]))/(a*Log[f]) + ((((I
/3)*x^3)/Sqrt[a] - (I*x^2*Log[1 + (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Log[f]
) - ((2*I)*x*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Log[f]^2) + (
(2*I)*PolyLog[3, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Log[f]^3))/(2*Sqrt[b
]) + (((-1/3*I)*x^3)/Sqrt[a] + (I*x^2*Log[1 - (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sq
rt[a]*Log[f]) + ((2*I)*x*PolyLog[2, (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Log[
f]^2) - ((2*I)*PolyLog[3, (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Log[f]^3))/(2*
Sqrt[b]))/(2*a)
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{f^{x} x^{2}}{\left(a +b \,f^{2 x}\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x*x^2/(a+b*f^(2*x))^2,x)
```

```
[Out] int(f^x*x^2/(a+b*f^(2*x))^2,x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*f^x*x^2/(a*b*f^(2*x)*log(f) + a^2*log(f)) + integrate(1/2*(x^2*log(f) -
 2*x)*f^x/(a*b*f^(2*x)*log(f) + a^2*log(f)), x)
```

Fricas [A]
time = 0.39, size = 388, normalized size = 1.17

$$\frac{2\,bf^{x}x^{2}\log\left(f\right)^{2} + 2\left(\left(bx\log\left(f\right) - b\right)f^{2\,x}\sqrt{-\frac{b}{a}} + \left(ax\log\left(f\right) - a\right)\sqrt{-\frac{b}{a}}\right){\rm Li}_2\left(f^{x}\sqrt{-\frac{b}{a}}\right) - 2\left(\left(bx\log\left(f\right) - b\right)f^{2\,x}\sqrt{-\frac{b}{a}} + \left(ax\log\left(f\right) - a\right)\sqrt{-\frac{b}{a}}\right){\rm Li}_2\left(-f^{x}\sqrt{-\frac{b}{a}}\right) - \left(\left(bx^{2}\log\left(f\right)^{2} - 2\,bx\log\left(f\right)\right)f^{2\,x}\sqrt{-\frac{b}{a}} + \left(ax^{2}\log\left(f\right)^{2} - 2\,ax\log\left(f\right)\right)\sqrt{-\frac{b}{a}}\right)\log\left(f^{x}\sqrt{-\frac{b}{a}} + 1\right) + \left(\left(bx^{2}\log\left(f\right)^{2} - 2\,bx\log\left(f\right)\right)f^{2\,x}\sqrt{-\frac{b}{a}} + \left(ax^{2}\log\left(f\right)^{2} - 2\,ax\log\left(f\right)\right)\sqrt{-\frac{b}{a}}\right)\log\left(-f^{x}\sqrt{-\frac{b}{a}} + 1\right) - 2\left(bf^{2\,x}\sqrt{-\frac{b}{a}} + a\sqrt{-\frac{b}{a}}\right){\rm polylog}\left(3, f^{x}\sqrt{-\frac{b}{a}}\right) + 2\left(bf^{2\,x}\sqrt{-\frac{b}{a}} + a\sqrt{-\frac{b}{a}}\right){\rm polylog}\left(3, -f^{x}\sqrt{-\frac{b}{a}}\right)}{4\left(ab^{2}f^{2\,x}\log\left(f\right)^{3} + a^{2}b\log\left(f\right)^{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*(2*b*f^x*x^2*log(f)^2 + 2*((b*x*log(f) - b)*f^(2*x)*sqrt(-b/a) + (a*x*l
og(f) - a)*sqrt(-b/a))*dilog(f^x*sqrt(-b/a)) - 2*((b*x*log(f) - b)*f^(2*x)*
```

```
sqrt(-b/a) + (a*x*log(f) - a)*sqrt(-b/a))*dilog(-f^x*sqrt(-b/a)) - ((b*x^2*
log(f)^2 - 2*b*x*log(f))*f^(2*x)*sqrt(-b/a) + (a*x^2*log(f)^2 - 2*a*x*log(f
))*sqrt(-b/a))*log(f^x*sqrt(-b/a) + 1) + ((b*x^2*log(f)^2 - 2*b*x*log(f))*f
^(2*x)*sqrt(-b/a) + (a*x^2*log(f)^2 - 2*a*x*log(f))*sqrt(-b/a))*log(-f^x*sq
rt(-b/a) + 1) - 2*(b*f^(2*x)*sqrt(-b/a) + a*sqrt(-b/a))*polylog(3, f^x*sqrt
(-b/a)) + 2*(b*f^(2*x)*sqrt(-b/a) + a*sqrt(-b/a))*polylog(3, -f^x*sqrt(-b/a
)))/(a*b^2*f^(2*x)*log(f)^3 + a^2*b*log(f)^3)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{f^x x^2}{2a^2\log(f) + 2abf^{2x}\log(f)} + \frac{\int\left(-\frac{2f^x x}{a+bf^{2x}}\right)dx + \int\frac{f^x x^2\log(f)}{a+bf^{2x}}\,dx}{2a\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**x*x**2/(a+b*f**(2*x))**2,x)
```

```
[Out] f**x*x**2/(2*a**2*log(f) + 2*a*b*f**(2*x)*log(f)) + (Integral(-2*f**x*x/(a
+ b*f**(2*x)), x) + Integral(f**x*x**2*log(f)/(a + b*f**(2*x)), x))/(2*a*lo
g(f))
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^x*x^2/(b*f^(2*x) + a)^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{f^x\,x^2}{{\left(a+b\,f^{2\,x}\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f^x*x^2)/(a + b*f^(2*x))^2,x)
```

```
[Out] int((f^x*x^2)/(a + b*f^(2*x))^2, x)
```

3.50 $\int \frac{f^x x^3}{(a+bf^{2x})^2} \, dx$

Optimal. Leaf size=501

$$-\frac{3x^2 \tan^{-1}\left(\frac{\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\, \log^2(f)}+\frac{f^x x^3}{2a\,(a+bf^{2x})\log(f)}+\frac{x^3 \tan^{-1}\left(\frac{\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\, \log(f)}+\frac{3ix\text{Li}_2\left(-\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\, \log^3(f)}-\frac{3ix^2\text{Li}_2\left(-\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{4a^{3/2}\sqrt{b}\, \log^2(f)}$$

```
[Out] 1/2*f^x*x^3/a/(a+b*f^(2*x))/ln(f)-3/2*x^2*arctan(f^x*b^(1/2)/a^(1/2))/a^(3/
2)/ln(f)^2/b^(1/2)+1/2*x^3*arctan(f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)/b^(1/2
)+3/2*I*x*polylog(2,-I*f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)^3/b^(1/2)-3/4*I*x
^2*polylog(2,-I*f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)^2/b^(1/2)-3/2*I*x*polylo
g(2,I*f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)^3/b^(1/2)+3/4*I*x^2*polylog(2,I*f^
x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)^2/b^(1/2)-3/2*I*polylog(3,-I*f^x*b^(1/2)/a
^(1/2))/a^(3/2)/ln(f)^4/b^(1/2)+3/2*I*x*polylog(3,-I*f^x*b^(1/2)/a^(1/2))/a
^(3/2)/ln(f)^3/b^(1/2)+3/2*I*polylog(3,I*f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)
^4/b^(1/2)-3/2*I*x*polylog(3,I*f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)^3/b^(1/2)
-3/2*I*polylog(4,-I*f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)^4/b^(1/2)+3/2*I*poly
log(4,I*f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)^4/b^(1/2)
```

Rubi [A]
time = 0.37, antiderivative size = 501, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 11, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.611$, Rules used = {2281, 205, 211, 2277, 14, 12, 5251, 2611, 2320, 6724, 6744}

$$-\frac{3ix^2\text{PolyLog}\left(2,-\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{4a^{3/2}\sqrt{b}\, \log^2(f)}+\frac{3ix^2\text{PolyLog}\left(2,\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{4a^{3/2}\sqrt{b}\, \log^2(f)}-\frac{3i\text{PolyLog}\left(3,-\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\, \log^4(f)}+\frac{3i\text{PolyLog}\left(3,\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\, \log^4(f)}-\frac{3i\text{PolyLog}\left(4,-\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\, \log^4(f)}+\frac{3i\text{PolyLog}\left(4,\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\, \log^4(f)}+\frac{3ix\text{PolyLog}\left(2,-\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\, \log^3(f)}-\frac{3ix\text{PolyLog}\left(2,\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\, \log^3(f)}+\frac{3ix\text{PolyLog}\left(3,-\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\, \log^3(f)}-\frac{3ix\text{PolyLog}\left(3,\frac{i\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\, \log^3(f)}+\frac{x^3\text{ArcTan}\left(\frac{\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\, \log(f)}-\frac{3x^2\text{ArcTan}\left(\frac{\sqrt{b}\, f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\, \log^2(f)}+\frac{x^3 f^x}{2a\log(f)\,(a+bf^{2x})}$$

Antiderivative was successfully verified.

```
[In] Int[(f^x*x^3)/(a + b*f^(2*x))^2,x]
```

```
[Out] (-3*x^2*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(2*a^(3/2)*Sqrt[b]*Log[f]^2) + (f^x*
x^3)/(2*a*(a + b*f^(2*x))*Log[f]) + (x^3*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(2*
a^(3/2)*Sqrt[b]*Log[f]) + (((3*I)/2)*x*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a
]])/(a^(3/2)*Sqrt[b]*Log[f]^3) - (((3*I)/4)*x^2*PolyLog[2, ((-I)*Sqrt[b]*f^
x)/Sqrt[a]])/(a^(3/2)*Sqrt[b]*Log[f]^2) - (((3*I)/2)*x*PolyLog[2, (I*Sqrt[b
]*f^x)/Sqrt[a]])/(a^(3/2)*Sqrt[b]*Log[f]^3) + (((3*I)/4)*x^2*PolyLog[2, (I*
Sqrt[b]*f^x)/Sqrt[a]])/(a^(3/2)*Sqrt[b]*Log[f]^2) - (((3*I)/2)*PolyLog[3, (
(-I)*Sqrt[b]*f^x)/Sqrt[a]])/(a^(3/2)*Sqrt[b]*Log[f]^4) + (((3*I)/2)*x*PolyL
og[3, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(a^(3/2)*Sqrt[b]*Log[f]^3) + (((3*I)/2)*
PolyLog[3, (I*Sqrt[b]*f^x)/Sqrt[a]])/(a^(3/2)*Sqrt[b]*Log[f]^4) - (((3*I)/2
)*x*PolyLog[3, (I*Sqrt[b]*f^x)/Sqrt[a]])/(a^(3/2)*Sqrt[b]*Log[f]^3) - (((3*
I)/2)*PolyLog[4, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(a^(3/2)*Sqrt[b]*Log[f]^4) +
(((3*I)/2)*PolyLog[4, (I*Sqrt[b]*f^x)/Sqrt[a]])/(a^(3/2)*Sqrt[b]*Log[f]^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integ
erQ[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denom
inator[p + 1/n] < Denominator[p])
```

Rule 211

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

Rule 2277

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 5251

```
Int[ArcTan[(a_.) + (b_.)*(f_)^((c_.) + (d_.)*(x_))]*(x_)^(m_.), x_Symbol] :
> Dist[I/2, Int[x^m*Log[1 - I*a - I*b*f^(c + d*x)], x], x] - Dist[I/2, Int[
x^m*Log[1 + I*a + I*b*f^(c + d*x)], x], x] /; FreeQ[{a, b, c, d, f}, x] &&
IntegerQ[m] && m > 0
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6744

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Dist[f*(m/(b*c*p*Log[F])), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{f^x x^3}{\left(a+bf^{2x}\right)^2}\,dx = \frac{f^x x^3}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} - 3\int x^2\left(\frac{f^x}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{\tan^{-1}\left(\cdots\right.}{2a^{3/2}\sqrt{b}\cdots}\right.$$

$$= \frac{f^x x^3}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} - 3\int\left(\frac{f^x x^2}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^2\tan^{-1}\left(\cdots\right.}{2a^{3/2}\sqrt{b}\cdots}\right.$$

$$= \frac{f^x x^3}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} - \frac{3\int\frac{f^x x^2}{a+bf^{2x}}\,dx}{2a\log(f)} - \frac{3\int x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)dx\cdots}{2a^{3/2}\sqrt{b}\,\log(f)}$$

$$= -\frac{3x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log^2(f)} + \frac{f^x x^3}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} + \frac{3\int\frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f\cdots}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\,\log(\cdots}}{a\log(f)}\cdots$$

$$= -\frac{3x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log^2(f)} + \frac{f^x x^3}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} - \frac{3ix^2\mathrm{Li}_2\left(-\frac{i\sqrt{b}\cdots}{\sqrt{a}}\cdots\right.}{4a^{3/2}\sqrt{b}\,\log^2(\cdots}$$

$$= -\frac{3x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log^2(f)} + \frac{f^x x^3}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} - \frac{3ix^2\mathrm{Li}_2\left(-\frac{i\sqrt{b}\cdots}{\sqrt{a}}\cdots\right.}{4a^{3/2}\sqrt{b}\,\log^2(\cdots}$$

$$= -\frac{3x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log^2(f)} + \frac{f^x x^3}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} + \frac{3ix\mathrm{Li}_2\left(-\frac{i\sqrt{b}\,f\cdots}{\sqrt{a}}\cdots\right.}{2a^{3/2}\sqrt{b}\,\log^3(\cdots}$$

$$= -\frac{3x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log^2(f)} + \frac{f^x x^3}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} + \frac{3ix\mathrm{Li}_2\left(-\frac{i\sqrt{b}\,f\cdots}{\sqrt{a}}\cdots\right.}{2a^{3/2}\sqrt{b}\,\log^3(\cdots}$$

$$= -\frac{3x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log^2(f)} + \frac{f^x x^3}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} + \frac{3ix\mathrm{Li}_2\left(-\frac{i\sqrt{b}\,f\cdots}{\sqrt{a}}\cdots\right.}{2a^{3/2}\sqrt{b}\,\log^3(\cdots}$$

<u>Mathematica</u> [A]

time = 0.21, size = 434, normalized size = 0.87

$$\frac{\frac{2\sqrt{a}\,f^x x^3\log^3(f)}{a+bf^{2x}} - \frac{3ix^2\log^2(f)\log\left(1-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{b}} + \frac{ix^3\log^3(f)\log\left(1-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{b}} + \frac{3ix^2\log^2(f)\log\left(1+\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{b}} - \frac{ix^3\log^3(f)\log\left(1+\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{b}} - \frac{3ix\log(f)(-2+x\log(f))\mathrm{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{b}} + \frac{3ix\log(f)(-2+x\log(f))\mathrm{Li}_2\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{b}} - \frac{6i\mathrm{Li}_3\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{b}} + \frac{6ix\log(f)\mathrm{Li}_3\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{b}} + \frac{6i\mathrm{Li}_3\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{b}} - \frac{6ix\log(f)\mathrm{Li}_3\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{b}} - \frac{6i\mathrm{Li}_4\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{b}} + \frac{6i\mathrm{Li}_4\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{b}}}{4a^{3/2}\log^4(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f^x*x^3)/(a + b*f^(2*x))^2,x]
```

```
[Out] ((2*Sqrt[a]*f^x*x^3*Log[f]^3)/(a + b*f^(2*x)) - ((3*I)*x^2*Log[f]^2*Log[1 -
 (I*Sqrt[b]*f^x)/Sqrt[a]])/Sqrt[b] + (I*x^3*Log[f]^3*Log[1 - (I*Sqrt[b]*f^x
)/Sqrt[a]])/Sqrt[b] + ((3*I)*x^2*Log[f]^2*Log[1 + (I*Sqrt[b]*f^x)/Sqrt[a]])
/Sqrt[b] - (I*x^3*Log[f]^3*Log[1 + (I*Sqrt[b]*f^x)/Sqrt[a]])/Sqrt[b] - ((3*
I)*x*Log[f]*(-2 + x*Log[f])*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/Sqrt[b]
 + ((3*I)*x*Log[f]*(-2 + x*Log[f])*PolyLog[2, (I*Sqrt[b]*f^x)/Sqrt[a]])/Sqr
t[b] - ((6*I)*PolyLog[3, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/Sqrt[b] + ((6*I)*x*Lo
g[f]*PolyLog[3, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/Sqrt[b] + ((6*I)*PolyLog[3, (I
*Sqrt[b]*f^x)/Sqrt[a]])/Sqrt[b] - ((6*I)*x*Log[f]*PolyLog[3, (I*Sqrt[b]*f^x
)/Sqrt[a]])/Sqrt[b] - ((6*I)*PolyLog[4, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/Sqrt[b
] + ((6*I)*PolyLog[4, (I*Sqrt[b]*f^x)/Sqrt[a]])/Sqrt[b])/(4*a^(3/2)*Log[f]^
4)
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{f^{x} x^{3}}{\left(a + b\, f^{2x}\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x*x^3/(a+b*f^(2*x))^2,x)
```

```
[Out] int(f^x*x^3/(a+b*f^(2*x))^2,x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x^3/(a+b*f^(2*x))^2,x, algorithm="maxima")
```

```
[Out] 1/2*f^x*x^3/(a*b*f^(2*x)*log(f) + a^2*log(f)) + integrate(1/2*(x^3*log(f) -
 3*x^2)*f^x/(a*b*f^(2*x)*log(f) + a^2*log(f)), x)
```

Fricas [A]
time = 0.39, size = 549, normalized size = 1.10

$$\frac{2 \, b f^{x} x^{3} \log\left(f\right)^{3} + 3 \, {\left({\left(b x^{2} \log\left(f\right)^{2} - 2 \, b x \log\left(f\right)\right)} f^{2 \, x} \sqrt{-\frac{b}{a}} + {\left(a x^{2} \log\left(f\right)^{2} - 2 \, a x \log\left(f\right)\right)} \sqrt{-\frac{b}{a}}\right)} {\rm Li}_2\left(f^{x} \sqrt{-\frac{b}{a}}\right) - 3 \, {\left({\left(b x^{2} \log\left(f\right)^{2} - 2 \, b x \log\left(f\right)\right)} f^{2 \, x} \sqrt{-\frac{b}{a}} + {\left(a x^{2} \log\left(f\right)^{2} - 2 \, a x \log\left(f\right)\right)} \sqrt{-\frac{b}{a}}\right)} {\rm Li}_2\left(-f^{x} \sqrt{-\frac{b}{a}}\right) - {\left({\left(b x^{3} \log\left(f\right)^{3} - 3 \, b x^{2} \log\left(f\right)^{2}\right)} f^{2 \, x} \sqrt{-\frac{b}{a}} + {\left(a x^{3} \log\left(f\right)^{3} - 3 \, a x^{2} \log\left(f\right)^{2}\right)} \sqrt{-\frac{b}{a}}\right)} \log\left(f^{x} \sqrt{-\frac{b}{a}} + 1\right) + {\left({\left(b x^{3} \log\left(f\right)^{3} - 3 \, b x^{2} \log\left(f\right)^{2}\right)} f^{2 \, x} \sqrt{-\frac{b}{a}} + {\left(a x^{3} \log\left(f\right)^{3} - 3 \, a x^{2} \log\left(f\right)^{2}\right)} \sqrt{-\frac{b}{a}}\right)} \log\left(-f^{x} \sqrt{-\frac{b}{a}} + 1\right) + 6 \, {\left(b f^{2 \, x} \sqrt{-\frac{b}{a}} + a \sqrt{-\frac{b}{a}}\right)} {\rm polylog}\left(4, f^{x} \sqrt{-\frac{b}{a}}\right) - 6 \, {\left(b f^{2 \, x} \sqrt{-\frac{b}{a}} + a \sqrt{-\frac{b}{a}}\right)} {\rm polylog}\left(4, -f^{x} \sqrt{-\frac{b}{a}}\right) - 6 \, {\left({\left(b x \log\left(f\right) - b\right)} f^{2 \, x} \sqrt{-\frac{b}{a}} + {\left(a x \log\left(f\right) - a\right)} \sqrt{-\frac{b}{a}}\right)} {\rm polylog}\left(3, f^{x} \sqrt{-\frac{b}{a}}\right) + 6 \, {\left({\left(b x \log\left(f\right) - b\right)} f^{2 \, x} \sqrt{-\frac{b}{a}} + {\left(a x \log\left(f\right) - a\right)} \sqrt{-\frac{b}{a}}\right)} {\rm polylog}\left(3, -f^{x} \sqrt{-\frac{b}{a}}\right)}{4 \, {\left(a b^{2} f^{2 \, x} \log\left(f\right)^{4} + a^{2} b \log\left(f\right)^{4}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x^3/(a+b*f^(2*x))^2,x, algorithm="fricas")
```

```
[Out] 1/4*(2*b*f^x*x^3*log(f)^3 + 3*((b*x^2*log(f)^2 - 2*b*x*log(f))*f^(2*x)*sqrt
(-b/a) + (a*x^2*log(f)^2 - 2*a*x*log(f))*sqrt(-b/a))*dilog(f^x*sqrt(-b/a))
- 3*((b*x^2*log(f)^2 - 2*b*x*log(f))*f^(2*x)*sqrt(-b/a) + (a*x^2*log(f)^2 -
 2*a*x*log(f))*sqrt(-b/a))*dilog(-f^x*sqrt(-b/a)) - ((b*x^3*log(f)^3 - 3*b*
x^2*log(f)^2)*f^(2*x)*sqrt(-b/a) + (a*x^3*log(f)^3 - 3*a*x^2*log(f)^2)*sqrt
(-b/a))*log(f^x*sqrt(-b/a) + 1) + ((b*x^3*log(f)^3 - 3*b*x^2*log(f)^2)*f^(2
*x)*sqrt(-b/a) + (a*x^3*log(f)^3 - 3*a*x^2*log(f)^2)*sqrt(-b/a))*log(-f^x*s
qrt(-b/a) + 1) + 6*(b*f^(2*x)*sqrt(-b/a) + a*sqrt(-b/a))*polylog(4, f^x*sqr
t(-b/a)) - 6*(b*f^(2*x)*sqrt(-b/a) + a*sqrt(-b/a))*polylog(4, -f^x*sqrt(-b/
a)) - 6*((b*x*log(f) - b)*f^(2*x)*sqrt(-b/a) + (a*x*log(f) - a)*sqrt(-b/a))
*polylog(3, f^x*sqrt(-b/a)) + 6*((b*x*log(f) - b)*f^(2*x)*sqrt(-b/a) + (a*x
*log(f) - a)*sqrt(-b/a))*polylog(3, -f^x*sqrt(-b/a)))/(a*b^2*f^(2*x)*log(f)
^4 + a^2*b*log(f)^4)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{f^x x^3}{2a^2\log(f) + 2abf^{2x}\log(f)} + \frac{\int\left(-\frac{3f^x x^2}{a+bf^{2x}}\right)dx + \int\frac{f^x x^3\log(f)}{a+bf^{2x}}\,dx}{2a\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**x*x**3/(a+b*f**(2*x))**2,x)
```

```
[Out] f**x*x**3/(2*a**2*log(f) + 2*a*b*f**(2*x)*log(f)) + (Integral(-3*f**x*x**2/
(a + b*f**(2*x)), x) + Integral(f**x*x**3*log(f)/(a + b*f**(2*x)), x))/(2*a
*log(f))
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x^3/(a+b*f^(2*x))^2,x, algorithm="giac")
```

```
[Out] integrate(f^x*x^3/(b*f^(2*x) + a)^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{f^x\,x^3}{{\left(a+b\,f^{2\,x}\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f^x*x^3)/(a + b*f^(2*x))^2,x)
```

```
[Out] int((f^x*x^3)/(a + b*f^(2*x))^2, x)
```

3.51 $\int \frac{f^x}{(a+bf^{2x})^3}\, dx$

Optimal. Leaf size=84

$$\frac{f^x}{4a(a+bf^{2x})^2\log(f)}+\frac{3f^x}{8a^2(a+bf^{2x})\log(f)}+\frac{3\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\,\log(f)}$$

```
[Out] 1/4*f^x/a/(a+b*f^(2*x))^2/ln(f)+3/8*f^x/a^2/(a+b*f^(2*x))/ln(f)+3/8*arctan(
f^x*b^(1/2)/a^(1/2))/a^(5/2)/ln(f)/b^(1/2)
```

Rubi [A]
time = 0.03, antiderivative size = 84, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2281, 205, 211}

$$\frac{3\text{ArcTan}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\,\log(f)}+\frac{3f^x}{8a^2\log(f)(a+bf^{2x})}+\frac{f^x}{4a\log(f)(a+bf^{2x})^2}$$

Antiderivative was successfully verified.

```
[In] Int[f^x/(a + b*f^(2*x))^3,x]
```

```
[Out] f^x/(4*a*(a + b*f^(2*x))^2*Log[f]) + (3*f^x)/(8*a^2*(a + b*f^(2*x))*Log[f])
 + (3*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(8*a^(5/2)*Sqrt[b]*Log[f])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integ
erQ[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denom
inator[p + 1/n] < Denominator[p])
```

Rule 211

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

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
```

```
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{f^x}{\left(a+bf^{2x}\right)^3}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{(a+bx^2)^3}\,dx, x, f^x\right)}{\log(f)}\\
&= \frac{f^x}{4a\left(a+bf^{2x}\right)^2\log(f)}+\frac{3\text{Subst}\left(\int \frac{1}{(a+bx^2)^2}\,dx, x, f^x\right)}{4a\log(f)}\\
&= \frac{f^x}{4a\left(a+bf^{2x}\right)^2\log(f)}+\frac{3f^x}{8a^2\left(a+bf^{2x}\right)\log(f)}+\frac{3\text{Subst}\left(\int \frac{1}{a+bx^2}\,dx, x, f^x\right)}{8a^2\log(f)}\\
&= \frac{f^x}{4a\left(a+bf^{2x}\right)^2\log(f)}+\frac{3f^x}{8a^2\left(a+bf^{2x}\right)\log(f)}+\frac{3\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\,\log(f)}
\end{aligned}$$

Mathematica [A]
time = 0.11, size = 68, normalized size = 0.81

$$\frac{\frac{5af^x+3bf^{3x}}{8a^2(a+bf^{2x})^2}+\frac{3\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}}}{\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^x/(a + b*f^(2*x))^3,x]
```

```
[Out] ((5*a*f^x + 3*b*f^(3*x))/(8*a^2*(a + b*f^(2*x))^2) + (3*ArcTan[(Sqrt[b]*f^x
)/Sqrt[a]])/(8*a^(5/2)*Sqrt[b]))/Log[f]
```

Maple [A]
time = 0.04, size = 94, normalized size = 1.12

method	result	size
risch	$\frac{f^x\left(3b\,f^{2x}+5a\right)}{8\ln(f)a^2\left(a+b\,f^{2x}\right)^2}-\frac{3\ln\left(f^x-\frac{a}{\sqrt{-ba}}\right)}{16\sqrt{-ba}\,a^2\ln(f)}+\frac{3\ln\left(f^x+\frac{a}{\sqrt{-ba}}\right)}{16\sqrt{-ba}\,a^2\ln(f)}$	94

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x/(a+b*f^(2*x))^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/8*f^x*(3*b*(f^x)^2+5*a)/ln(f)/a^2/(a+b*(f^x)^2)^2-3/16/(-b*a)^(1/2)/a^2/l
n(f)*ln(f^x-1/(-b*a)^(1/2)*a)+3/16/(-b*a)^(1/2)/a^2/ln(f)*ln(f^x+1/(-b*a)^(
1/2)*a)
```

Maxima [A]
time = 0.49, size = 76, normalized size = 0.90

$$\frac{3\,bf^{3\,x}+5\,af^{x}}{8\,\left(a^{2}b^{2}f^{4\,x}+2\,a^{3}bf^{2\,x}+a^{4}\right)\log\left(f\right)}+\frac{3\,\arctan\left(\frac{bf^{x}}{\sqrt{ab}}\right)}{8\,\sqrt{ab}\,a^{2}\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x/(a+b*f^(2*x))^3,x, algorithm="maxima")
```

```
[Out] 1/8*(3*b*f^(3*x) + 5*a*f^x)/((a^2*b^2*f^(4*x) + 2*a^3*b*f^(2*x) + a^4)*log(
f)) + 3/8*arctan(b*f^x/sqrt(a*b))/(sqrt(a*b)*a^2*log(f))
```

Fricas [A]
time = 0.41, size = 258, normalized size = 3.07

$$\left[\frac{6\,ab^{2}f^{3\,x}+10\,a^{2}bf^{x}-3\,\left(\sqrt{-ab}\,b^{2}f^{4\,x}+2\,\sqrt{-ab}\,abf^{2\,x}+\sqrt{-ab}\,a^{2}\right)\log\left(\frac{bf^{2\,x}-2\,\sqrt{-ab}\,f^{x}-a}{bf^{2\,x}+a}\right)}{16\,\left(a^{3}b^{3}f^{4\,x}\log\left(f\right)+2\,a^{4}b^{2}f^{2\,x}\log\left(f\right)+a^{5}b\log\left(f\right)\right)},\ \frac{3\,ab^{2}f^{3\,x}+5\,a^{2}bf^{x}-3\,\left(\sqrt{ab}\,b^{2}f^{4\,x}+2\,\sqrt{ab}\,abf^{2\,x}+\sqrt{ab}\,a^{2}\right)\arctan\left(\frac{\sqrt{ab}}{bf^{x}}\right)}{8\,\left(a^{3}b^{3}f^{4\,x}\log\left(f\right)+2\,a^{4}b^{2}f^{2\,x}\log\left(f\right)+a^{5}b\log\left(f\right)\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x/(a+b*f^(2*x))^3,x, algorithm="fricas")
```

```
[Out] [1/16*(6*a*b^2*f^(3*x) + 10*a^2*b*f^x - 3*(sqrt(-a*b)*b^2*f^(4*x) + 2*sqrt(
-a*b)*a*b*f^(2*x) + sqrt(-a*b)*a^2)*log((b*f^(2*x) - 2*sqrt(-a*b)*f^x - a)/
(b*f^(2*x) + a)))/(a^3*b^3*f^(4*x)*log(f) + 2*a^4*b^2*f^(2*x)*log(f) + a^5*
b*log(f)), 1/8*(3*a*b^2*f^(3*x) + 5*a^2*b*f^x - 3*(sqrt(a*b)*b^2*f^(4*x) +
2*sqrt(a*b)*a*b*f^(2*x) + sqrt(a*b)*a^2)*arctan(sqrt(a*b)/(b*f^x)))/(a^3*b^
3*f^(4*x)*log(f) + 2*a^4*b^2*f^(2*x)*log(f) + a^5*b*log(f))]
```

Sympy [A]
time = 0.13, size = 85, normalized size = 1.01

$$\frac{5af^{x}+3bf^{3x}}{8a^{4}\log\left(f\right)+16a^{3}bf^{2x}\log\left(f\right)+8a^{2}b^{2}f^{4x}\log\left(f\right)}+\frac{\operatorname{RootSum}\left(256z^{2}a^{5}b+9,\left(i\mapsto i\log\left(\frac{16ia^{3}}{3}+f^{x}\right)\right)\right)}{\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**x/(a+b*f**(2*x))**3,x)
```

```
[Out] (5*a*f**x + 3*b*f**(3*x))/(8*a**4*log(f) + 16*a**3*b*f**(2*x)*log(f) + 8*a*
*2*b**2*f**(4*x)*log(f)) + RootSum(256*_z**2*a**5*b + 9, Lambda(_i, _i*log(
16*_i*a**3/3 + f**x)))/log(f)
```

Giac [A]
time = 1.48, size = 61, normalized size = 0.73

$$\frac{3 \arctan\left(\frac{bf^{x}}{\sqrt{ab}}\right)}{8 \sqrt{ab}\, a^{2} \log\left(f\right)} + \frac{3 \, bf^{3 \, x} + 5 \, af^{x}}{8 \, {\left(bf^{2 \, x} + a\right)}^{2} a^{2} \log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x/(a+b*f^(2*x))^3,x, algorithm="giac")
```

```
[Out] 3/8*arctan(b*f^x/sqrt(a*b))/(sqrt(a*b)*a^2*log(f)) + 1/8*(3*b*f^(3*x) + 5*a
*f^x)/((b*f^(2*x) + a)^2*a^2*log(f))
```

Mupad [B]
time = 3.57, size = 79, normalized size = 0.94

$$\frac{\frac{5\,f^x}{8\,a\,\ln(f)}+\frac{3\,b\,f^{3\,x}}{8\,a^2\,\ln(f)}}{b^2\,f^{4\,x}+a^2+2\,a\,b\,f^{2\,x}}+\frac{3\,\mathrm{atan}\left(\frac{b\,f^x}{\sqrt{a\,b}}\right)}{8\,a^2\,\ln\left(f\right)\,\sqrt{a\,b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x/(a + b*f^(2*x))^3,x)
```

```
[Out] ((5*f^x)/(8*a*log(f)) + (3*b*f^(3*x))/(8*a^2*log(f)))/(b^2*f^(4*x) + a^2 +
2*a*b*f^(2*x)) + (3*atan((b*f^x)/(a*b)^(1/2)))/(8*a^2*log(f)*(a*b)^(1/2))
```

3.52 $\int \frac{f^x x}{\left(a+bf^{2x}\right)^3}\,dx$

Optimal. Leaf size=223

$$-\frac{f^x}{8a^2\left(a+bf^{2x}\right)\log^2(f)}-\frac{\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{5/2}\sqrt{b}\,\log^2(f)}+\frac{f^x x}{4a\left(a+bf^{2x}\right)^2\log(f)}+\frac{3f^x x}{8a^2\left(a+bf^{2x}\right)\log(f)}+\frac{3x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\,\log(f)}$$

```
[Out] -1/8*f^x/a^2/(a+b*f^(2*x))/ln(f)^2+1/4*f^x*x/a/(a+b*f^(2*x))^2/ln(f)+3/8*f^
x*x/a^2/(a+b*f^(2*x))/ln(f)-1/2*arctan(f^x*b^(1/2)/a^(1/2))/a^(5/2)/ln(f)^2
/b^(1/2)+3/8*x*arctan(f^x*b^(1/2)/a^(1/2))/a^(5/2)/ln(f)/b^(1/2)-3/16*I*pol
ylog(2,-I*f^x*b^(1/2)/a^(1/2))/a^(5/2)/ln(f)^2/b^(1/2)+3/16*I*polylog(2,I*f
^x*b^(1/2)/a^(1/2))/a^(5/2)/ln(f)^2/b^(1/2)
```

Rubi [A]

time = 0.15, antiderivative size = 223, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 7, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.438$, Rules used = {2281, 205, 211, 2277, 2320, 4940, 2438}

$$-\frac{3i\text{PolyLog}\left(2,-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{16a^{5/2}\sqrt{b}\,\log^2(f)}+\frac{3i\text{PolyLog}\left(2,\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{16a^{5/2}\sqrt{b}\,\log^2(f)}-\frac{\text{ArcTan}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{5/2}\sqrt{b}\,\log^2(f)}+\frac{3x\text{ArcTan}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\,\log(f)}-\frac{f^x}{8a^2\log^2(f)\left(a+bf^{2x}\right)}+\frac{3xf^x}{8a^2\log(f)\left(a+bf^{2x}\right)}+\frac{xf^x}{4a\log(f)\left(a+bf^{2x}\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f^x*x)/(a + b*f^(2*x))^3,x]
```

```
[Out] -1/8*f^x/(a^2*(a + b*f^(2*x))*Log[f]^2) - ArcTan[(Sqrt[b]*f^x)/Sqrt[a]]/(2*
a^(5/2)*Sqrt[b]*Log[f]^2) + (f^x*x)/(4*a*(a + b*f^(2*x))^2*Log[f]) + (3*f^x
*x)/(8*a^2*(a + b*f^(2*x))*Log[f]) + (3*x*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(8
*a^(5/2)*Sqrt[b]*Log[f]) - (((3*I)/16)*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a
]])/(a^(5/2)*Sqrt[b]*Log[f]^2) + (((3*I)/16)*PolyLog[2, (I*Sqrt[b]*f^x)/Sqr
t[a]])/(a^(5/2)*Sqrt[b]*Log[f]^2)
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integ
erQ[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denom
inator[p + 1/n] < Denominator[p])
```

Rule 211

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

Rule 2277

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

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

Rule 4940

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

Rubi steps

$$\int \frac{f^x x}{(a+bf^{2x})^3}\,dx = \frac{f^x x}{4a(a+bf^{2x})^2\log(f)} + \frac{3f^x x}{8a^2(a+bf^{2x})\log(f)} + \frac{3x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\,\log(f)} - \int \left(\frac{f^x}{4a(a+bf^{2x}\right.$$

$$= \frac{f^x x}{4a(a+bf^{2x})^2\log(f)} + \frac{3f^x x}{8a^2(a+bf^{2x})\log(f)} + \frac{3x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\,\log(f)} - \frac{3\int \frac{f^x}{a+bf^{2x}}\,dx}{8a^2\log(f)} - \frac{\int}{}$$

$$= \frac{f^x x}{4a(a+bf^{2x})^2\log(f)} + \frac{3f^x x}{8a^2(a+bf^{2x})\log(f)} + \frac{3x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\,\log(f)} - \frac{3\mathrm{Subst}\left(\int \frac{1}{a+bx^2}\,dx\right.}{8a^2\log^2(f}$$

$$= -\frac{f^x}{8a^2(a+bf^{2x})\log^2(f)} - \frac{3\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\,\log^2(f)} + \frac{f^x x}{4a(a+bf^{2x})^2\log(f)} + \frac{3f^x x}{8a^2(a+bf^{2x})\log}$$

$$= -\frac{f^x}{8a^2(a+bf^{2x})\log^2(f)} - \frac{\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{5/2}\sqrt{b}\,\log^2(f)} + \frac{f^x x}{4a(a+bf^{2x})^2\log(f)} + \frac{3f^x x}{8a^2(a+bf^{2x})\log}$$

Mathematica [A]
time = 0.25, size = 184, normalized size = 0.83

$$\frac{-\frac{16\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}} + \frac{8af^x x\log(f)}{(a+bf^{2x})^2} + \frac{4f^x(-1+3x\log(f))}{a+bf^{2x}} + \frac{6i\left(x\log(f)\left(\log\left(1-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)-\log\left(1+\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)\right)-\mathrm{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)+\mathrm{Li}_2\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)\right)}{\sqrt{a}\,\sqrt{b}}}{32a^2\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f^x*x)/(a + b*f^(2*x))^3,x]
```

```
[Out] ((-16*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]) + (8*a*f^x*x*Log[f])
/(a + b*f^(2*x))^2 + (4*f^x*(-1 + 3*x*Log[f]))/(a + b*f^(2*x)) + ((6*I)*(x*
Log[f]*(Log[1 - (I*Sqrt[b]*f^x)/Sqrt[a]] - Log[1 + (I*Sqrt[b]*f^x)/Sqrt[a]]
) - PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]] + PolyLog[2, (I*Sqrt[b]*f^x)/Sqr
t[a]]))/(Sqrt[a]*Sqrt[b]))/(32*a^2*Log[f]^2)
```

Maple [A]
time = 0.05, size = 223, normalized size = 1.00

method	result
risch	$\frac{f^{x}\left(3xb\,f^{2x}\ln\left(f\right)+5\ln\left(f\right)ax-b\,f^{2x}-a\right)}{8\ln\left(f\right)^{2}a^{2}\left(a+b\,f^{2x}\right)^{2}}-\frac{\arctan\left(\frac{b\,f^{x}}{\sqrt{ba}}\right)}{2\ln\left(f\right)^{2}a^{2}\sqrt{ba}}+\frac{3x\ln\left(\frac{-b\,f^{x}+\sqrt{-ba}}{\sqrt{-ba}}\right)}{16\ln\left(f\right)a^{2}\sqrt{-ba}}-\frac{3x\ln\left(\frac{b\,f^{x}+\sqrt{-ba}}{\sqrt{-ba}}\right)}{16\ln\left(f\right)a^{2}\sqrt{-ba}}+\frac{3\,\mathrm{dilog}}{16}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(f^x*x/(a+b*f^(2*x))^3,x,method=_RETURNVERBOSE)

[Out] 1/8*f^x*(3*ln(f)*b*x*(f^x)^2+5*ln(f)*a*x-b*(f^x)^2-a)/ln(f)^2/a^2/(a+b*(f^x)^2)^2-1/2/ln(f)^2/a^2/(b*a)^(1/2)*arctan(b*f^x/(b*a)^(1/2))+3/16/ln(f)/a^2*x/(-b*a)^(1/2)*ln((-b*f^x+(-b*a)^(1/2))/(-b*a)^(1/2))-3/16/ln(f)/a^2*x/(-b*a)^(1/2)*ln((b*f^x+(-b*a)^(1/2))/(-b*a)^(1/2))+3/16/ln(f)^2/a^2/(-b*a)^(1/2)*dilog((-b*f^x+(-b*a)^(1/2))/(-b*a)^(1/2))-3/16/ln(f)^2/a^2/(-b*a)^(1/2)*dilog((b*f^x+(-b*a)^(1/2))/(-b*a)^(1/2))

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^x*x/(a+b*f^(2*x))^3,x, algorithm="maxima")

[Out] 1/8*((3*b*x*log(f) - b)*f^(3*x) + (5*a*x*log(f) - a)*f^x)/(a^2*b^2*f^(4*x)*log(f)^2 + 2*a^3*b*f^(2*x)*log(f)^2 + a^4*log(f)^2) + integrate(1/8*(3*x*log(f) - 4)*f^x/(a^2*b*f^(2*x)*log(f) + a^3*log(f)), x)

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 494 vs. $2(167) = 334$.
time = 0.41, size = 494, normalized size = 2.22

$$\frac{2\left(3b^{2}x\log\left(f\right)-b^{2}\right)f^{3x}+2\left(5abx\log\left(f\right)-ab\right)f^{x}+3\left(b^{2}f^{4x}\sqrt{-\frac{b}{a}}+2abf^{2x}\sqrt{-\frac{b}{a}}+a^{2}\sqrt{-\frac{b}{a}}\right)\mathrm{Li}_2\left(f^{x}\sqrt{-\frac{b}{a}}\right)-3\left(b^{2}f^{4x}\sqrt{-\frac{b}{a}}+2abf^{2x}\sqrt{-\frac{b}{a}}+a^{2}\sqrt{-\frac{b}{a}}\right)\mathrm{Li}_2\left(-f^{x}\sqrt{-\frac{b}{a}}\right)-4\left(b^{2}f^{4x}\sqrt{-\frac{b}{a}}+2abf^{2x}\sqrt{-\frac{b}{a}}+a^{2}\sqrt{-\frac{b}{a}}\right)\log\left(2bf^{x}+2a\sqrt{-\frac{b}{a}}\right)+4\left(b^{2}f^{4x}\sqrt{-\frac{b}{a}}+2abf^{2x}\sqrt{-\frac{b}{a}}+a^{2}\sqrt{-\frac{b}{a}}\right)\log\left(2bf^{x}-2a\sqrt{-\frac{b}{a}}\right)-3\left(b^{2}f^{4x}x\sqrt{-\frac{b}{a}}\log\left(f\right)+2abf^{2x}x\sqrt{-\frac{b}{a}}\log\left(f\right)+a^{2}x\sqrt{-\frac{b}{a}}\log\left(f\right)\right)\log\left(f^{x}\sqrt{-\frac{b}{a}}+1\right)+3\left(b^{2}f^{4x}x\sqrt{-\frac{b}{a}}\log\left(f\right)+2abf^{2x}x\sqrt{-\frac{b}{a}}\log\left(f\right)+a^{2}x\sqrt{-\frac{b}{a}}\log\left(f\right)\right)\log\left(-f^{x}\sqrt{-\frac{b}{a}}+1\right)}{16\left(a^{2}b^{3}f^{4x}\log\left(f\right)^{2}+2a^{3}b^{2}f^{2x}\log\left(f\right)^{2}+a^{4}b\log\left(f\right)^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^x*x/(a+b*f^(2*x))^3,x, algorithm="fricas")

[Out] 1/16*(2*(3*b^2*x*log(f) - b^2)*f^(3*x) + 2*(5*a*b*x*log(f) - a*b)*f^x + 3*(b^2*f^(4*x)*sqrt(-b/a) + 2*a*b*f^(2*x)*sqrt(-b/a) + a^2*sqrt(-b/a))*dilog(f^x*sqrt(-b/a)) - 3*(b^2*f^(4*x)*sqrt(-b/a) + 2*a*b*f^(2*x)*sqrt(-b/a) + a^2*sqrt(-b/a))*dilog(-f^x*sqrt(-b/a)) - 4*(b^2*f^(4*x)*sqrt(-b/a) + 2*a*b*f^(2*x)*sqrt(-b/a) + a^2*sqrt(-b/a))*log(2*b*f^x + 2*a*sqrt(-b/a)) + 4*(b^2*f^(4*x)*sqrt(-b/a) + 2*a*b*f^(2*x)*sqrt(-b/a) + a^2*sqrt(-b/a))*log(2*b*f^x - 2*a*sqrt(-b/a)) - 3*(b^2*f^(4*x)*x*sqrt(-b/a)*log(f) + 2*a*b*f^(2*x)*x*sqrt(-b/a)*log(f) + a^2*x*sqrt(-b/a)*log(f))*log(f^x*sqrt(-b/a) + 1) + 3*(b^2*

```
f^(4*x)*x*sqrt(-b/a)*log(f) + 2*a*b*f^(2*x)*x*sqrt(-b/a)*log(f) + a^2*x*sqr
t(-b/a)*log(f))*log(-f^x*sqrt(-b/a) + 1))/(a^2*b^3*f^(4*x)*log(f)^2 + 2*a^3
*b^2*f^(2*x)*log(f)^2 + a^4*b*log(f)^2)
```

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

$$\frac{f^{3x}(3bx\log(f)-b)+f^{x}(5ax\log(f)-a)}{8a^4\log(f)^2+16a^3bf^{2x}\log(f)^2+8a^2b^2f^{4x}\log(f)^2}+\frac{\int\left(-\frac{4f^x}{a+bf^{2x}}\right)dx+\int\frac{3f^x x\log(f)}{a+bf^{2x}}\,dx}{8a^2\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**x*x/(a+b*f**(2*x))**3,x)
```

```
[Out] (f**(3*x)*(3*b*x*log(f) - b) + f**x*(5*a*x*log(f) - a))/(8*a**4*log(f)**2 +
 16*a**3*b*f**(2*x)*log(f)**2 + 8*a**2*b**2*f**(4*x)*log(f)**2) + (Integral
(-4*f**x/(a + b*f**(2*x)), x) + Integral(3*f**x*x*log(f)/(a + b*f**(2*x)),
x))/(8*a**2*log(f))
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x/(a+b*f^(2*x))^3,x, algorithm="giac")
```

```
[Out] integrate(f^x*x/(b*f^(2*x) + a)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{f^x\,x}{{\left(a+b\,f^{2\,x}\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f^x*x)/(a + b*f^(2*x))^3,x)
```

```
[Out] int((f^x*x)/(a + b*f^(2*x))^3, x)
```

3.53 $\int \frac{f^x x^2}{\left(a+bf^{2x}\right)^3}\,dx$

Optimal. Leaf size=420

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{4a^{5/2}\sqrt{b}\,\log^3(f)}-\frac{f^x x}{4a^2\left(a+bf^{2x}\right)\log^2(f)}-\frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{a^{5/2}\sqrt{b}\,\log^2(f)}+\frac{f^x x^2}{4a\left(a+bf^{2x}\right)^2\log(f)}+\frac{3f^x x^2}{8a^2\left(a+bf^{2x}\right)\log(f)}$$

```
[Out] -1/4*f^x*x/a^2/(a+b*f^(2*x))/ln(f)^2+1/4*f^x*x^2/a/(a+b*f^(2*x))^2/ln(f)+3/
8*f^x*x^2/a^2/(a+b*f^(2*x))/ln(f)+1/4*arctan(f^x*b^(1/2)/a^(1/2))/a^(5/2)/l
n(f)^3/b^(1/2)-x*arctan(f^x*b^(1/2)/a^(1/2))/a^(5/2)/ln(f)^2/b^(1/2)+3/8*x^
2*arctan(f^x*b^(1/2)/a^(1/2))/a^(5/2)/ln(f)/b^(1/2)+1/2*I*polylog(2,-I*f^x*
b^(1/2)/a^(1/2))/a^(5/2)/ln(f)^3/b^(1/2)-3/8*I*x*polylog(2,-I*f^x*b^(1/2)/a
^(1/2))/a^(5/2)/ln(f)^2/b^(1/2)-1/2*I*polylog(2,I*f^x*b^(1/2)/a^(1/2))/a^(5
/2)/ln(f)^3/b^(1/2)+3/8*I*x*polylog(2,I*f^x*b^(1/2)/a^(1/2))/a^(5/2)/ln(f)^
2/b^(1/2)+3/8*I*polylog(3,-I*f^x*b^(1/2)/a^(1/2))/a^(5/2)/ln(f)^3/b^(1/2)-3
/8*I*polylog(3,I*f^x*b^(1/2)/a^(1/2))/a^(5/2)/ln(f)^3/b^(1/2)
```

Rubi [A]
time = 0.42, antiderivative size = 420, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 12, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.667$, Rules used = {2281, 205, 211, 2277, 14, 2320, 4940, 2438, 12, 5251, 2611, 6724}

$$\frac{i\text{PolyLog}\left(2,-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{5/2}\sqrt{b}\,\log^3(f)}-\frac{i\text{PolyLog}\left(2,\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{5/2}\sqrt{b}\,\log^3(f)}+\frac{3i\text{PolyLog}\left(3,-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\,\log^3(f)}-\frac{3i\text{PolyLog}\left(3,\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\,\log^3(f)}-\frac{3ix\text{PolyLog}\left(2,-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\,\log^2(f)}+\frac{3ix\text{PolyLog}\left(2,\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\,\log^2(f)}+\frac{3x^2\text{ArcTan}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\,\log(f)}+\frac{\text{ArcTan}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{4a^{5/2}\sqrt{b}\,\log^3(f)}-\frac{x\text{ArcTan}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{a^{5/2}\sqrt{b}\,\log^2(f)}+\frac{3x^2f^x}{8a^2\log(f)\left(a+bf^{2x}\right)}-\frac{xf^x}{4a^2\log^2(f)\left(a+bf^{2x}\right)}+\frac{x^2f^x}{4a\log(f)\left(a+bf^{2x}\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f^x*x^2)/(a + b*f^(2*x))^3,x]
```

```
[Out] ArcTan[(Sqrt[b]*f^x)/Sqrt[a]]/(4*a^(5/2)*Sqrt[b]*Log[f]^3) - (f^x*x)/(4*a^2
*(a + b*f^(2*x))*Log[f]^2) - (x*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(a^(5/2)*Sqr
t[b]*Log[f]^2) + (f^x*x^2)/(4*a*(a + b*f^(2*x))^2*Log[f]) + (3*f^x*x^2)/(8*
a^2*(a + b*f^(2*x))*Log[f]) + (3*x^2*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(8*a^(5
/2)*Sqrt[b]*Log[f]) + ((I/2)*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(a^(5/
2)*Sqrt[b]*Log[f]^3) - (((3*I)/8)*x*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])
/(a^(5/2)*Sqrt[b]*Log[f]^2) - ((I/2)*PolyLog[2, (I*Sqrt[b]*f^x)/Sqrt[a]])/(
a^(5/2)*Sqrt[b]*Log[f]^3) + (((3*I)/8)*x*PolyLog[2, (I*Sqrt[b]*f^x)/Sqrt[a]
])/(a^(5/2)*Sqrt[b]*Log[f]^2) + (((3*I)/8)*PolyLog[3, ((-I)*Sqrt[b]*f^x)/Sq
rt[a]])/(a^(5/2)*Sqrt[b]*Log[f]^3) - (((3*I)/8)*PolyLog[3, (I*Sqrt[b]*f^x)/
Sqrt[a]])/(a^(5/2)*Sqrt[b]*Log[f]^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integ
erQ[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denom
inator[p + 1/n] < Denominator[p])
```

Rule 211

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

Rule 2277

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] && !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] && !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

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

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4940

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

Rule 5251

```
Int[ArcTan[(a_.) + (b_.)*(f_)^((c_.) + (d_.)*(x_))]*(x_)^(m_.), x_Symbol] :
> Dist[I/2, Int[x^m*Log[1 - I*a - I*b*f^(c + d*x)], x], x] - Dist[I/2, Int[
x^m*Log[1 + I*a + I*b*f^(c + d*x)], x], x] /; FreeQ[{a, b, c, d, f}, x] &&
IntegerQ[m] && m > 0
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{f^x x^2}{(a+bf^{2x})^3}\,dx = \frac{f^x x^2}{4a\,(a+bf^{2x})^2\log(f)} + \frac{3f^x x^2}{8a^2\,(a+bf^{2x})\log(f)} + \frac{3x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\,\log(f)} - 2\int x\left(\frac{\cdots}{4a\,(a+b\cdots}\right.$$

$$= \frac{f^x x^2}{4a\,(a+bf^{2x})^2\log(f)} + \frac{3f^x x^2}{8a^2\,(a+bf^{2x})\log(f)} + \frac{3x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\,\log(f)} - 2\int\left(\frac{f\cdots}{4a\,(a+bf\cdots}\right.$$

$$= \frac{f^x x^2}{4a\,(a+bf^{2x})^2\log(f)} + \frac{3f^x x^2}{8a^2\,(a+bf^{2x})\log(f)} + \frac{3x^2\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\,\log(f)} - \frac{3\int\frac{f^x x}{a+bf^{2x}}\,dx}{4a^2\log(f)} - \cdots$$

$$= -\frac{f^x x}{4a^2\,(a+bf^{2x})\log^2(f)} - \frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{a^{5/2}\sqrt{b}\,\log^2(f)} + \frac{f^x x^2}{4a\,(a+bf^{2x})^2\log(f)} + \frac{3f^x x^2}{8a^2\,(a+bf^{2x})\log\cdots}$$

$$= -\frac{f^x x}{4a^2\,(a+bf^{2x})\log^2(f)} - \frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{a^{5/2}\sqrt{b}\,\log^2(f)} + \frac{f^x x^2}{4a\,(a+bf^{2x})^2\log(f)} + \frac{3f^x x^2}{8a^2\,(a+bf^{2x})\log\cdots}$$

$$= -\frac{f^x x}{4a^2\,(a+bf^{2x})\log^2(f)} - \frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{a^{5/2}\sqrt{b}\,\log^2(f)} + \frac{f^x x^2}{4a\,(a+bf^{2x})^2\log(f)} + \frac{3f^x x^2}{8a^2\,(a+bf^{2x})\log\cdots}$$

$$= \frac{\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{4a^{5/2}\sqrt{b}\,\log^3(f)} - \frac{f^x x}{4a^2\,(a+bf^{2x})\log^2(f)} - \frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{a^{5/2}\sqrt{b}\,\log^2(f)} + \frac{f^x x^2}{4a\,(a+bf^{2x})^2\log(f)} \cdots$$

$$= \frac{\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{4a^{5/2}\sqrt{b}\,\log^3(f)} - \frac{f^x x}{4a^2\,(a+bf^{2x})\log^2(f)} - \frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{a^{5/2}\sqrt{b}\,\log^2(f)} + \frac{f^x x^2}{4a\,(a+bf^{2x})^2\log(f)} \cdots$$

Mathematica [A]
time = 0.37, size = 353, normalized size = 0.84

$$\frac{\frac{4\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}} + \frac{4af^x x^2\log^2(f)}{(a+bf^{2x})^2} + \frac{2f^x x\log(f)(-2+3x\log(f))}{a+bf^{2x}} - \frac{8i\left(x\log(f)\left(\log\left(1-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)-\log\left(1+\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)\right)-\mathrm{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)+\mathrm{Li}_2\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)\right)}{\sqrt{a}\sqrt{b}} + \frac{3i\left(x^2\log^2(f)\log\left(1-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)-x^2\log^2(f)\log\left(1+\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)-2x\log(f)\mathrm{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)+2x\log(f)\mathrm{Li}_2\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)+2\mathrm{Li}_3\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)-2\mathrm{Li}_3\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)\right)}{\sqrt{a}\sqrt{b}}}{16a^2\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f^x*x^2)/(a + b*f^(2*x))^3,x]
```

```
[Out] ((4*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]) + (4*a*f^x*x^2*Log[f]^
2)/(a + b*f^(2*x))^2 + (2*f^x*x*Log[f]*(-2 + 3*x*Log[f]))/(a + b*f^(2*x)) -
 ((8*I)*(x*Log[f]*(Log[1 - (I*Sqrt[b]*f^x)/Sqrt[a]] - Log[1 + (I*Sqrt[b]*f^
x)/Sqrt[a]]) - PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]] + PolyLog[2, (I*Sqrt[
b]*f^x)/Sqrt[a]]))/(Sqrt[a]*Sqrt[b]) + ((3*I)*(x^2*Log[f]^2*Log[1 - (I*Sqrt
[b]*f^x)/Sqrt[a]] - x^2*Log[f]^2*Log[1 + (I*Sqrt[b]*f^x)/Sqrt[a]] - 2*x*Log
[f]*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]] + 2*x*Log[f]*PolyLog[2, (I*Sqrt[
b]*f^x)/Sqrt[a]] + 2*PolyLog[3, ((-I)*Sqrt[b]*f^x)/Sqrt[a]] - 2*PolyLog[3,
(I*Sqrt[b]*f^x)/Sqrt[a]]))/(Sqrt[a]*Sqrt[b]))/(16*a^2*Log[f]^3)
```

Maple [F]
time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{f^{x} x^{2}}{\left(a +b \,f^{2 x}\right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x*x^2/(a+b*f^(2*x))^3,x)
```

```
[Out] int(f^x*x^2/(a+b*f^(2*x))^3,x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x^2/(a+b*f^(2*x))^3,x, algorithm="maxima")
```

```
[Out] 1/8*((3*b*x^2*log(f) - 2*b*x)*f^(3*x) + (5*a*x^2*log(f) - 2*a*x)*f^x)/(a^2*
b^2*f^(4*x)*log(f)^2 + 2*a^3*b*f^(2*x)*log(f)^2 + a^4*log(f)^2) + integrate
(1/8*(3*x^2*log(f)^2 - 8*x*log(f) + 2)*f^x/(a^2*b*f^(2*x)*log(f)^2 + a^3*lo
g(f)^2), x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 786 vs. 2(298) = 596.
time = 0.43, size = 786, normalized size = 1.87

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x^2/(a+b*f^(2*x))^3,x, algorithm="fricas")
```

```
[Out] 1/16*(2*(3*b^2*x^2*log(f)^2 - 2*b^2*x*log(f))*f^(3*x) + 2*(5*a*b*x^2*log(f)
^2 - 2*a*b*x*log(f))*f^x + 2*((3*b^2*x*log(f) - 4*b^2)*f^(4*x)*sqrt(-b/a) +
```

```
 2*(3*a*b*x*log(f) - 4*a*b)*f^(2*x)*sqrt(-b/a) + (3*a^2*x*log(f) - 4*a^2)*s
qrt(-b/a))*dilog(f^x*sqrt(-b/a)) - 2*((3*b^2*x*log(f) - 4*b^2)*f^(4*x)*sqrt
(-b/a) + 2*(3*a*b*x*log(f) - 4*a*b)*f^(2*x)*sqrt(-b/a) + (3*a^2*x*log(f) -
4*a^2)*sqrt(-b/a))*dilog(-f^x*sqrt(-b/a)) + 2*(b^2*f^(4*x)*sqrt(-b/a) + 2*a
*b*f^(2*x)*sqrt(-b/a) + a^2*sqrt(-b/a))*log(2*b*f^x + 2*a*sqrt(-b/a)) - 2*(
b^2*f^(4*x)*sqrt(-b/a) + 2*a*b*f^(2*x)*sqrt(-b/a) + a^2*sqrt(-b/a))*log(2*b
*f^x - 2*a*sqrt(-b/a)) - ((3*b^2*x^2*log(f)^2 - 8*b^2*x*log(f))*f^(4*x)*sqr
t(-b/a) + 2*(3*a*b*x^2*log(f)^2 - 8*a*b*x*log(f))*f^(2*x)*sqrt(-b/a) + (3*a
^2*x^2*log(f)^2 - 8*a^2*x*log(f))*sqrt(-b/a))*log(f^x*sqrt(-b/a) + 1) + ((3
*b^2*x^2*log(f)^2 - 8*b^2*x*log(f))*f^(4*x)*sqrt(-b/a) + 2*(3*a*b*x^2*log(f
)^2 - 8*a*b*x*log(f))*f^(2*x)*sqrt(-b/a) + (3*a^2*x^2*log(f)^2 - 8*a^2*x*lo
g(f))*sqrt(-b/a))*log(-f^x*sqrt(-b/a) + 1) - 6*(b^2*f^(4*x)*sqrt(-b/a) + 2*
a*b*f^(2*x)*sqrt(-b/a) + a^2*sqrt(-b/a))*polylog(3, f^x*sqrt(-b/a)) + 6*(b^
2*f^(4*x)*sqrt(-b/a) + 2*a*b*f^(2*x)*sqrt(-b/a) + a^2*sqrt(-b/a))*polylog(3
, -f^x*sqrt(-b/a)))/(a^2*b^3*f^(4*x)*log(f)^3 + 2*a^3*b^2*f^(2*x)*log(f)^3
+ a^4*b*log(f)^3)
```

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

$$\frac{f^{3x}(3bx^2\log(f)-2bx)+f^x(5ax^2\log(f)-2ax)}{8a^4\log(f)^2+16a^3bf^{2x}\log(f)^2+8a^2b^2f^{4x}\log(f)^2}+\frac{\int\frac{2f^x}{a+bf^{2x}}\,dx+\int\left(-\frac{8f^xx\log(f)}{a+bf^{2x}}\right)dx+\int\frac{3f^xx^2\log(f)^2}{a+bf^{2x}}\,dx}{8a^2\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**x*x**2/(a+b*f**(2*x))**3,x)
```

```
[Out] (f**(3*x)*(3*b*x**2*log(f) - 2*b*x) + f**x*(5*a*x**2*log(f) - 2*a*x))/(8*a*
*4*log(f)**2 + 16*a**3*b*f**(2*x)*log(f)**2 + 8*a**2*b**2*f**(4*x)*log(f)**
2) + (Integral(2*f**x/(a + b*f**(2*x)), x) + Integral(-8*f**x*x*log(f)/(a +
 b*f**(2*x)), x) + Integral(3*f**x*x**2*log(f)**2/(a + b*f**(2*x)), x))/(8*
a**2*log(f)**2)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x^2/(a+b*f^(2*x))^3,x, algorithm="giac")
```

```
[Out] integrate(f^x*x^2/(b*f^(2*x) + a)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{f^x\,x^2}{{\left(a+b\,f^{2\,x}\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f^x*x^2)/(a + b*f^(2*x))^3,x)
```

```
[Out] int((f^x*x^2)/(a + b*f^(2*x))^3, x)
```

3.54 $\int \frac{1}{bf^{-x}+af^x}\,dx$

Optimal. Leaf size=30

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}$$

```
[Out] arctan(f^x*a^(1/2)/b^(1/2))/ln(f)/a^(1/2)/b^(1/2)
```

Rubi [A]
time = 0.01, antiderivative size = 30, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {2320, 211}

$$\frac{\text{ArcTan}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[(b/f^x + a*f^x)^(-1),x]
```

```
[Out] ArcTan[(Sqrt[a]*f^x)/Sqrt[b]]/(Sqrt[a]*Sqrt[b]*Log[f])
```

Rule 211

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

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{bf^{-x}+af^x}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{b+ax^2}\,dx,x,f^x\right)}{\log(f)}\\ &= \frac{\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}\end{aligned}$$

Mathematica [A]
time = 0.03, size = 30, normalized size = 1.00

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(b/f^x + a*f^x)^(-1),x]
[Out] ArcTan[(Sqrt[a]*f^x)/Sqrt[b]]/(Sqrt[a]*Sqrt[b]*Log[f])
```

Maple [A]
time = 0.02, size = 22, normalized size = 0.73

method	result	size
derivativedivides	$\frac{\arctan\left(\frac{a f^x}{\sqrt{ba}}\right)}{\ln(f)\sqrt{ba}}$	22
default	$\frac{\arctan\left(\frac{a f^x}{\sqrt{ba}}\right)}{\ln(f)\sqrt{ba}}$	22
risch	$-\frac{\ln\left(f^x-\frac{b}{\sqrt{-ba}}\right)}{2\sqrt{-ba}\ln(f)}+\frac{\ln\left(f^x+\frac{b}{\sqrt{-ba}}\right)}{2\sqrt{-ba}\ln(f)}$	53

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b/(f^x)+a*f^x),x,method=_RETURNVERBOSE)
[Out] 1/ln(f)/(b*a)^(1/2)*arctan(a*f^x/(b*a)^(1/2))
```

Maxima [A]
time = 0.49, size = 24, normalized size = 0.80

$$-\frac{\arctan\left(\frac{b}{\sqrt{ab}f^x}\right)}{\sqrt{ab}\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b/(f^x)+a*f^x),x, algorithm="maxima")
[Out] -arctan(b/(sqrt(a*b)*f^x))/(sqrt(a*b)*log(f))
```

Fricas [A]
time = 0.40, size = 86, normalized size = 2.87

$$\left[-\frac{\sqrt{-ab}\log\left(\frac{af^{2x}-2\sqrt{-ab}f^{x}-b}{af^{2x}+b}\right)}{2ab\log\left(f\right)}, -\frac{\sqrt{ab}\arctan\left(\frac{\sqrt{ab}}{af^{x}}\right)}{ab\log\left(f\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b/(f^x)+a*f^x),x, algorithm="fricas")
```

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

Sympy [A]
time = 0.08, size = 26, normalized size = 0.87

$$\frac{\operatorname{RootSum}\left(4z^{2}ab+1, \left(i\mapsto i\log\left(-2ia+f^{-x}\right)\right)\right)}{\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b/(f**x)+a*f**x),x)
```

```
[Out] RootSum(4*_z**2*a*b + 1, Lambda(_i, _i*log(-2*_i*a + f**(-x))))/log(f)
```

Giac [A]
time = 1.84, size = 21, normalized size = 0.70

$$\frac{\arctan\left(\frac{af^{x}}{\sqrt{ab}}\right)}{\sqrt{ab}\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b/(f^x)+a*f^x),x, algorithm="giac")
```

```
[Out] arctan(a*f^x/sqrt(a*b))/(sqrt(a*b)*log(f))
```

Mupad [B]
time = 3.51, size = 21, normalized size = 0.70

$$\frac{\operatorname{atan}\left(\frac{a\,f^{x}}{\sqrt{a\,b}}\right)}{\ln\left(f\right)\,\sqrt{a\,b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b/f^x + a*f^x),x)
```

```
[Out] atan((a*f^x)/(a*b)^(1/2))/(log(f)*(a*b)^(1/2))
```

3.55 $\int \frac{x}{bf^{-x}+af^x}\,dx$

Optimal. Leaf size=110

$$\frac{x\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}-\frac{i\mathrm{Li}_2\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)}+\frac{i\mathrm{Li}_2\left(\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)}$$

```
[Out] x*arctan(f^x*a^(1/2)/b^(1/2))/ln(f)/a^(1/2)/b^(1/2)-1/2*I*polylog(2,-I*f^x*
a^(1/2)/b^(1/2))/ln(f)^2/a^(1/2)/b^(1/2)+1/2*I*polylog(2,I*f^x*a^(1/2)/b^(1
/2))/ln(f)^2/a^(1/2)/b^(1/2)
```

Rubi [A]
time = 0.07, antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.353$, Rules used = {2320, 211, 2298, 12, 4940, 2438}

$$-\frac{i\mathrm{PolyLog}\left(2,-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)}+\frac{i\mathrm{PolyLog}\left(2,\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)}+\frac{x\mathrm{ArcTan}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[x/(b/f^x + a*f^x),x]
```

```
[Out] (x*ArcTan[(Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]) - ((I/2)*PolyLog
[2, ((-I)*Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]^2) + ((I/2)*PolyLo
g[2, (I*Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

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

Rule 2298

```
Int[(x_)^(m_.)/((b_.)*(F_)^(v_) + (a_.)*(F_)^((c_.) + (d_.)*(x_))), x_Symbo
l] :> With[{u = IntHide[1/(a*F^(c + d*x) + b*F^v), x]}, Simp[x^m*u, x] - Di
st[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d}, x] && EqQ[v, -(c +
 d*x)] && GtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

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

Rule 4940

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

Rubi steps

$$\begin{aligned}
\int \frac{x}{bf^{-x}+af^x}\,dx &= \frac{x\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}-\int \frac{\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}\,dx\\
&= \frac{x\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}-\frac{\int \tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)dx}{\sqrt{a}\,\sqrt{b}\,\log(f)}\\
&= \frac{x\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}-\frac{\text{Subst}\left(\int \frac{\tan^{-1}\left(\frac{\sqrt{a}\,x}{\sqrt{b}}\right)}{x}\,dx,x,f^x\right)}{\sqrt{a}\,\sqrt{b}\,\log^2(f)}\\
&= \frac{x\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}-\frac{i\text{Subst}\left(\int \frac{\log\left(1-\frac{i\sqrt{a}\,x}{\sqrt{b}}\right)}{x}\,dx,x,f^x\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)}+\frac{i\text{Subst}\left(\int \frac{\log\left(1+\frac{i\sqrt{a}\,x}{\sqrt{b}}\right)}{x}\,dx,\right.}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)}\\
&= \frac{x\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}-\frac{i\text{Li}_2\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)}+\frac{i\text{Li}_2\left(\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)}
\end{aligned}$$

Mathematica [A]

time = 0.07, size = 108, normalized size = 0.98

$$\frac{i\left(x\log(f)\left(\log\left(1-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)-\log\left(1+\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)\right)-\mathrm{Li}_2\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)+\mathrm{Li}_2\left(\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(b/f^x + a*f^x),x]
```

```
[Out] ((I/2)*(x*Log[f]*(Log[1 - (I*Sqrt[a]*f^x)/Sqrt[b]] - Log[1 + (I*Sqrt[a]*f^x
)/Sqrt[b]]) - PolyLog[2, ((-I)*Sqrt[a]*f^x)/Sqrt[b]] + PolyLog[2, (I*Sqrt[a
]*f^x)/Sqrt[b]]))/(Sqrt[a]*Sqrt[b]*Log[f]^2)
```

Maple [A]
time = 0.03, size = 134, normalized size = 1.22

method	result	size
risch	$\frac{x\ln\left(\frac{-a\,f^{x}+\sqrt{-ba}}{\sqrt{-ba}}\right)}{2\ln(f)\sqrt{-ba}}-\frac{x\ln\left(\frac{a\,f^{x}+\sqrt{-ba}}{\sqrt{-ba}}\right)}{2\ln(f)\sqrt{-ba}}+\frac{\mathrm{dilog}\left(\frac{-a\,f^{x}+\sqrt{-ba}}{\sqrt{-ba}}\right)}{2\ln(f)^{2}\sqrt{-ba}}-\frac{\mathrm{dilog}\left(\frac{a\,f^{x}+\sqrt{-ba}}{\sqrt{-ba}}\right)}{2\ln(f)^{2}\sqrt{-ba}}$	134

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(b/(f^x)+a*f^x),x,method=_RETURNVERBOSE)
```

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

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b/(f^x)+a*f^x),x, algorithm="maxima")
```

```
[Out] integrate(x/(a*f^x + b/f^x), x)
```

Fricas [A]
time = 0.37, size = 112, normalized size = 1.02

$$-\frac{x\sqrt{-\frac{a}{b}}\log\left(f^{x}\sqrt{-\frac{a}{b}}+1\right)\log\left(f\right)-x\sqrt{-\frac{a}{b}}\log\left(-f^{x}\sqrt{-\frac{a}{b}}+1\right)\log\left(f\right)-\sqrt{-\frac{a}{b}}\,\mathrm{Li}_2\left(f^{x}\sqrt{-\frac{a}{b}}\right)+\sqrt{-\frac{a}{b}}\,\mathrm{Li}_2\left(-f^{x}\sqrt{-\frac{a}{b}}\right)}{2\,a\log\left(f\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b/(f^x)+a*f^x),x, algorithm="fricas")
```

```
[Out] -1/2*(x*sqrt(-a/b)*log(f^x*sqrt(-a/b) + 1)*log(f) - x*sqrt(-a/b)*log(-f^x*s
qrt(-a/b) + 1)*log(f) - sqrt(-a/b)*dilog(f^x*sqrt(-a/b)) + sqrt(-a/b)*dilog
(-f^x*sqrt(-a/b)))/(a*log(f)^2)
```

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

$$\int \frac{f^x x}{af^{2x} + b}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b/(f**x)+a*f**x),x)
```

```
[Out] Integral(f**x*x/(a*f**(2*x) + b), x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b/(f^x)+a*f^x),x, algorithm="giac")
```

```
[Out] integrate(x/(a*f^x + b/f^x), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x}{\frac{b}{f^x} + a\, f^x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(b/f^x + a*f^x),x)
```

```
[Out] int(x/(b/f^x + a*f^x), x)
```

3.56 $\int \frac{x^2}{bf^{-x}+af^x}\,dx$

Optimal. Leaf size=184

$$\frac{x^2\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}-\frac{ix\text{Li}_2\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^2(f)}+\frac{ix\text{Li}_2\left(\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^2(f)}+\frac{i\text{Li}_3\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)}-\frac{i\text{Li}_3\left(\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)}$$

```
[Out] x^2*arctan(f^x*a^(1/2)/b^(1/2))/ln(f)/a^(1/2)/b^(1/2)-I*x*polylog(2,-I*f^x*
a^(1/2)/b^(1/2))/ln(f)^2/a^(1/2)/b^(1/2)+I*x*polylog(2,I*f^x*a^(1/2)/b^(1/2
))/ln(f)^2/a^(1/2)/b^(1/2)+I*polylog(3,-I*f^x*a^(1/2)/b^(1/2))/ln(f)^3/a^(1
/2)/b^(1/2)-I*polylog(3,I*f^x*a^(1/2)/b^(1/2))/ln(f)^3/a^(1/2)/b^(1/2)
```

Rubi [A]
time = 0.13, antiderivative size = 184, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.368$, Rules used = {2320, 211, 2298, 12, 5251, 2611, 6724}

$$\frac{i\text{PolyLog}\left(3,-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)}-\frac{i\text{PolyLog}\left(3,\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)}-\frac{ix\text{PolyLog}\left(2,-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^2(f)}+\frac{ix\text{PolyLog}\left(2,\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^2(f)}+\frac{x^2\text{ArcTan}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(b/f^x + a*f^x),x]
```

```
[Out] (x^2*ArcTan[(Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]) - (I*x*PolyLog
[2, ((-I)*Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]^2) + (I*x*PolyLog[
2, (I*Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]^2) + (I*PolyLog[3, ((-
I)*Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]^3) - (I*PolyLog[3, (I*Sqr
t[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

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

Rule 2298

```
Int[(x_)^(m_.)/((b_.)*(F_)^(v_) + (a_.)*(F_)^((c_.) + (d_.)*(x_))), x_Symbo
l] :> With[{u = IntHide[1/(a*F^(c + d*x) + b*F^v), x]}, Simp[x^m*u, x] - Di
st[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d}, x] && EqQ[v, -(c +
```

```
d*x)] && GtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 5251

```
Int[ArcTan[(a_.) + (b_.)*(f_)^((c_.) + (d_.)*(x_))]*(x_)^(m_.), x_Symbol] :
> Dist[I/2, Int[x^m*Log[1 - I*a - I*b*f^(c + d*x)], x], x] - Dist[I/2, Int[
x^m*Log[1 + I*a + I*b*f^(c + d*x)], x], x] /; FreeQ[{a, b, c, d, f}, x] &&
IntegerQ[m] && m > 0
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$
\begin{aligned}
\int \frac{x^2}{bf^{-x}+af^x}\,dx &= \frac{x^2\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - 2\int \frac{x\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}\,dx \\
&= \frac{x^2\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{2\int x\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)dx}{\sqrt{a}\,\sqrt{b}\,\log(f)} \\
&= \frac{x^2\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{i\int x\log\left(1-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)dx}{\sqrt{a}\,\sqrt{b}\,\log(f)} + \frac{i\int x\log\left(1+\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)dx}{\sqrt{a}\,\sqrt{b}\,\log(f)} \\
&= \frac{x^2\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{ix\text{Li}_2\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{ix\text{Li}_2\left(\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{i\int \text{Li}_2\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)dx}{\sqrt{a}\,\sqrt{b}\,\log^2(f)} - \\
&= \frac{x^2\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{ix\text{Li}_2\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{ix\text{Li}_2\left(\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{i\text{Subst}\left(\int \frac{\text{Li}_2\left(-\frac{i\sqrt{a}\,x}{\sqrt{b}}\right)}{x}\right.}{\sqrt{a}\,\sqrt{b}\,\log^3(} \\
&= \frac{x^2\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{ix\text{Li}_2\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{ix\text{Li}_2\left(\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{i\text{Li}_3\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)} - \frac{i\text{Li}}{\sqrt{a}}
\end{aligned}
$$

Mathematica [A]
time = 0.06, size = 168, normalized size = 0.91

$$
\frac{i\left(x^2\log^2(f)\log\left(1-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)-x^2\log^2(f)\log\left(1+\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)-2x\log(f)\text{Li}_2\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)+2x\log(f)\text{Li}_2\left(\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)+2\text{Li}_3\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)-2\text{Li}_3\left(\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)\right)}{2\sqrt{a}\,\sqrt{b}\,\log^3(f)}
$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(b/f^x + a*f^x),x]
```

```
[Out] ((I/2)*(x^2*Log[f]^2*Log[1 - (I*Sqrt[a]*f^x)/Sqrt[b]] - x^2*Log[f]^2*Log[1
+ (I*Sqrt[a]*f^x)/Sqrt[b]] - 2*x*Log[f]*PolyLog[2, ((-I)*Sqrt[a]*f^x)/Sqrt[
b]] + 2*x*Log[f]*PolyLog[2, (I*Sqrt[a]*f^x)/Sqrt[b]] + 2*PolyLog[3, ((-I)*S
qrt[a]*f^x)/Sqrt[b]] - 2*PolyLog[3, (I*Sqrt[a]*f^x)/Sqrt[b]]))/(Sqrt[a]*Sqr
t[b]*Log[f]^3)
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$
\int \frac{x^2}{b\,f^{-x}+a\,f^x}\,dx
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(b/(f^x)+a*f^x),x)
```

```
[Out] int(x^2/(b/(f^x)+a*f^x),x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(x^2/(a*f^x + b/f^x), x)
```

Fricas [A]
time = 0.38, size = 176, normalized size = 0.96

$$-\frac{x^2\sqrt{-\frac{a}{b}}\log\left(f^x\sqrt{-\frac{a}{b}}+1\right)\log(f)^2-x^2\sqrt{-\frac{a}{b}}\log\left(-f^x\sqrt{-\frac{a}{b}}+1\right)\log(f)^2-2x\sqrt{-\frac{a}{b}}\operatorname{Li}_2\left(f^x\sqrt{-\frac{a}{b}}\right)\log(f)+2x\sqrt{-\frac{a}{b}}\operatorname{Li}_2\left(-f^x\sqrt{-\frac{a}{b}}\right)\log(f)+2\sqrt{-\frac{a}{b}}\operatorname{polylog}\left(3,f^x\sqrt{-\frac{a}{b}}\right)-2\sqrt{-\frac{a}{b}}\operatorname{polylog}\left(3,-f^x\sqrt{-\frac{a}{b}}\right)}{2a\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*(x^2*sqrt(-a/b)*log(f^x*sqrt(-a/b) + 1)*log(f)^2 - x^2*sqrt(-a/b)*log(
-f^x*sqrt(-a/b) + 1)*log(f)^2 - 2*x*sqrt(-a/b)*dilog(f^x*sqrt(-a/b))*log(f)
 + 2*x*sqrt(-a/b)*dilog(-f^x*sqrt(-a/b))*log(f) + 2*sqrt(-a/b)*polylog(3, f
^x*sqrt(-a/b)) - 2*sqrt(-a/b)*polylog(3, -f^x*sqrt(-a/b)))/(a*log(f)^3)
```

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

$$\int \frac{f^x x^2}{af^{2x}+b}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(b/(f**x)+a*f**x),x)
```

```
[Out] Integral(f**x*x**2/(a*f**(2*x) + b), x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(x^2/(a*f^x + b/f^x), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{\frac{b}{f^x}+a\,f^x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(b/f^x + a*f^x),x)
```

```
[Out] int(x^2/(b/f^x + a*f^x), x)
```

3.57 $\int \frac{x^3}{bf^{-x}+af^x}\,dx$

Optimal. Leaf size=268

$$\frac{x^3\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}-\frac{3ix^2\text{Li}_2\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)}+\frac{3ix^2\text{Li}_2\left(\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)}+\frac{3ix\text{Li}_3\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)}-\frac{3ix\text{Li}_3\left(\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)}-\frac{3i\text{Li}}{\sqrt{a}}$$

```
[Out] x^3*arctan(f^x*a^(1/2)/b^(1/2))/ln(f)/a^(1/2)/b^(1/2)-3/2*I*x^2*polylog(2,-
I*f^x*a^(1/2)/b^(1/2))/ln(f)^2/a^(1/2)/b^(1/2)+3/2*I*x^2*polylog(2,I*f^x*a^
(1/2)/b^(1/2))/ln(f)^2/a^(1/2)/b^(1/2)+3*I*x*polylog(3,-I*f^x*a^(1/2)/b^(1/
2))/ln(f)^3/a^(1/2)/b^(1/2)-3*I*x*polylog(3,I*f^x*a^(1/2)/b^(1/2))/ln(f)^3/
a^(1/2)/b^(1/2)-3*I*polylog(4,-I*f^x*a^(1/2)/b^(1/2))/ln(f)^4/a^(1/2)/b^(1/
2)+3*I*polylog(4,I*f^x*a^(1/2)/b^(1/2))/ln(f)^4/a^(1/2)/b^(1/2)
```

Rubi [A]
time = 0.17, antiderivative size = 268, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.421$, Rules used = {2320, 211, 2298, 12, 5251, 2611, 6744, 6724}

$$-\frac{3ix^2\text{PolyLog}\left(2,-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)}+\frac{3ix^2\text{PolyLog}\left(2,\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)}-\frac{3i\text{PolyLog}\left(4,-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^4(f)}+\frac{3i\text{PolyLog}\left(4,\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^4(f)}+\frac{3ix\text{PolyLog}\left(3,-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)}-\frac{3ix\text{PolyLog}\left(3,\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)}+\frac{x^3\text{ArcTan}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/(b/f^x + a*f^x),x]
```

```
[Out] (x^3*ArcTan[(Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]) - (((3*I)/2)*x
^2*PolyLog[2, ((-I)*Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]^2) + (((
3*I)/2)*x^2*PolyLog[2, (I*Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]^2)
 + ((3*I)*x*PolyLog[3, ((-I)*Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]
^3) - ((3*I)*x*PolyLog[3, (I*Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]
^3) - ((3*I)*PolyLog[4, ((-I)*Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f
]^4) + ((3*I)*PolyLog[4, (I*Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]^
4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 211

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

Rule 2298

```
Int[(x_)^(m_.)/((b_.)*(F_)^(v_) + (a_.)*(F_)^((c_.) + (d_.)*(x_))), x_Symbo
l] :> With[{u = IntHide[1/(a*F^(c + d*x) + b*F^v), x]}, Simp[x^m*u, x] - Di
st[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d}, x] && EqQ[v, -(c +
 d*x)] && GtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 5251

```
Int[ArcTan[(a_.) + (b_.)*(f_)^((c_.) + (d_.)*(x_))]*(x_)^(m_.), x_Symbol] :
> Dist[I/2, Int[x^m*Log[1 - I*a - I*b*f^(c + d*x)], x], x] - Dist[I/2, Int[
x^m*Log[1 + I*a + I*b*f^(c + d*x)], x], x] /; FreeQ[{a, b, c, d, f}, x] &&
IntegerQ[m] && m > 0
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6744

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Dist[f*(m/(b*c*p*Log[F])), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{x^3}{bf^{-x}+af^x}\,dx = \frac{x^3\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - 3\int \frac{x^2\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}\,dx$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{3\int x^2\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)dx}{\sqrt{a}\,\sqrt{b}\,\log(f)}$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{(3i)\int x^2\log\left(1-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)dx}{2\sqrt{a}\,\sqrt{b}\,\log(f)} + \frac{(3i)\int x^2\log\left(1+\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)dx}{2\sqrt{a}\,\sqrt{b}\,\log(f)}$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{3ix^2\mathrm{Li}_2\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{3ix^2\mathrm{Li}_2\left(\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{(3i)\int x\mathrm{Li}_2\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right.}{\sqrt{a}\,\sqrt{b}\,\log^2(f}$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{3ix^2\mathrm{Li}_2\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{3ix^2\mathrm{Li}_2\left(\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{3ix\mathrm{Li}_3\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)} -$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{3ix^2\mathrm{Li}_2\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{3ix^2\mathrm{Li}_2\left(\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{3ix\mathrm{Li}_3\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)} -$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{3ix^2\mathrm{Li}_2\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{3ix^2\mathrm{Li}_2\left(\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{3ix\mathrm{Li}_3\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)} -$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)} - \frac{3ix^2\mathrm{Li}_2\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{3ix^2\mathrm{Li}_2\left(\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)} + \frac{3ix\mathrm{Li}_3\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log^3(f)} -$$

Mathematica [A]
time = 0.06, size = 224, normalized size = 0.84

$$\frac{i\left(x^3\log^3(f)\log\left(1-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)-x^3\log^3(f)\log\left(1+\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)-3x^2\log^2(f)\mathrm{Li}_2\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)+3x^2\log^2(f)\mathrm{Li}_2\left(\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)+6x\log(f)\mathrm{Li}_3\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)-6x\log(f)\mathrm{Li}_3\left(\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)-6\mathrm{Li}_4\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)+6\mathrm{Li}_4\left(\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)\right)}{2\sqrt{a}\,\sqrt{b}\,\log^4(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/(b/f^x + a*f^x),x]
```

```
[Out] ((I/2)*(x^3*Log[f]^3*Log[1 - (I*Sqrt[a]*f^x)/Sqrt[b]] - x^3*Log[f]^3*Log[1
+ (I*Sqrt[a]*f^x)/Sqrt[b]] - 3*x^2*Log[f]^2*PolyLog[2, ((-I)*Sqrt[a]*f^x)/S
qrt[b]] + 3*x^2*Log[f]^2*PolyLog[2, (I*Sqrt[a]*f^x)/Sqrt[b]] + 6*x*Log[f]*P
olyLog[3, ((-I)*Sqrt[a]*f^x)/Sqrt[b]] - 6*x*Log[f]*PolyLog[3, (I*Sqrt[a]*f^
x)/Sqrt[b]] - 6*PolyLog[4, ((-I)*Sqrt[a]*f^x)/Sqrt[b]] + 6*PolyLog[4, (I*Sq
rt[a]*f^x)/Sqrt[b]]))/(Sqrt[a]*Sqrt[b]*Log[f]^4)
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{x^3}{b\,f^{-x} + a\,f^x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(b/(f^x)+a*f^x),x)
[Out] int(x^3/(b/(f^x)+a*f^x),x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(b/(f^x)+a*f^x),x, algorithm="maxima")
[Out] integrate(x^3/(a*f^x + b/f^x), x)
```

Fricas [A]
time = 0.42, size = 239, normalized size = 0.89

$$-\frac{x^3\sqrt{-\frac{a}{b}}\log\left(f^x\sqrt{-\frac{a}{b}}+1\right)\log(f)^3 - x^3\sqrt{-\frac{a}{b}}\log\left(-f^x\sqrt{-\frac{a}{b}}+1\right)\log(f)^3 - 3x^2\sqrt{-\frac{a}{b}}\,\mathrm{Li}_2\left(f^x\sqrt{-\frac{a}{b}}\right)\log(f)^2 + 3x^2\sqrt{-\frac{a}{b}}\,\mathrm{Li}_2\left(-f^x\sqrt{-\frac{a}{b}}\right)\log(f)^2 + 6x\sqrt{-\frac{a}{b}}\log(f)\,\mathrm{polylog}\left(3, f^x\sqrt{-\frac{a}{b}}\right) - 6x\sqrt{-\frac{a}{b}}\log(f)\,\mathrm{polylog}\left(3, -f^x\sqrt{-\frac{a}{b}}\right) - 6\sqrt{-\frac{a}{b}}\,\mathrm{polylog}\left(4, f^x\sqrt{-\frac{a}{b}}\right) + 6\sqrt{-\frac{a}{b}}\,\mathrm{polylog}\left(4, -f^x\sqrt{-\frac{a}{b}}\right)}{2\,a\log(f)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(b/(f^x)+a*f^x),x, algorithm="fricas")
[Out] -1/2*(x^3*sqrt(-a/b)*log(f^x*sqrt(-a/b) + 1)*log(f)^3 - x^3*sqrt(-a/b)*log(
-f^x*sqrt(-a/b) + 1)*log(f)^3 - 3*x^2*sqrt(-a/b)*dilog(f^x*sqrt(-a/b))*log(
f)^2 + 3*x^2*sqrt(-a/b)*dilog(-f^x*sqrt(-a/b))*log(f)^2 + 6*x*sqrt(-a/b)*lo
g(f)*polylog(3, f^x*sqrt(-a/b)) - 6*x*sqrt(-a/b)*log(f)*polylog(3, -f^x*sqr
t(-a/b)) - 6*sqrt(-a/b)*polylog(4, f^x*sqrt(-a/b)) + 6*sqrt(-a/b)*polylog(4
, -f^x*sqrt(-a/b)))/(a*log(f)^4)
```

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

$$\int \frac{f^x x^3}{af^{2x} + b}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(b/(f**x)+a*f**x),x)
[Out] Integral(f**x*x**3/(a*f**(2*x) + b), x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(b/(f^x)+a*f^x),x, algorithm="giac")
[Out] integrate(x^3/(a*f^x + b/f^x), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3}{\frac{b}{f^x}+a\,f^x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(b/f^x + a*f^x),x)
[Out] int(x^3/(b/f^x + a*f^x), x)
```

3.58 $\int \frac{1}{(bf^{-x}+af^x)^2}\,dx$

Optimal. Leaf size=22

$$-\frac{1}{2a\left(b+af^{2x}\right)\log(f)}$$

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

Rubi [A]
time = 0.01, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {2320, 267}

$$-\frac{1}{2a\log(f)\left(af^{2x}+b\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(b/f^x + a*f^x)^(-2),x]
```

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

Rule 267

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

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

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

Mathematica [A]
time = 0.03, size = 23, normalized size = 1.05

$$-\frac{1}{2ab\log(f)+2a^2f^{2x}\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(b/f^x + a*f^x)^(-2),x]
```

```
[Out] -(2*a*b*Log[f] + 2*a^2*f^(2*x)*Log[f])^(-1)
```

Maple [A]
time = 0.02, size = 21, normalized size = 0.95

method	result	size
derivativedivides	$-\frac{1}{2a(b+a f^{2x})\ln(f)}$	21
default	$-\frac{1}{2a(b+a f^{2x})\ln(f)}$	21
risch	$-\frac{1}{2a(b+a f^{2x})\ln(f)}$	21
norman	$-\frac{1}{2\ln(f)a(a\,\mathrm{e}^{2x\ln(f)}+b)}$	23

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b/(f^x)+a*f^x)^2,x,method=_RETURNVERBOSE)
```

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

Maxima [A]
time = 0.28, size = 23, normalized size = 1.05

$$\frac{1}{2\left(ab+\frac{b^2}{f^{2x}}\right)\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b/(f^x)+a*f^x)^2,x, algorithm="maxima")
```

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

Fricas [A]
time = 0.41, size = 21, normalized size = 0.95

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b/(f^x)+a*f^x)^2,x, algorithm="fricas")
```

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

Sympy [**A**]
time = 0.04, size = 22, normalized size = 1.00

$$\frac{1}{2ab\log\left(f\right)+2b^{2}f^{-2x}\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b/(f**x)+a*f**x)**2,x)
```

```
[Out] 1/(2*a*b*log(f) + 2*b**2*log(f)/f**(2*x))
```

Giac [**A**]
time = 1.44, size = 20, normalized size = 0.91

$$-\frac{1}{2\left(af^{2x}+b\right)a\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b/(f^x)+a*f^x)^2,x, algorithm="giac")
```

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

Mupad [**B**]
time = 3.61, size = 20, normalized size = 0.91

$$-\frac{1}{2\,a\,\ln\left(f\right)\,\left(b+a\,f^{2\,x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b/f^x + a*f^x)^2,x)
```

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

3.59 $\int \frac{x}{(bf^{-x}+af^x)^2} \, dx$

Optimal. Leaf size=63

$$\frac{x}{2ab\log(f)} - \frac{x}{2a\,(b+af^{2x})\log(f)} - \frac{\log\left(b+af^{2x}\right)}{4ab\log^2(f)}$$

```
[Out] 1/2*x/a/b/ln(f)-1/2*x/a/(b+a*f^(2*x))/ln(f)-1/4*ln(b+a*f^(2*x))/a/b/ln(f)^2
```

Rubi [A]
time = 0.05, antiderivative size = 63, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.353$, Rules used = {2321, 2222, 2320, 36, 29, 31}

$$-\frac{\log\left(af^{2x}+b\right)}{4ab\log^2(f)} - \frac{x}{2a\log(f)\left(af^{2x}+b\right)} + \frac{x}{2ab\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[x/(b/f^x + a*f^x)^2,x]
```

```
[Out] x/(2*a*b*Log[f]) - x/(2*a*(b + a*f^(2*x))*Log[f]) - Log[b + a*f^(2*x)]/(4*a
*b*Log[f]^2)
```

Rule 29

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

Rule 31

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

Rule 36

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

Rule 2222

```
Int[((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((a_.) + (b_.)*((F_)^((g_.)*(
(e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :>
 Simp[(c + d*x)^m*((a + b*(F^(g*(e + f*x)))^n)^(p + 1)/(b*f*g*n*(p + 1)*Log
[F])), x] - Dist[d*(m/(b*f*g*n*(p + 1)*Log[F])), Int[(c + d*x)^(m - 1)*(a +
 b*(F^(g*(e + f*x)))^n)^(p + 1), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m
, n, p}, x] && NeQ[p, -1]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2321

```
Int[(u_.)*((a_.)*(F_)^(v_) + (b_.)*(F_)^(w_))^(n_), x_Symbol] :> Int[u*F^(n
*v)*(a + b*F^ExpandToSum[w - v, x])^n, x] /; FreeQ[{F, a, b, n}, x] && ILtQ
[n, 0] && LinearQ[{v, w}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{x}{\left(bf^{-x}+af^{x}\right)^2}\,dx &= \int \frac{f^{2x}x}{\left(b+af^{2x}\right)^2}\,dx\\
&= -\frac{x}{2a\left(b+af^{2x}\right)\log(f)}+\frac{\int \frac{1}{b+af^{2x}}\,dx}{2a\log(f)}\\
&= -\frac{x}{2a\left(b+af^{2x}\right)\log(f)}+\frac{\mathrm{Subst}\left(\int \frac{1}{x(b+ax)}\,dx,x,f^{2x}\right)}{4a\log^2(f)}\\
&= -\frac{x}{2a\left(b+af^{2x}\right)\log(f)}-\frac{\mathrm{Subst}\left(\int \frac{1}{b+ax}\,dx,x,f^{2x}\right)}{4b\log^2(f)}+\frac{\mathrm{Subst}\left(\int \frac{1}{x}\,dx,x,f^{2x}\right)}{4ab\log^2(f)}\\
&= \frac{x}{2ab\log(f)}-\frac{x}{2a\left(b+af^{2x}\right)\log(f)}-\frac{\log\left(b+af^{2x}\right)}{4ab\log^2(f)}
\end{aligned}$$

Mathematica [A]
time = 0.06, size = 48, normalized size = 0.76

$$\frac{\frac{2f^{2x}x\log(f)}{b+af^{2x}}-\frac{\log\left(b+af^{2x}\right)}{a}}{4b\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(b/f^x + a*f^x)^2,x]
```

```
[Out] ((2*f^(2*x)*x*Log[f])/(b + a*f^(2*x)) - Log[b + a*f^(2*x)]/a)/(4*b*Log[f]^2
)
```

Maple [A]
time = 0.02, size = 56, normalized size = 0.89

method	result	size
norman	$\frac{x\,\mathrm{e}^{2x\ln(f)}}{2b\ln(f)\left(a\,\mathrm{e}^{2x\ln(f)}+b\right)}-\frac{\ln\left(a\,\mathrm{e}^{2x\ln(f)}+b\right)}{4\ln(f)^{2}ab}$	56
risch	$\frac{x}{2ab\ln(f)}-\frac{x}{2a(b+a\,f^{2x})\ln(f)}-\frac{\ln\left(f^{2x}+\frac{b}{a}\right)}{4\ln(f)^{2}ab}$	60

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(b/(f^x)+a*f^x)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/b/ln(f)*x*exp(x*ln(f))^2/(a*exp(x*ln(f))^2+b)-1/4/ln(f)^2/a/b*ln(a*exp(
x*ln(f))^2+b)
```

Maxima [A]
time = 0.29, size = 54, normalized size = 0.86

$$\frac{f^{2x}x}{2\left(abf^{2x}\log\left(f\right)+b^{2}\log\left(f\right)\right)}-\frac{\log\left(\frac{af^{2x}+b}{a}\right)}{4\,ab\log\left(f\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*f^(2*x)*x/(a*b*f^(2*x)*log(f) + b^2*log(f)) - 1/4*log((a*f^(2*x) + b)/a
)/(a*b*log(f)^2)
```

Fricas [A]
time = 0.37, size = 61, normalized size = 0.97

$$\frac{2\,af^{2x}x\log\left(f\right)-\left(af^{2x}+b\right)\log\left(af^{2x}+b\right)}{4\left(a^{2}bf^{2x}\log\left(f\right)^{2}+ab^{2}\log\left(f\right)^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*(2*a*f^(2*x)*x*log(f) - (a*f^(2*x) + b)*log(a*f^(2*x) + b))/(a^2*b*f^(2
*x)*log(f)^2 + a*b^2*log(f)^2)
```

Sympy [A]
time = 0.08, size = 54, normalized size = 0.86

$$\frac{x}{2ab\log\left(f\right)+2b^{2}f^{-2x}\log\left(f\right)}-\frac{x}{2ab\log\left(f\right)}-\frac{\log\left(\frac{a}{b}+f^{-2x}\right)}{4ab\log\left(f\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b/(f**x)+a*f**x)**2,x)
```

```
[Out] x/(2*a*b*log(f) + 2*b**2*log(f)/f**(2*x)) - x/(2*a*b*log(f)) - log(a/b + f*
*(-2*x))/(4*a*b*log(f)**2)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(x/(a*f^x + b/f^x)^2, x)
```

Mupad [B]
time = 3.61, size = 51, normalized size = 0.81

$$\frac{f^{2\,x}\,x}{2\,\left(b^2\,\ln\left(f\right)+a\,b\,f^{2\,x}\,\ln\left(f\right)\right)}-\frac{\ln\left(b+a\,f^{2\,x}\right)}{4\,a\,b\,{\ln\left(f\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(b/f^x + a*f^x)^2,x)
```

```
[Out] (f^(2*x)*x)/(2*(b^2*log(f) + a*b*f^(2*x)*log(f))) - log(b + a*f^(2*x))/(4*a
*b*log(f)^2)
```

3.60 $\int \frac{x^2}{(bf^{-x}+af^x)^2}\,dx$

Optimal. Leaf size=98

$$\frac{x^2}{2ab\log(f)}-\frac{x^2}{2a\,(b+af^{2x})\log(f)}-\frac{x\log\left(1+\frac{af^{2x}}{b}\right)}{2ab\log^2(f)}-\frac{\mathrm{Li}_2\left(-\frac{af^{2x}}{b}\right)}{4ab\log^3(f)}$$

```
[Out] 1/2*x^2/a/b/ln(f)-1/2*x^2/a/(b+a*f^(2*x))/ln(f)-1/2*x*ln(1+a*f^(2*x)/b)/a/b
/ln(f)^2-1/4*polylog(2,-a*f^(2*x)/b)/a/b/ln(f)^3
```

Rubi [A]

time = 0.12, antiderivative size = 98, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.316$, Rules used = {2321, 2222, 2215, 2221, 2317, 2438}

$$-\frac{\text{PolyLog}\left(2,-\frac{af^{2x}}{b}\right)}{4ab\log^3(f)}-\frac{x^2}{2a\log(f)\,(af^{2x}+b)}-\frac{x\log\left(\frac{af^{2x}}{b}+1\right)}{2ab\log^2(f)}+\frac{x^2}{2ab\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(b/f^x + a*f^x)^2,x]
```

```
[Out] x^2/(2*a*b*Log[f]) - x^2/(2*a*(b + a*f^(2*x))*Log[f]) - (x*Log[1 + (a*f^(2*
x))/b])/(2*a*b*Log[f]^2) - PolyLog[2, -((a*f^(2*x))/b)]/(4*a*b*Log[f]^3)
```

Rule 2215

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[(c + d*x)^m*((F^(g*(e + f*x)))^n/(a + b*(F^(g*(e + f*x)))^n)), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2222

```
Int[((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((a_.) + (b_.)*((F_)^((g_.)*(
(e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :>
 Simp[(c + d*x)^m*((a + b*(F^(g*(e + f*x)))^n)^(p + 1)/(b*f*g*n*(p + 1)*Log
[F])), x] - Dist[d*(m/(b*f*g*n*(p + 1)*Log[F])), Int[(c + d*x)^(m - 1)*(a +
```

```
 b*(F^(g*(e + f*x)))^n)^(p + 1), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m
, n, p}, x] && NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2321

```
Int[(u_.)*((a_.)*(F_)^(v_) + (b_.)*(F_)^(w_))^(n_), x_Symbol] :> Int[u*F^(n
*v)*(a + b*F^ExpandToSum[w - v, x])^n, x] /; FreeQ[{F, a, b, n}, x] && ILtQ
[n, 0] && LinearQ[{v, w}, x]
```

Rule 2438

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

Rubi steps

$$\begin{aligned}
\int \frac{x^2}{\left(bf^{-x}+af^x\right)^2}\,dx &= \int \frac{f^{2x}x^2}{\left(b+af^{2x}\right)^2}\,dx\\
&= -\frac{x^2}{2a\left(b+af^{2x}\right)\log(f)}+\frac{\int \frac{x}{b+af^{2x}}\,dx}{a\log(f)}\\
&= \frac{x^2}{2ab\log(f)}-\frac{x^2}{2a\left(b+af^{2x}\right)\log(f)}-\frac{\int \frac{f^{2x}x}{b+af^{2x}}\,dx}{b\log(f)}\\
&= \frac{x^2}{2ab\log(f)}-\frac{x^2}{2a\left(b+af^{2x}\right)\log(f)}-\frac{x\log\left(1+\frac{af^{2x}}{b}\right)}{2ab\log^2(f)}+\frac{\int \log\left(1+\frac{af^{2x}}{b}\right)\,dx}{2ab\log^2(f)}\\
&= \frac{x^2}{2ab\log(f)}-\frac{x^2}{2a\left(b+af^{2x}\right)\log(f)}-\frac{x\log\left(1+\frac{af^{2x}}{b}\right)}{2ab\log^2(f)}+\frac{\mathrm{Subst}\left(\int \frac{\log\left(1+\frac{ax}{b}\right)}{x}\,dx,x,f^{2x}\right)}{4ab\log^3(f)}\\
&= \frac{x^2}{2ab\log(f)}-\frac{x^2}{2a\left(b+af^{2x}\right)\log(f)}-\frac{x\log\left(1+\frac{af^{2x}}{b}\right)}{2ab\log^2(f)}-\frac{\mathrm{Li}_2\left(-\frac{af^{2x}}{b}\right)}{4ab\log^3(f)}
\end{aligned}$$

Mathematica [A]
time = 0.07, size = 90, normalized size = 0.92

$$\frac{2x\log(f)\left(af^{2x}x\log(f)-\left(b+af^{2x}\right)\log\left(1+\frac{af^{2x}}{b}\right)\right)-\left(b+af^{2x}\right)\mathrm{Li}_2\left(-\frac{af^{2x}}{b}\right)}{4ab\left(b+af^{2x}\right)\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(b/f^x + a*f^x)^2,x]
```

```
[Out] (2*x*Log[f]*(a*f^(2*x)*x*Log[f] - (b + a*f^(2*x))*Log[1 + (a*f^(2*x))/b]) -
 (b + a*f^(2*x))*PolyLog[2, -((a*f^(2*x))/b)])/(4*a*b*(b + a*f^(2*x))*Log[f
]^3)
```

Maple [A]
time = 0.03, size = 91, normalized size = 0.93

method	result	size
risch	$\frac{x^{2}}{2 a b \ln \left(f \right)}-\frac{x^{2}}{2 a \left(b +a \,f^{2 x}\right) \ln \left(f \right)}-\frac{x \ln \left(1+\frac{a \,f^{2 x}}{b}\right)}{2 a b \ln \left(f \right)^{2}}-\frac{\operatorname{polylog}\left(2, -\frac{a \,f^{2 x}}{b}\right)}{4 a b \ln \left(f \right)^{3}}$	91

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(b/(f^x)+a*f^x)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2/ln(f)*x^2/a/(a*(f^x)^2+b)+1/2*x^2/a/b/ln(f)-1/2*x*ln(1+a*f^(2*x)/b)/a/
b/ln(f)^2-1/4*polylog(2,-a*f^(2*x)/b)/a/b/ln(f)^3
```

Maxima [A]
time = 0.29, size = 83, normalized size = 0.85

$$-\frac{x^{2}}{2\left(a^{2} f^{2 x} \log\left(f\right)+a b \log\left(f\right)\right)}+\frac{x^{2}}{2 a b \log\left(f\right)}-\frac{2 x \log\left(\frac{a f^{2 x}}{b}+1\right) \log\left(f\right)+\operatorname{Li}_{2}\left(-\frac{a f^{2 x}}{b}\right)}{4 a b \log\left(f\right)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*x^2/(a^2*f^(2*x)*log(f) + a*b*log(f)) + 1/2*x^2/(a*b*log(f)) - 1/4*(2*
x*log(a*f^(2*x)/b + 1)*log(f) + dilog(-a*f^(2*x)/b))/(a*b*log(f)^3)
```

Fricas [A]
time = 0.39, size = 159, normalized size = 1.62

$$\frac{a f^{2 x} x^{2} \log\left(f\right)^{2}-\left(a f^{2 x}+b\right) \operatorname{Li}_{2}\left(f^{x} \sqrt{-\frac{a}{b}}\right)-\left(a f^{2 x}+b\right) \operatorname{Li}_{2}\left(-f^{x} \sqrt{-\frac{a}{b}}\right)-\left(a f^{2 x} x \log\left(f\right)+b x \log\left(f\right)\right) \log\left(f^{x} \sqrt{-\frac{a}{b}}+1\right)-\left(a f^{2 x} x \log\left(f\right)+b x \log\left(f\right)\right) \log\left(-f^{x} \sqrt{-\frac{a}{b}}+1\right)}{2\left(a^{2} b f^{2 x} \log\left(f\right)^{3}+a b^{2} \log\left(f\right)^{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*(a*f^(2*x)*x^2*log(f)^2 - (a*f^(2*x) + b)*dilog(f^x*sqrt(-a/b)) - (a*f^
(2*x) + b)*dilog(-f^x*sqrt(-a/b)) - (a*f^(2*x)*x*log(f) + b*x*log(f))*log(f
^x*sqrt(-a/b) + 1) - (a*f^(2*x)*x*log(f) + b*x*log(f))*log(-f^x*sqrt(-a/b)
+ 1))/(a^2*b*f^(2*x)*log(f)^3 + a*b^2*log(f)^3)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{x^2}{2ab\log(f) + 2b^2f^{-2x}\log(f)} - \frac{\int \frac{f^{2x}x}{af^{2x}+b}\,dx}{b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(b/(f**x)+a*f**x)**2,x)
```

```
[Out] x**2/(2*a*b*log(f) + 2*b**2*log(f)/f**(2*x)) - Integral(f**(2*x)*x/(a*f**(2
*x) + b), x)/(b*log(f))
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(x^2/(a*f^x + b/f^x)^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{\left(\frac{b}{f^x} + a\,f^x\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(b/f^x + a*f^x)^2,x)
```

```
[Out] int(x^2/(b/f^x + a*f^x)^2, x)
```

3.61 $\int \frac{x^3}{(bf^{-x}+af^x)^2}\,dx$

Optimal. Leaf size=128

$$\frac{x^3}{2ab\log(f)}-\frac{x^3}{2a\left(b+af^{2x}\right)\log(f)}-\frac{3x^2\log\left(1+\frac{af^{2x}}{b}\right)}{4ab\log^2(f)}-\frac{3x\text{Li}_2\left(-\frac{af^{2x}}{b}\right)}{4ab\log^3(f)}+\frac{3\text{Li}_3\left(-\frac{af^{2x}}{b}\right)}{8ab\log^4(f)}$$

```
[Out] 1/2*x^3/a/b/ln(f)-1/2*x^3/a/(b+a*f^(2*x))/ln(f)-3/4*x^2*ln(1+a*f^(2*x)/b)/a
/b/ln(f)^2-3/4*x*polylog(2,-a*f^(2*x)/b)/a/b/ln(f)^3+3/8*polylog(3,-a*f^(2*
x)/b)/a/b/ln(f)^4
```

Rubi [A]
time = 0.16, antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.368$, Rules used = {2321, 2222, 2215, 2221, 2611, 2320, 6724}

$$\frac{3\text{PolyLog}\left(3,-\frac{af^{2x}}{b}\right)}{8ab\log^4(f)}-\frac{3x\text{PolyLog}\left(2,-\frac{af^{2x}}{b}\right)}{4ab\log^3(f)}-\frac{x^3}{2a\log(f)\left(af^{2x}+b\right)}-\frac{3x^2\log\left(\frac{af^{2x}}{b}+1\right)}{4ab\log^2(f)}+\frac{x^3}{2ab\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/(b/f^x + a*f^x)^2,x]
```

```
[Out] x^3/(2*a*b*Log[f]) - x^3/(2*a*(b + a*f^(2*x))*Log[f]) - (3*x^2*Log[1 + (a*f
^(2*x))/b])/(4*a*b*Log[f]^2) - (3*x*PolyLog[2, -((a*f^(2*x))/b)])/(4*a*b*Lo
g[f]^3) + (3*PolyLog[3, -((a*f^(2*x))/b)])/(8*a*b*Log[f]^4)
```

Rule 2215

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[(c + d*x)^m*((F^(g*(e + f*x)))^n/(a + b*(F^(g*(e + f*x)))^n)), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2222

```
Int[((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((a_.) + (b_.)*((F_)^((g_.)*(
(e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :>
```

```
 Simp[(c + d*x)^m*((a + b*(F^(g*(e + f*x)))^n)^(p + 1)/(b*f*g*n*(p + 1)*Log
[F])), x] - Dist[d*(m/(b*f*g*n*(p + 1)*Log[F])), Int[(c + d*x)^(m - 1)*(a +
 b*(F^(g*(e + f*x)))^n)^(p + 1), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m
, n, p}, x] && NeQ[p, -1]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2321

```
Int[(u_.)*((a_.)*(F_)^(v_) + (b_.)*(F_)^(w_))^(n_), x_Symbol] :> Int[u*F^(n
*v)*(a + b*F^ExpandToSum[w - v, x])^n, x] /; FreeQ[{F, a, b, n}, x] && ILtQ
[n, 0] && LinearQ[{v, w}, x]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^3}{(bf^{-x}+af^x)^2}\,dx = \int \frac{f^{2x}x^3}{(b+af^{2x})^2}\,dx$$
$$= -\frac{x^3}{2a(b+af^{2x})\log(f)} + \frac{3\int \frac{x^2}{b+af^{2x}}\,dx}{2a\log(f)}$$
$$= \frac{x^3}{2ab\log(f)} - \frac{x^3}{2a(b+af^{2x})\log(f)} - \frac{3\int \frac{f^{2x}x^2}{b+af^{2x}}\,dx}{2b\log(f)}$$
$$= \frac{x^3}{2ab\log(f)} - \frac{x^3}{2a(b+af^{2x})\log(f)} - \frac{3x^2\log\left(1+\frac{af^{2x}}{b}\right)}{4ab\log^2(f)} + \frac{3\int x\log\left(1+\frac{af^{2x}}{b}\right)\,dx}{2ab\log^2(f)}$$
$$= \frac{x^3}{2ab\log(f)} - \frac{x^3}{2a(b+af^{2x})\log(f)} - \frac{3x^2\log\left(1+\frac{af^{2x}}{b}\right)}{4ab\log^2(f)} - \frac{3x\mathrm{Li}_2\left(-\frac{af^{2x}}{b}\right)}{4ab\log^3(f)} + \frac{3\int \mathrm{Li}_2(\cdot}{4ab\,\mathrm{l}}$$
$$= \frac{x^3}{2ab\log(f)} - \frac{x^3}{2a(b+af^{2x})\log(f)} - \frac{3x^2\log\left(1+\frac{af^{2x}}{b}\right)}{4ab\log^2(f)} - \frac{3x\mathrm{Li}_2\left(-\frac{af^{2x}}{b}\right)}{4ab\log^3(f)} + \frac{3\mathrm{Subst}(}{}$$
$$= \frac{x^3}{2ab\log(f)} - \frac{x^3}{2a(b+af^{2x})\log(f)} - \frac{3x^2\log\left(1+\frac{af^{2x}}{b}\right)}{4ab\log^2(f)} - \frac{3x\mathrm{Li}_2\left(-\frac{af^{2x}}{b}\right)}{4ab\log^3(f)} + \frac{3\mathrm{Li}_3\left(-\frac{a}{}\right.}{8ab\log^4}$$

Mathematica [A]
time = 0.08, size = 124, normalized size = 0.97

$$-\frac{x^3}{2a(b+af^{2x})\log(f)} + \frac{3\left(\frac{x^3}{3b} - \frac{x^2\log\left(1+\frac{af^{2x}}{b}\right)}{2b\log(f)} - \frac{x\mathrm{Li}_2\left(-\frac{af^{2x}}{b}\right)}{2b\log^2(f)} + \frac{\mathrm{Li}_3\left(-\frac{af^{2x}}{b}\right)}{4b\log^3(f)}\right)}{2a\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/(b/f^x + a*f^x)^2,x]
```

```
[Out] -1/2*x^3/(a*(b + a*f^(2*x))*Log[f]) + (3*(x^3/(3*b) - (x^2*Log[1 + (a*f^(2*
x))/b])/(2*b*Log[f]) - (x*PolyLog[2, -((a*f^(2*x))/b)])/(2*b*Log[f]^2) + Po
lyLog[3, -((a*f^(2*x))/b)]/(4*b*Log[f]^3)))/(2*a*Log[f])
```

Maple [A]
time = 0.03, size = 119, normalized size = 0.93

method	result	size
risch	$\frac{x^3}{2ab\ln(f)} - \frac{x^3}{2a(b+a\,f^{2x})\ln(f)} - \frac{3x^2\ln\left(1+\frac{a\,f^{2x}}{b}\right)}{4ab\ln(f)^2} - \frac{3x\,\mathrm{polylog}\left(2,-\frac{a\,f^{2x}}{b}\right)}{4ab\ln(f)^3} + \frac{3\,\mathrm{polylog}\left(3,-\frac{a\,f^{2x}}{b}\right)}{8ab\ln(f)^4}$	119

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(b/(f^x)+a*f^x)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2/ln(f)*x^3/a/(a*(f^x)^2+b)+1/2*x^3/a/b/ln(f)-3/4*x^2*ln(1+a*f^(2*x)/b)/
a/b/ln(f)^2-3/4*x*polylog(2,-a*f^(2*x)/b)/a/b/ln(f)^3+3/8*polylog(3,-a*f^(2
*x)/b)/a/b/ln(f)^4
```

Maxima [A]
time = 0.29, size = 107, normalized size = 0.84

$$-\frac{x^3}{2\left(a^2 f^{2x}\log\left(f\right) + ab\log\left(f\right)\right)} + \frac{x^3}{2\,ab\log\left(f\right)} - \frac{3\left(2\,x^2\log\left(\frac{af^{2\,x}}{b} + 1\right)\log\left(f\right)^2 + 2\,x\mathrm{Li}_2\left(-\frac{af^{2\,x}}{b}\right)\log\left(f\right) - \mathrm{Li}_3\left(-\frac{af^{2\,x}}{b}\right)\right)}{8\,ab\log\left(f\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(b/(f^x)+a*f^x)^2,x, algorithm="maxima")
```

```
[Out] -1/2*x^3/(a^2*f^(2*x)*log(f) + a*b*log(f)) + 1/2*x^3/(a*b*log(f)) - 3/8*(2*
x^2*log(a*f^(2*x)/b + 1)*log(f)^2 + 2*x*dilog(-a*f^(2*x)/b)*log(f) - polylo
g(3, -a*f^(2*x)/b))/(a*b*log(f)^4)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 241 vs. 2(117) = 234.
time = 0.35, size = 241, normalized size = 1.88

$$\frac{2\,af^{2\,x}x^3\log\left(f\right)^3 - 6\left(af^{2\,x}x\log\left(f\right) + bx\log\left(f\right)\right)\mathrm{Li}_2\left(f^x\sqrt{-\frac{a}{b}}\right) - 6\left(af^{2\,x}x\log\left(f\right) + bx\log\left(f\right)\right)\mathrm{Li}_2\left(-f^x\sqrt{-\frac{a}{b}}\right) - 3\left(af^{2\,x}x^2\log\left(f\right)^2 + bx^2\log\left(f\right)^2\right)\log\left(f^x\sqrt{-\frac{a}{b}} + 1\right) - 3\left(af^{2\,x}x^2\log\left(f\right)^2 + bx^2\log\left(f\right)^2\right)\log\left(-f^x\sqrt{-\frac{a}{b}} + 1\right) + 6\left(af^{2\,x} + b\right)\mathrm{polylog}\left(3, f^x\sqrt{-\frac{a}{b}}\right) + 6\left(af^{2\,x} + b\right)\mathrm{polylog}\left(3, -f^x\sqrt{-\frac{a}{b}}\right)}{4\left(a^2bf^{2\,x}\log\left(f\right)^4 + ab^2\log\left(f\right)^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(b/(f^x)+a*f^x)^2,x, algorithm="fricas")
```

```
[Out] 1/4*(2*a*f^(2*x)*x^3*log(f)^3 - 6*(a*f^(2*x)*x*log(f) + b*x*log(f))*dilog(f
^x*sqrt(-a/b)) - 6*(a*f^(2*x)*x*log(f) + b*x*log(f))*dilog(-f^x*sqrt(-a/b))
 - 3*(a*f^(2*x)*x^2*log(f)^2 + b*x^2*log(f)^2)*log(f^x*sqrt(-a/b) + 1) - 3*
(a*f^(2*x)*x^2*log(f)^2 + b*x^2*log(f)^2)*log(-f^x*sqrt(-a/b) + 1) + 6*(a*f
^(2*x) + b)*polylog(3, f^x*sqrt(-a/b)) + 6*(a*f^(2*x) + b)*polylog(3, -f^x*
sqrt(-a/b)))/(a^2*b*f^(2*x)*log(f)^4 + a*b^2*log(f)^4)
```

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

$$\frac{x^3}{2ab\log\left(f\right) + 2b^2 f^{-2x}\log\left(f\right)} - \frac{3\int\frac{f^{2x}x^2}{af^{2x}+b}\,dx}{2b\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(b/(f**x)+a*f**x)**2,x)
```

```
[Out] x**3/(2*a*b*log(f) + 2*b**2*log(f)/f**(2*x)) - 3*Integral(f**(2*x)*x**2/(a*
f**(2*x) + b), x)/(2*b*log(f))
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(b/(f^x)+a*f^x)^2,x, algorithm="giac")
```

```
[Out] integrate(x^3/(a*f^x + b/f^x)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3}{{\left(\frac{b}{f^x}+a\,f^x\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(b/f^x + a*f^x)^2,x)
```

```
[Out] int(x^3/(b/f^x + a*f^x)^2, x)
```

3.62 $\int \frac{1}{(bf^{-x}+af^x)^3}\,dx$

Optimal. Leaf size=87

$$-\frac{f^x}{4a\,(b+af^{2x})^2\log(f)}+\frac{f^x}{8ab\,(b+af^{2x})\log(f)}+\frac{\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)}$$

```
[Out] -1/4*f^x/a/(b+a*f^(2*x))^2/ln(f)+1/8*f^x/a/b/(b+a*f^(2*x))/ln(f)+1/8*arctan
(f^x*a^(1/2)/b^(1/2))/a^(3/2)/b^(3/2)/ln(f)
```

Rubi [A]
time = 0.03, antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$, Rules used = {2320, 294, 205, 211}

$$\frac{\text{ArcTan}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)}+\frac{f^x}{8ab\log(f)\,(af^{2x}+b)}-\frac{f^x}{4a\log(f)\,(af^{2x}+b)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(b/f^x + a*f^x)^(-3),x]
```

```
[Out] -1/4*f^x/(a*(b + a*f^(2*x))^2*Log[f]) + f^x/(8*a*b*(b + a*f^(2*x))*Log[f])
+ ArcTan[(Sqrt[a]*f^x)/Sqrt[b]]/(8*a^(3/2)*b^(3/2)*Log[f])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integ
erQ[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denom
inator[p + 1/n] < Denominator[p])
```

Rule 211

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

Rule 294

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

```
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{(bf^{-x}+af^x)^3}\,dx &= \frac{\text{Subst}\left(\int \frac{x^2}{(b+ax^2)^3}\,dx, x, f^x\right)}{\log(f)}\\ &= -\frac{f^x}{4a(b+af^{2x})^2\log(f)}+\frac{\text{Subst}\left(\int \frac{1}{(b+ax^2)^2}\,dx, x, f^x\right)}{4a\log(f)}\\ &= -\frac{f^x}{4a(b+af^{2x})^2\log(f)}+\frac{f^x}{8ab(b+af^{2x})\log(f)}+\frac{\text{Subst}\left(\int \frac{1}{b+ax^2}\,dx, x, f^x\right)}{8ab\log(f)}\\ &= -\frac{f^x}{4a(b+af^{2x})^2\log(f)}+\frac{f^x}{8ab(b+af^{2x})\log(f)}+\frac{\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)}\end{aligned}$$

Mathematica [A]
time = 0.59, size = 70, normalized size = 0.80

$$\frac{\frac{\sqrt{a}\sqrt{b}\,f^x(-b+af^{2x})}{(b+af^{2x})^2}+\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(b/f^x + a*f^x)^(-3),x]
```

```
[Out] ((Sqrt[a]*Sqrt[b]*f^x*(-b + a*f^(2*x)))/(b + a*f^(2*x))^2 + ArcTan[(Sqrt[a]
*f^x)/Sqrt[b]])/(8*a^(3/2)*b^(3/2)*Log[f])
```

Maple [A]
time = 0.05, size = 62, normalized size = 0.71

method	result	size

derivativedivides	$\frac{\frac{\frac{f^{3x}}{8b}-\frac{f^{x}}{8a}}{\left(b+a\,f^{2x}\right)^{2}}+\frac{\arctan\left(\frac{a\,f^{x}}{\sqrt{ba}}\right)}{8ba\sqrt{ba}}}{\ln\left(f\right)}$	62
default	$\frac{\frac{\frac{f^{3x}}{8b}-\frac{f^{x}}{8a}}{\left(b+a\,f^{2x}\right)^{2}}+\frac{\arctan\left(\frac{a\,f^{x}}{\sqrt{ba}}\right)}{8ba\sqrt{ba}}}{\ln\left(f\right)}$	62
risch	$\frac{f^{x}\left(a\,f^{2x}-b\right)}{8\ln\left(f\right)ba\left(b+a\,f^{2x}\right)^{2}}-\frac{\ln\left(f^{x}-\frac{b}{\sqrt{-ba}}\right)}{16\sqrt{-ba}\,ba\ln\left(f\right)}+\frac{\ln\left(f^{x}+\frac{b}{\sqrt{-ba}}\right)}{16\sqrt{-ba}\,ba\ln\left(f\right)}$	102

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b/(f^x)+a*f^x)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/ln(f)*((1/8/b*(f^x)^3-1/8/a*f^x)/(a*(f^x)^2+b)^2+1/8/b/a/(b*a)^(1/2)*arct
an(a*f^x/(b*a)^(1/2)))
```

Maxima [A]
time = 0.48, size = 90, normalized size = 1.03

$$-\frac{\frac{b}{f^{3\,x}}-\frac{a}{f^{x}}}{8\left(a^{3}b+\frac{ab^{3}}{f^{4\,x}}+\frac{2\,a^{2}b^{2}}{f^{2\,x}}\right)\log\left(f\right)}-\frac{\arctan\left(\frac{b}{\sqrt{ab}\,f^{x}}\right)}{8\,\sqrt{ab}\,ab\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b/(f^x)+a*f^x)^3,x, algorithm="maxima")
```

```
[Out] -1/8*(b/f^(3*x) - a/f^x)/((a^3*b + a*b^3/f^(4*x) + 2*a^2*b^2/f^(2*x))*log(f
)) - 1/8*arctan(b/(sqrt(a*b)*f^x))/(sqrt(a*b)*a*b*log(f))
```

Fricas [A]
time = 0.39, size = 261, normalized size = 3.00

$$\left[\frac{2\,a^{2}bf^{3\,x}-2\,ab^{2}f^{x}-\left(\sqrt{-ab}\,a^{2}f^{4\,x}+2\,\sqrt{-ab}\,abf^{2\,x}+\sqrt{-ab}\,b^{2}\right)\log\left(\frac{af^{2\,x}-2\,\sqrt{-ab}\,f^{x}-b}{af^{2\,x}+b}\right)}{16\,\left(a^{4}b^{2}f^{4\,x}\log\left(f\right)+2\,a^{3}b^{3}f^{2\,x}\log\left(f\right)+a^{2}b^{4}\log\left(f\right)\right)},\ \frac{a^{2}bf^{3\,x}-ab^{2}f^{x}-\left(\sqrt{ab}\,a^{2}f^{4\,x}+2\,\sqrt{ab}\,abf^{2\,x}+\sqrt{ab}\,b^{2}\right)\arctan\left(\frac{\sqrt{ab}}{af^{x}}\right)}{8\,\left(a^{4}b^{2}f^{4\,x}\log\left(f\right)+2\,a^{3}b^{3}f^{2\,x}\log\left(f\right)+a^{2}b^{4}\log\left(f\right)\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b/(f^x)+a*f^x)^3,x, algorithm="fricas")
```

```
[Out] [1/16*(2*a^2*b*f^(3*x) - 2*a*b^2*f^x - (sqrt(-a*b)*a^2*f^(4*x) + 2*sqrt(-a*
b)*a*b*f^(2*x) + sqrt(-a*b)*b^2)*log((a*f^(2*x) - 2*sqrt(-a*b)*f^x - b)/(a*
f^(2*x) + b)))/(a^4*b^2*f^(4*x)*log(f) + 2*a^3*b^3*f^(2*x)*log(f) + a^2*b^4
*log(f)), 1/8*(a^2*b*f^(3*x) - a*b^2*f^x - (sqrt(a*b)*a^2*f^(4*x) + 2*sqrt(
```

```
a*b)*a*b*f^(2*x) + sqrt(a*b)*b^2)*arctan(sqrt(a*b)/(a*f^x)))/(a^4*b^2*f^(4*
x)*log(f) + 2*a^3*b^3*f^(2*x)*log(f) + a^2*b^4*log(f))]
```

Sympy [A]
time = 0.13, size = 87, normalized size = 1.00

$$\frac{af^{-x} - bf^{-3x}}{8a^3b\log(f) + 16a^2b^2f^{-2x}\log(f) + 8ab^3f^{-4x}\log(f)} + \frac{\operatorname{RootSum}\left(256z^2a^3b^3 + 1, \left(i \mapsto i\log\left(-16ia^2b + f^{-x}\right)\right)\right)}{\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b/(f**x)+a*f**x)**3,x)
```

```
[Out] (a/f**x - b/f**(3*x))/(8*a**3*b*log(f) + 16*a**2*b**2*log(f)/f**(2*x) + 8*a
*b**3*log(f)/f**(4*x)) + RootSum(256*_z**2*a**3*b**3 + 1, Lambda(_i, _i*log
(-16*_i*a**2*b + f**(-x))))/log(f)
```

Giac [A]
time = 3.05, size = 66, normalized size = 0.76

$$\frac{\arctan\left(\frac{af^x}{\sqrt{ab}}\right)}{8\sqrt{ab}\,ab\log(f)} + \frac{af^{3x} - bf^x}{8\left(af^{2x} + b\right)^2 ab\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b/(f^x)+a*f^x)^3,x, algorithm="giac")
```

```
[Out] 1/8*arctan(a*f^x/sqrt(a*b))/(sqrt(a*b)*a*b*log(f)) + 1/8*(a*f^(3*x) - b*f^x
)/((a*f^(2*x) + b)^2*a*b*log(f))
```

Mupad [B]
time = 3.64, size = 113, normalized size = 1.30

$$\frac{f^x}{8\,\left(a\,b^2\,\ln(f) + a^2\,b\,f^{2\,x}\,\ln(f)\right)} - \frac{f^x}{4\,\left(a\,b^2\,\ln(f) + a^3\,f^{4\,x}\,\ln(f) + 2\,a^2\,b\,f^{2\,x}\,\ln(f)\right)} + \frac{\operatorname{atan}\left(\frac{f^x\,\sqrt{a^3\,b^3\,{\ln(f)}^2}}{a\,b^2\,\ln(f)}\right)}{8\,\sqrt{a^3\,b^3\,{\ln(f)}^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b/f^x + a*f^x)^3,x)
```

```
[Out] f^x/(8*(a*b^2*log(f) + a^2*b*f^(2*x)*log(f))) - f^x/(4*(a*b^2*log(f) + a^3*
f^(4*x)*log(f) + 2*a^2*b*f^(2*x)*log(f))) + atan((f^x*(a^3*b^3*log(f)^2)^(1
/2))/(a*b^2*log(f)))/(8*(a^3*b^3*log(f)^2)^(1/2))
```

3.63 $\int \frac{x}{(bf^{-x}+af^x)^3}\,dx$

Optimal. Leaf size=196

$$\frac{f^x}{8ab\left(b+af^{2x}\right)\log^2(f)}-\frac{f^x x}{4a\left(b+af^{2x}\right)^2\log(f)}+\frac{f^x x}{8ab\left(b+af^{2x}\right)\log(f)}+\frac{x\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)}-\frac{i\mathrm{Li}_2\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{16a^{3/2}b^{3/2}\log^2(f)}$$

```
[Out] 1/8*f^x/a/b/(b+a*f^(2*x))/ln(f)^2-1/4*f^x*x/a/(b+a*f^(2*x))^2/ln(f)+1/8*f^x
*x/a/b/(b+a*f^(2*x))/ln(f)+1/8*x*arctan(f^x*a^(1/2)/b^(1/2))/a^(3/2)/b^(3/2
)/ln(f)-1/16*I*polylog(2,-I*f^x*a^(1/2)/b^(1/2))/a^(3/2)/b^(3/2)/ln(f)^2+1/
16*I*polylog(2,I*f^x*a^(1/2)/b^(1/2))/a^(3/2)/b^(3/2)/ln(f)^2
```

Rubi [A]

time = 0.38, antiderivative size = 196, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 9, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.529$, Rules used = {2321, 2286, 2281, 205, 211, 2277, 2320, 4940, 2438}

$$-\frac{i\text{PolyLog}\left(2,-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{16a^{3/2}b^{3/2}\log^2(f)}+\frac{i\text{PolyLog}\left(2,\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{16a^{3/2}b^{3/2}\log^2(f)}+\frac{x\text{ArcTan}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)}+\frac{f^x}{8ab\log^2(f)\left(af^{2x}+b\right)}+\frac{xf^x}{8ab\log(f)\left(af^{2x}+b\right)}-\frac{xf^x}{4a\log(f)\left(af^{2x}+b\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x/(b/f^x + a*f^x)^3,x]
```

```
[Out] f^x/(8*a*b*(b + a*f^(2*x))*Log[f]^2) - (f^x*x)/(4*a*(b + a*f^(2*x))^2*Log[f
]) + (f^x*x)/(8*a*b*(b + a*f^(2*x))*Log[f]) + (x*ArcTan[(Sqrt[a]*f^x)/Sqrt[
b]])/(8*a^(3/2)*b^(3/2)*Log[f]) - ((I/16)*PolyLog[2, ((-I)*Sqrt[a]*f^x)/Sqr
t[b]])/(a^(3/2)*b^(3/2)*Log[f]^2) + ((I/16)*PolyLog[2, (I*Sqrt[a]*f^x)/Sqrt
[b]])/(a^(3/2)*b^(3/2)*Log[f]^2)
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integ
erQ[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denom
inator[p + 1/n] < Denominator[p])
```

Rule 211

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

Rule 2277

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
```

```
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2286

```
Int[((a_.) + (b_.)*(F_)^(u_))^(p_.)*((c_.) + (d_.)*(F_)^(v_))^(q_.)*((e_.)
+ (f_.)*(x_))^(m_.), x_Symbol] :> With[{w = ExpandIntegrand[(e + f*x)^m, (a
 + b*F^u)^p*(c + d*F^v)^q, x]}, Int[w, x] /; SumQ[w]] /; FreeQ[{F, a, b, c,
 d, e, f, m}, x] && IntegersQ[p, q] && LinearQ[{u, v}, x] && RationalQ[Simp
lify[u/v]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2321

```
Int[(u_.)*((a_.)*(F_)^(v_) + (b_.)*(F_)^(w_))^(n_), x_Symbol] :> Int[u*F^(n
*v)*(a + b*F^ExpandToSum[w - v, x])^n, x] /; FreeQ[{F, a, b, n}, x] && ILtQ
[n, 0] && LinearQ[{v, w}, x]
```

Rule 2438

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

Rule 4940

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

Rubi steps

$$\int \frac{x}{(bf^{-x}+af^x)^3}\,dx = \int \frac{f^{3x}x}{(b+af^{2x})^3}\,dx$$
$$= \int \left(-\frac{bf^xx}{a(b+af^{2x})^3}+\frac{f^xx}{a(b+af^{2x})^2}\right)dx$$
$$= \frac{\int \frac{f^xx}{(b+af^{2x})^2}\,dx}{a}-\frac{b\int \frac{f^xx}{(b+af^{2x})^3}\,dx}{a}$$

$$= -\frac{f^xx}{4a(b+af^{2x})^2\log(f)}+\frac{f^xx}{8ab(b+af^{2x})\log(f)}+\frac{x\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)}-\frac{\int\left(\frac{f^x}{2b(b+af^{2x}}\right.}{}$$

$$= -\frac{f^xx}{4a(b+af^{2x})^2\log(f)}+\frac{f^xx}{8ab(b+af^{2x})\log(f)}+\frac{x\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)}+\frac{\int \frac{f^x}{(b+af^{2x})^2}\,d}{4a\log(f)}$$

$$= -\frac{f^xx}{4a(b+af^{2x})^2\log(f)}+\frac{f^xx}{8ab(b+af^{2x})\log(f)}+\frac{x\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)}+\frac{\text{Subst}\left(\int \frac{}{(b+}\right.}{4a\,\mathrm{l}}$$

$$= \frac{f^x}{8ab(b+af^{2x})\log^2(f)}-\frac{\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log^2(f)}-\frac{f^xx}{4a(b+af^{2x})^2\log(f)}+\frac{f^xx}{8ab(b+af^{2x})}$$

$$= \frac{f^x}{8ab(b+af^{2x})\log^2(f)}-\frac{f^xx}{4a(b+af^{2x})^2\log(f)}+\frac{f^xx}{8ab(b+af^{2x})\log(f)}+\frac{x\tan^{-1}\left(\right.}{8a^{3/2}b^{3/2}}$$

Mathematica [A]
time = 0.19, size = 209, normalized size = 1.07

$$\frac{\frac{2\sqrt{a}f^x}{b^2+abf^{2x}}-\frac{4\sqrt{a}f^xx\log(f)}{(b+af^{2x})^2}+\frac{2\sqrt{a}f^xx\log(f)}{b^2+abf^{2x}}+\frac{ix\log(f)\log\left(1-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{b^{3/2}}-\frac{ix\log(f)\log\left(1+\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{b^{3/2}}-\frac{i\text{Li}_2\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{b^{3/2}}+\frac{i\text{Li}_2\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{b^{3/2}}}{16a^{3/2}\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(b/f^x + a*f^x)^3,x]
[Out] ((2*Sqrt[a]*f^x)/(b^2 + a*b*f^(2*x)) - (4*Sqrt[a]*f^x*x*Log[f])/(b + a*f^(2
*x))^2 + (2*Sqrt[a]*f^x*x*Log[f])/(b^2 + a*b*f^(2*x)) + (I*x*Log[f]*Log[1 -
```

```
(I*Sqrt[a]*f^x)/Sqrt[b]])/b^(3/2) - (I*x*Log[f]*Log[1 + (I*Sqrt[a]*f^x)/Sq
rt[b]])/b^(3/2) - (I*PolyLog[2, ((-I)*Sqrt[a]*f^x)/Sqrt[b]])/b^(3/2) + (I*P
olyLog[2, (I*Sqrt[a]*f^x)/Sqrt[b]])/b^(3/2))/(16*a^(3/2)*Log[f]^2)
```

Maple [A]
time = 0.05, size = 209, normalized size = 1.07

method	result
risch	$\frac{f^{x}\left(f^{2x}\ln(f)ax-\ln(f)bx+a\,f^{2x}+b\right)}{8\ln(f)^{2}ba\left(b+a\,f^{2x}\right)^{2}}+\frac{x\ln\left(\frac{-a\,f^{x}+\sqrt{-ba}}{\sqrt{-ba}}\right)}{16\ln(f)ab\sqrt{-ba}}-\frac{x\ln\left(\frac{a\,f^{x}+\sqrt{-ba}}{\sqrt{-ba}}\right)}{16\ln(f)ab\sqrt{-ba}}+\frac{\operatorname{dilog}\left(\frac{-a\,f^{x}+\sqrt{-ba}}{\sqrt{-ba}}\right)}{16\ln(f)^{2}ab\sqrt{-ba}}-\frac{\operatorname{dilog}}{16\,\mathrm{l}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(b/(f^x)+a*f^x)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/8*f^x*((f^x)^2*ln(f)*a*x-ln(f)*b*x+a*(f^x)^2+b)/ln(f)^2/b/a/(a*(f^x)^2+b)
^2+1/16/ln(f)/a/b*x/(-b*a)^(1/2)*ln((-a*f^x+(-b*a)^(1/2))/(-b*a)^(1/2))-1/1
6/ln(f)/a/b*x/(-b*a)^(1/2)*ln((a*f^x+(-b*a)^(1/2))/(-b*a)^(1/2))+1/16/ln(f)
^2/a/b/(-b*a)^(1/2)*dilog((-a*f^x+(-b*a)^(1/2))/(-b*a)^(1/2))-1/16/ln(f)^2/
a/b/(-b*a)^(1/2)*dilog((a*f^x+(-b*a)^(1/2))/(-b*a)^(1/2))
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/8*((a*x*log(f) + a)*f^(3*x) - (b*x*log(f) - b)*f^x)/(a^3*b*f^(4*x)*log(f)
^2 + 2*a^2*b^2*f^(2*x)*log(f)^2 + a*b^3*log(f)^2) + integrate(1/8*f^x*x/(a^
2*b*f^(2*x) + a*b^2), x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 352 vs. $2(150) = 300$.
time = 0.38, size = 352, normalized size = 1.80

$$\frac{2\left(a^{2}x\log(f)+a^{2}\right)f^{3x}-2\left(abx\log(f)-ab\right)f^{x}+\left(a^{2}f^{4x}\sqrt{-\frac{a}{b}}+2\,abf^{2x}\sqrt{-\frac{a}{b}}+b^{2}\sqrt{-\frac{a}{b}}\right)\mathrm{Li}_2\left(f^{x}\sqrt{-\frac{a}{b}}\right)-\left(a^{2}f^{4x}\sqrt{-\frac{a}{b}}+2\,abf^{2x}\sqrt{-\frac{a}{b}}+b^{2}\sqrt{-\frac{a}{b}}\right)\mathrm{Li}_2\left(-f^{x}\sqrt{-\frac{a}{b}}\right)-\left(a^{2}f^{4x}x\sqrt{-\frac{a}{b}}\log(f)+2\,abf^{2x}x\sqrt{-\frac{a}{b}}\log(f)+b^{2}x\sqrt{-\frac{a}{b}}\log(f)\right)\log\left(f^{x}\sqrt{-\frac{a}{b}}+1\right)+\left(a^{2}f^{4x}x\sqrt{-\frac{a}{b}}\log(f)+2\,abf^{2x}x\sqrt{-\frac{a}{b}}\log(f)+b^{2}x\sqrt{-\frac{a}{b}}\log(f)\right)\log\left(-f^{x}\sqrt{-\frac{a}{b}}+1\right)}{16\left(a^{4}bf^{4x}\log(f)^{2}+2\,a^{3}b^{2}f^{2x}\log(f)^{2}+a^{2}b^{3}\log(f)^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/16*(2*(a^2*x*log(f) + a^2)*f^(3*x) - 2*(a*b*x*log(f) - a*b)*f^x + (a^2*f^
(4*x)*sqrt(-a/b) + 2*a*b*f^(2*x)*sqrt(-a/b) + b^2*sqrt(-a/b))*dilog(f^x*sqr
t(-a/b)) - (a^2*f^(4*x)*sqrt(-a/b) + 2*a*b*f^(2*x)*sqrt(-a/b) + b^2*sqrt(-a
```

```
/b))*dilog(-f^x*sqrt(-a/b)) - (a^2*f^(4*x)*x*sqrt(-a/b)*log(f) + 2*a*b*f^(2
*x)*x*sqrt(-a/b)*log(f) + b^2*x*sqrt(-a/b)*log(f))*log(f^x*sqrt(-a/b) + 1)
+ (a^2*f^(4*x)*x*sqrt(-a/b)*log(f) + 2*a*b*f^(2*x)*x*sqrt(-a/b)*log(f) + b^
2*x*sqrt(-a/b)*log(f))*log(-f^x*sqrt(-a/b) + 1))/(a^4*b*f^(4*x)*log(f)^2 +
2*a^3*b^2*f^(2*x)*log(f)^2 + a^2*b^3*log(f)^2)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{f^{-x}(ax\log{(f)}+a)+f^{-3x}(-bx\log{(f)}+b)}{8a^3b\log{(f)}^2+16a^2b^2f^{-2x}\log{(f)}^2+8ab^3f^{-4x}\log{(f)}^2}+\frac{\int\frac{f^xx}{af^{2x}+b}\,dx}{8ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b/(f**x)+a*f**x)**3,x)
```

```
[Out] ((a*x*log(f) + a)/f**x + (-b*x*log(f) + b)/f**(3*x))/(8*a**3*b*log(f)**2 +
16*a**2*b**2*log(f)**2/f**(2*x) + 8*a*b**3*log(f)**2/f**(4*x)) + Integral(f
**x*x/(a*f**(2*x) + b), x)/(8*a*b)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(x/(a*f^x + b/f^x)^3, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{x}{{\left(\frac{b}{f^x}+a\,f^x\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(b/f^x + a*f^x)^3,x)
```

```
[Out] int(x/(b/f^x + a*f^x)^3, x)
```

3.64 $\int \frac{x^2}{(bf^{-x}+af^x)^3}\,dx$

Optimal. Leaf size=316

$$-\frac{\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{4a^{3/2}b^{3/2}\log^3(f)}+\frac{f^x x}{4ab\,(b+af^{2x})\log^2(f)}-\frac{f^x x^2}{4a\,(b+af^{2x})^2\log(f)}+\frac{f^x x^2}{8ab\,(b+af^{2x})\log(f)}+\frac{x^2\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)}$$

```
[Out] -1/4*arctan(f^x*a^(1/2)/b^(1/2))/a^(3/2)/b^(3/2)/ln(f)^3+1/4*f^x*x/a/b/(b+a
*f^(2*x))/ln(f)^2-1/4*f^x*x^2/a/(b+a*f^(2*x))^2/ln(f)+1/8*f^x*x^2/a/b/(b+a*
f^(2*x))/ln(f)+1/8*x^2*arctan(f^x*a^(1/2)/b^(1/2))/a^(3/2)/b^(3/2)/ln(f)-1/
8*I*x*polylog(2,-I*f^x*a^(1/2)/b^(1/2))/a^(3/2)/b^(3/2)/ln(f)^2+1/8*I*x*pol
ylog(2,I*f^x*a^(1/2)/b^(1/2))/a^(3/2)/b^(3/2)/ln(f)^2+1/8*I*polylog(3,-I*f^
x*a^(1/2)/b^(1/2))/a^(3/2)/b^(3/2)/ln(f)^3-1/8*I*polylog(3,I*f^x*a^(1/2)/b^
(1/2))/a^(3/2)/b^(3/2)/ln(f)^3
```

Rubi [A]

time = 0.88, antiderivative size = 316, normalized size of antiderivative = 1.00, number of steps used = 43, number of rules used = 14, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.737, Rules used = {2321, 2286, 2281, 205, 211, 2277, 14, 2320, 4940, 2438, 12, 5251, 2611, 6724}

$$\frac{i\text{PolyLog}\left(3,-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log^3(f)}-\frac{i\text{PolyLog}\left(3,\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log^3(f)}-\frac{ix\text{PolyLog}\left(2,-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log^2(f)}+\frac{ix\text{PolyLog}\left(2,\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log^2(f)}+\frac{x^2\text{ArcTan}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)}-\frac{\text{ArcTan}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{4a^{3/2}b^{3/2}\log^3(f)}+\frac{x^2f^x}{8ab\log(f)\,(af^{2x}+b)}-\frac{x^2f^x}{4a\log(f)\,(af^{2x}+b)^2}+\frac{xf^x}{4ab\log^2(f)\,(af^{2x}+b)}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(b/f^x + a*f^x)^3,x]
```

```
[Out] -1/4*ArcTan[(Sqrt[a]*f^x)/Sqrt[b]]/(a^(3/2)*b^(3/2)*Log[f]^3) + (f^x*x)/(4*
a*b*(b + a*f^(2*x))*Log[f]^2) - (f^x*x^2)/(4*a*(b + a*f^(2*x))^2*Log[f]) +
(f^x*x^2)/(8*a*b*(b + a*f^(2*x))*Log[f]) + (x^2*ArcTan[(Sqrt[a]*f^x)/Sqrt[b
]])/(8*a^(3/2)*b^(3/2)*Log[f]) - ((I/8)*x*PolyLog[2, ((-I)*Sqrt[a]*f^x)/Sqr
t[b]])/(a^(3/2)*b^(3/2)*Log[f]^2) + ((I/8)*x*PolyLog[2, (I*Sqrt[a]*f^x)/Sqr
t[b]])/(a^(3/2)*b^(3/2)*Log[f]^2) + ((I/8)*PolyLog[3, ((-I)*Sqrt[a]*f^x)/Sq
rt[b]])/(a^(3/2)*b^(3/2)*Log[f]^3) - ((I/8)*PolyLog[3, (I*Sqrt[a]*f^x)/Sqrt
[b]])/(a^(3/2)*b^(3/2)*Log[f]^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(-x)*((a + b*x^n)^(p +
 1)/(a*n*(p + 1))), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n
)^(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integ
erQ[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denom
inator[p + 1/n] < Denominator[p])
```

Rule 211

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

Rule 2277

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2286

```
Int[((a_.) + (b_.)*(F_)^(u_))^(p_.)*((c_.) + (d_.)*(F_)^(v_))^(q_.)*((e_.)
+ (f_.)*(x_))^(m_.), x_Symbol] :> With[{w = ExpandIntegrand[(e + f*x)^m, (a
 + b*F^u)^p*(c + d*F^v)^q, x]}, Int[w, x] /; SumQ[w]] /; FreeQ[{F, a, b, c,
 d, e, f, m}, x] && IntegersQ[p, q] && LinearQ[{u, v}, x] && RationalQ[Simp
lify[u/v]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2321

```
Int[(u_.)*((a_.)*(F_)^(v_) + (b_.)*(F_)^(w_))^(n_), x_Symbol] :> Int[u*F^(n
*v)*(a + b*F^ExpandToSum[w - v, x])^n, x] /; FreeQ[{F, a, b, n}, x] && ILtQ
[n, 0] && LinearQ[{v, w}, x]
```

Rule 2438

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

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 4940

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

Rule 5251

```
Int[ArcTan[(a_.) + (b_.)*(f_)^((c_.) + (d_.)*(x_))]*(x_)^(m_.), x_Symbol] :
> Dist[I/2, Int[x^m*Log[1 - I*a - I*b*f^(c + d*x)], x], x] - Dist[I/2, Int[
x^m*Log[1 + I*a + I*b*f^(c + d*x)], x], x] /; FreeQ[{a, b, c, d, f}, x] &&
IntegerQ[m] && m > 0
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^2}{(bf^{-x}+af^x)^3}\,dx = \int \frac{f^{3x}x^2}{(b+af^{2x})^3}\,dx$$

$$= \int \left(-\frac{bf^x x^2}{a\,(b+af^{2x})^3} + \frac{f^x x^2}{a\,(b+af^{2x})^2}\right)dx$$

$$= \frac{\int \frac{f^x x^2}{(b+af^{2x})^2}\,dx}{a} - \frac{b\int \frac{f^x x^2}{(b+af^{2x})^3}\,dx}{a}$$

$$= -\frac{f^x x^2}{4a\,(b+af^{2x})^2\log(f)} + \frac{f^x x^2}{8ab\,(b+af^{2x})\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)} - \frac{2\int x\left(\frac{\quad}{2b(b\ldots}\right.}{\quad}$$

$$= -\frac{f^x x^2}{4a\,(b+af^{2x})^2\log(f)} + \frac{f^x x^2}{8ab\,(b+af^{2x})\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)} - \frac{2\int\left(\frac{\quad}{2b(b+a\ldots}\right.}{\quad}$$

$$= -\frac{f^x x^2}{4a\,(b+af^{2x})^2\log(f)} + \frac{f^x x^2}{8ab\,(b+af^{2x})\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)} + \frac{\int \frac{f^x x}{(b+af^{2x})^2}\ldots}{2a\log(f)\ldots}$$

$$= \frac{f^x x}{4ab\,(b+af^{2x})\log^2(f)} - \frac{f^x x^2}{4a\,(b+af^{2x})^2\log(f)} + \frac{f^x x^2}{8ab\,(b+af^{2x})\log(f)} + \frac{x^2\tan^{-1}\left(\ldots\right.}{8a^{3/2}b^{3/2}\ldots}$$

$$= \frac{f^x x}{4ab\,(b+af^{2x})\log^2(f)} - \frac{f^x x^2}{4a\,(b+af^{2x})^2\log(f)} + \frac{f^x x^2}{8ab\,(b+af^{2x})\log(f)} + \frac{x^2\tan^{-1}\left(\ldots\right.}{8a^{3/2}b^{3/2}\ldots}$$

$$= \frac{f^x x}{4ab\,(b+af^{2x})\log^2(f)} - \frac{f^x x^2}{4a\,(b+af^{2x})^2\log(f)} + \frac{f^x x^2}{8ab\,(b+af^{2x})\log(f)} + \frac{x^2\tan^{-1}\left(\ldots\right.}{8a^{3/2}b^{3/2}\ldots}$$

$$= -\frac{\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{4a^{3/2}b^{3/2}\log^3(f)} + \frac{f^x x}{4ab\,(b+af^{2x})\log^2(f)} - \frac{f^x x^2}{4a\,(b+af^{2x})^2\log(f)} + \frac{f^x x^2}{8ab\,(b+af^{2x}\ldots}$$

$$= -\frac{\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{4a^{3/2}b^{3/2}\log^3(f)} + \frac{f^x x}{4ab\,(b+af^{2x})\log^2(f)} - \frac{f^x x^2}{4a\,(b+af^{2x})^2\log(f)} + \frac{f^x x^2}{8ab\,(b+af^{2x}\ldots}$$

Mathematica [A]
time = 0.36, size = 254, normalized size = 0.80

$$\frac{-\frac{12\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{b^{3/2}}-\frac{12\sqrt{a}f^xx^2\log^2(f)}{(b+af^{2x})^2}+\frac{6\sqrt{a}f^xx\log(f)(2+x\log(f))}{b(b+af^{2x})}+\frac{3i\left(x^2\log^2(f)\log\left(1-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)-x^2\log^2(f)\log\left(1+\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)-2x\log(f)\mathrm{Li}_2\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)+2x\log(f)\mathrm{Li}_2\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)+2\mathrm{Li}_3\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)-2\mathrm{Li}_3\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)\right)}{b^{3/2}}}{48a^{3/2}\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(b/f^x + a*f^x)^3,x]
```

```
[Out] ((-12*ArcTan[(Sqrt[a]*f^x)/Sqrt[b]])/b^(3/2) - (12*Sqrt[a]*f^x*x^2*Log[f]^2
)/(b + a*f^(2*x))^2 + (6*Sqrt[a]*f^x*x*Log[f]*(2 + x*Log[f]))/(b*(b + a*f^(
2*x))) + ((3*I)*(x^2*Log[f]^2*Log[1 - (I*Sqrt[a]*f^x)/Sqrt[b]] - x^2*Log[f]
^2*Log[1 + (I*Sqrt[a]*f^x)/Sqrt[b]] - 2*x*Log[f]*PolyLog[2, ((-I)*Sqrt[a]*f
^x)/Sqrt[b]] + 2*x*Log[f]*PolyLog[2, (I*Sqrt[a]*f^x)/Sqrt[b]] + 2*PolyLog[3
, ((-I)*Sqrt[a]*f^x)/Sqrt[b]] - 2*PolyLog[3, (I*Sqrt[a]*f^x)/Sqrt[b]]))/b^(
3/2))/(48*a^(3/2)*Log[f]^3)
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(b\,f^{-x}+a\,f^{x}\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(b/(f^x)+a*f^x)^3,x)
```

```
[Out] int(x^2/(b/(f^x)+a*f^x)^3,x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(b/(f^x)+a*f^x)^3,x, algorithm="maxima")
```

```
[Out] 1/8*((a*x^2*log(f) + 2*a*x)*f^(3*x) - (b*x^2*log(f) - 2*b*x)*f^x)/(a^3*b*f^
(4*x)*log(f)^2 + 2*a^2*b^2*f^(2*x)*log(f)^2 + a*b^3*log(f)^2) + integrate(1
/8*(x^2*log(f)^2 - 2)*f^x/(a^2*b*f^(2*x)*log(f)^2 + a*b^2*log(f)^2), x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 674 vs. 2(232) = 464.
time = 0.37, size = 674, normalized size = 2.13

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(b/(f^x)+a*f^x)^3,x, algorithm="fricas")
```

```
[Out] 1/16*(2*(a^2*x^2*log(f)^2 + 2*a^2*x*log(f))*f^(3*x) - 2*(a*b*x^2*log(f)^2 -
 2*a*b*x*log(f))*f^x + 2*(a^2*f^(4*x)*x*sqrt(-a/b)*log(f) + 2*a*b*f^(2*x)*x
*sqrt(-a/b)*log(f) + b^2*x*sqrt(-a/b)*log(f))*dilog(f^x*sqrt(-a/b)) - 2*(a^
2*f^(4*x)*x*sqrt(-a/b)*log(f) + 2*a*b*f^(2*x)*x*sqrt(-a/b)*log(f) + b^2*x*s
qrt(-a/b)*log(f))*dilog(-f^x*sqrt(-a/b)) - 2*(a^2*f^(4*x)*sqrt(-a/b) + 2*a*
b*f^(2*x)*sqrt(-a/b) + b^2*sqrt(-a/b))*log(2*a*f^x + 2*b*sqrt(-a/b)) + 2*(a
^2*f^(4*x)*sqrt(-a/b) + 2*a*b*f^(2*x)*sqrt(-a/b) + b^2*sqrt(-a/b))*log(2*a*
f^x - 2*b*sqrt(-a/b)) - (a^2*f^(4*x)*x^2*sqrt(-a/b)*log(f)^2 + 2*a*b*f^(2*x
)*x^2*sqrt(-a/b)*log(f)^2 + b^2*x^2*sqrt(-a/b)*log(f)^2)*log(f^x*sqrt(-a/b)
 + 1) + (a^2*f^(4*x)*x^2*sqrt(-a/b)*log(f)^2 + 2*a*b*f^(2*x)*x^2*sqrt(-a/b)
*log(f)^2 + b^2*x^2*sqrt(-a/b)*log(f)^2)*log(-f^x*sqrt(-a/b) + 1) - 2*(a^2*
f^(4*x)*sqrt(-a/b) + 2*a*b*f^(2*x)*sqrt(-a/b) + b^2*sqrt(-a/b))*polylog(3,
f^x*sqrt(-a/b)) + 2*(a^2*f^(4*x)*sqrt(-a/b) + 2*a*b*f^(2*x)*sqrt(-a/b) + b^
2*sqrt(-a/b))*polylog(3, -f^x*sqrt(-a/b)))/(a^4*b*f^(4*x)*log(f)^3 + 2*a^3*
b^2*f^(2*x)*log(f)^3 + a^2*b^3*log(f)^3)
```

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

$$\frac{f^{-x}(ax^2\log(f)+2ax)+f^{-3x}(-bx^2\log(f)+2bx)}{8a^3b\log(f)^2+16a^2b^2f^{-2x}\log(f)^2+8ab^3f^{-4x}\log(f)^2}+\frac{\int\left(-\frac{2f^x}{af^{2x}+b}\right)dx+\int\frac{f^xx^2\log(f)^2}{af^{2x}+b}\,dx}{8ab\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(b/(f**x)+a*f**x)**3,x)
```

```
[Out] ((a*x**2*log(f) + 2*a*x)/f**x + (-b*x**2*log(f) + 2*b*x)/f**(3*x))/(8*a**3*
b*log(f)**2 + 16*a**2*b**2*log(f)**2/f**(2*x) + 8*a*b**3*log(f)**2/f**(4*x)
) + (Integral(-2*f**x/(a*f**(2*x) + b), x) + Integral(f**x*x**2*log(f)**2/(
a*f**(2*x) + b), x))/(8*a*b*log(f)**2)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(b/(f^x)+a*f^x)^3,x, algorithm="giac")
```

```
[Out] integrate(x^2/(a*f^x + b/f^x)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{x^2}{{\left(\frac{b}{f^x}+a\,f^x\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(b/f^x + a*f^x)^3,x)
[Out] int(x^2/(b/f^x + a*f^x)^3, x)
```

3.65 $\int f^{a+bx+cx^2} g^{d+ex+fx^2} \, dx$

Optimal. Leaf size=95

$$\frac{e^{-\frac{(b\log(f)+e\log(g))^2}{4(c\log(f)+f\log(g))}} f^a g^d \sqrt{\pi}\, \text{erfi}\left(\frac{b\log(f)+e\log(g)+2x(c\log(f)+f\log(g))}{2\sqrt{c\log(f)+f\log(g)}}\right)}{2\sqrt{c\log(f)+f\log(g)}}$$

```
[Out] 1/2*f^a*g^d*erfi(1/2*(b*ln(f)+e*ln(g)+2*x*(c*ln(f)+f*ln(g)))/(c*ln(f)+f*ln(
g))^(1/2))*Pi^(1/2)/exp(1/4*(b*ln(f)+e*ln(g))^2/(c*ln(f)+f*ln(g)))/(c*ln(f)
+f*ln(g))^(1/2)
```

Rubi [A]

time = 0.13, antiderivative size = 95, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.120$, Rules used = {2325, 2266, 2235}

$$\frac{\sqrt{\pi}\, f^a g^d \exp\left(-\frac{(b\log(f)+e\log(g))^2}{4(c\log(f)+f\log(g))}\right) \text{Erfi}\left(\frac{b\log(f)+2x(c\log(f)+f\log(g))+e\log(g)}{2\sqrt{c\log(f)+f\log(g)}}\right)}{2\sqrt{c\log(f)+f\log(g)}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)*g^(d + e*x + f*x^2),x]
```

```
[Out] (f^a*g^d*Sqrt[Pi]*Erfi[(b*Log[f] + e*Log[g] + 2*x*(c*Log[f] + f*Log[g]))/(2
*Sqrt[c*Log[f] + f*Log[g]])])/(2*E^((b*Log[f] + e*Log[g])^2/(4*(c*Log[f] +
f*Log[g])))*Sqrt[c*Log[f] + f*Log[g]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2325

```
Int[(u_.)*(F_)^(v_)*(G_)^(w_), x_Symbol] :> With[{z = v*Log[F] + w*Log[G]},
 Int[u*NormalizeIntegrand[E^z, x], x] /; BinomialQ[z, x] || (PolynomialQ[z,
 x] && LeQ[Exponent[z, x], 2])] /; FreeQ[{F, G}, x]
```

Rubi steps

$$\int f^{a+bx+cx^2} g^{d+ex+fx^2} \, dx = \int \exp \left(a \log(f) + d \log(g) + x(b \log(f) + e \log(g)) + x^2(c \log(f) + f \log(g))\right) \, dx$$

$$= \left(\exp \left(-\frac{(b \log(f) + e \log(g))^2}{4(c \log(f) + f \log(g))}\right) f^a g^d\right) \int \exp \left(\frac{(b \log(f) + e \log(g) + 2x(c \log(f}{4(c \log(f) + f \log(g}\right.$$

$$= \frac{\exp \left(-\frac{(b \log(f)+e \log(g))^2}{4(c \log(f)+f \log(g))}\right) f^a g^d \sqrt{\pi} \operatorname{erfi}\left(\frac{b \log(f)+e \log(g)+2x(c \log(f)+f \log(g))}{2\sqrt{c \log(f) + f \log(g)}}\right)}{2\sqrt{c \log(f) + f \log(g)}}$$

Mathematica [A]
time = 0.20, size = 93, normalized size = 0.98

$$\frac{e^{-\frac{(b \log(f)+e \log(g))^2}{4(c \log(f)+f \log(g))}} f^a g^d \sqrt{\pi} \operatorname{erfi}\left(\frac{(b+2cx) \log(f)+(e+2fx) \log(g)}{2\sqrt{c \log(f) + f \log(g)}}\right)}{2\sqrt{c \log(f) + f \log(g)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)*g^(d + e*x + f*x^2),x]
[Out] (f^a*g^d*Sqrt[Pi]*Erfi[((b + 2*c*x)*Log[f] + (e + 2*f*x)*Log[g])/(2*Sqrt[c*
Log[f] + f*Log[g]])])/(2*E^((b*Log[f] + e*Log[g])^2/(4*(c*Log[f] + f*Log[g]
)))*Sqrt[c*Log[f] + f*Log[g]])
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int f^{c\,x^2+bx+a} g^{f\,x^2+ex+d} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)*g^(f*x^2+e*x+d),x)
[Out] int(f^(c*x^2+b*x+a)*g^(f*x^2+e*x+d),x)
```

Maxima [A]
time = 0.28, size = 90, normalized size = 0.95

$$\frac{\sqrt{\pi} f^a g^d \operatorname{erf}\left(\sqrt{-c \log(f) - f \log(g)}\, x - \frac{b \log(f)+e \log(g)}{2\sqrt{-c \log(f) - f \log(g)}}\right) e^{\left(-\frac{(b \log(f)+e \log(g))^2}{4\,(c \log(f)+f \log(g))}\right)}}{2\sqrt{-c \log(f) - f \log(g)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*g^(f*x^2+e*x+d),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(pi)*f^a*g^d*erf(sqrt(-c*log(f) - f*log(g))*x - 1/2*(b*log(f) + e*l
og(g))/sqrt(-c*log(f) - f*log(g)))*e^(-1/4*(b*log(f) + e*log(g))^2/(c*log(f
) + f*log(g)))/sqrt(-c*log(f) - f*log(g))
```

Fricas [A]
time = 0.35, size = 139, normalized size = 1.46

$$-\frac{\sqrt{\pi}\,\sqrt{-c\log\left(f\right)-f\log\left(g\right)}\,\operatorname{erf}\left(\frac{\left(\left(2\,cx+b\right)\log\left(f\right)+\left(2\,fx+e\right)\log\left(g\right)\right)\sqrt{-c\log\left(f\right)-f\log\left(g\right)}}{2\,\left(c\log\left(f\right)+f\log\left(g\right)\right)}\right)e^{\left(-\frac{\left(b^{2}-4\,ac\right)\log\left(f\right)^{2}-2\,\left(2\,cd+2\,af-be\right)\log\left(f\right)\log\left(g\right)-\left(4\,df-e^{2}\right)\log\left(g\right)^{2}}{4\,\left(c\log\left(f\right)+f\log\left(g\right)\right)}\right)}}{2\,\left(c\log\left(f\right)+f\log\left(g\right)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*g^(f*x^2+e*x+d),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-c*log(f) - f*log(g))*erf(1/2*((2*c*x + b)*log(f) + (2*f
*x + e)*log(g))*sqrt(-c*log(f) - f*log(g))/(c*log(f) + f*log(g)))*e^(-1/4*(
(b^2 - 4*a*c)*log(f)^2 - 2*(2*c*d + 2*a*f - b*e)*log(f)*log(g) - (4*d*f - e
^2)*log(g)^2)/(c*log(f) + f*log(g)))/(c*log(f) + f*log(g))
```

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

$$\int f^{a+bx+cx^{2}}g^{d+ex+fx^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)*g**(f*x**2+e*x+d),x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)*g**(d + e*x + f*x**2), x)
```

Giac [A]
time = 1.80, size = 131, normalized size = 1.38

$$-\frac{\sqrt{\pi}\,\operatorname{erf}\left(-\frac{1}{2}\,\sqrt{-c\log\left(f\right)-f\log\left(g\right)}\,\left(2\,x+\frac{b\log\left(f\right)+e\log\left(g\right)}{c\log\left(f\right)+f\log\left(g\right)}\right)\right)e^{\left(-\frac{b^{2}\log\left(f\right)^{2}-4\,ac\log\left(f\right)^{2}-4\,cd\log\left(f\right)\log\left(g\right)-4\,af\log\left(f\right)\log\left(g\right)+2\,be\log\left(f\right)\log\left(g\right)-4\,df\log\left(g\right)^{2}+e^{2}\log\left(g\right)^{2}}{4\,\left(c\log\left(f\right)+f\log\left(g\right)\right)}\right)}}{2\,\sqrt{-c\log\left(f\right)-f\log\left(g\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*g^(f*x^2+e*x+d),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*erf(-1/2*sqrt(-c*log(f) - f*log(g))*(2*x + (b*log(f) + e*log(
g))/(c*log(f) + f*log(g))))*e^(-1/4*(b^2*log(f)^2 - 4*a*c*log(f)^2 - 4*c*d*
log(f)*log(g) - 4*a*f*log(f)*log(g) + 2*b*e*log(f)*log(g) - 4*d*f*log(g)^2
+ e^2*log(g)^2)/(c*log(f) + f*log(g)))/sqrt(-c*log(f) - f*log(g))
```

Mupad [B]
time = 0.10, size = 130, normalized size = 1.37

$$-\frac{f^a\,g^d\,\sqrt{\pi }\,{\mathrm{e}}^{-\frac{b^2\,{\ln\left(f\right)}^2}{4\,\left(c\,\ln\left(f\right)+f\,\ln\left(g\right)\right)}-\frac{e^2\,{\ln\left(g\right)}^2}{4\,\left(c\,\ln\left(f\right)+f\,\ln\left(g\right)\right)}-\frac{b\,e\,\ln\left(f\right)\,\ln\left(g\right)}{2\,\left(c\,\ln\left(f\right)+f\,\ln\left(g\right)\right)}}\,\mathrm{erf}\left(\frac{x\,\left(c\,\ln\left(f\right)+f\,\ln\left(g\right)\right)\,2{}\mathrm{i}+b\,\ln\left(f\right)\,1{}\mathrm{i}+e\,\ln\left(g\right)\,1{}\mathrm{i}}{2\,\sqrt{c\,\ln\left(f\right)+f\,\ln\left(g\right)}}\right)\,1{}\mathrm{i}}{2\,\sqrt{c\,\ln\left(f\right)+f\,\ln\left(g\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)*g^(d + e*x + f*x^2),x)
```

```
[Out] -(f^a*g^d*pi^(1/2)*exp(- (b^2*log(f)^2)/(4*(c*log(f) + f*log(g))) - (e^2*lo
g(g)^2)/(4*(c*log(f) + f*log(g))) - (b*e*log(f)*log(g))/(2*(c*log(f) + f*lo
g(g))))*erf((x*(c*log(f) + f*log(g))*2i + b*log(f)*1i + e*log(g)*1i)/(2*(c*
log(f) + f*log(g))^(1/2)))*1i)/(2*(c*log(f) + f*log(g))^(1/2))
```

3.66 $\int F^{e(c+dx)}\left(a+bG^{h(f+gx)}\right)^n\,dx$

Optimal. Leaf size=106

$$\frac{F^{e(c+dx)}\left(a+bG^{h(f+gx)}\right)^n\left(1+\frac{bG^{h(f+gx)}}{a}\right)^{-n}{}_2F_1\left(-n,\frac{de\log(F)}{gh\log(G)};1+\frac{de\log(F)}{gh\log(G)};-\frac{bG^{h(f+gx)}}{a}\right)}{de\log(F)}$$

```
[Out] F^(e*(d*x+c))*(a+b*G^(h*(g*x+f)))^n*hypergeom([-n, d*e*ln(F)/g/h/ln(G)],[1+
d*e*ln(F)/g/h/ln(G)],-b*G^(h*(g*x+f))/a)/d/e/((1+b*G^(h*(g*x+f))/a)^n)/ln(F
)
```

Rubi [A]
time = 0.06, antiderivative size = 106, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.080$, Rules used = {2284, 2283}

$$\frac{F^{e(c+dx)}\left(a+bG^{h(f+gx)}\right)^n\left(\frac{bG^{h(f+gx)}}{a}+1\right)^{-n}{}_2F_1\left(-n,\frac{de\log(F)}{gh\log(G)};\frac{de\log(F)}{gh\log(G)}+1;-\frac{bG^{h(f+gx)}}{a}\right)}{de\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(e*(c + d*x))*(a + b*G^(h*(f + g*x)))^n,x]
```

```
[Out] (F^(e*(c + d*x))*(a + b*G^(h*(f + g*x)))^n*Hypergeometric2F1[-n, (d*e*Log[F
])/(g*h*Log[G]), 1 + (d*e*Log[F])/(g*h*Log[G]), -((b*G^(h*(f + g*x)))/a)])/
(d*e*(1 + (b*G^(h*(f + g*x)))/a)^n*Log[F])
```

Rule 2283

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_)*(G_)^((h_.)*((f_.
) + (g_.)*(x_))), x_Symbol] :> Simp[a^p*(G^(h*(f + g*x))/(g*h*Log[G]))*Hype
rgeometric2F1[-p, g*h*(Log[G]/(d*e*Log[F])), g*h*(Log[G]/(d*e*Log[F])) + 1,
 Simplify[(-b/a)*F^(e*(c + d*x))]], x] /; FreeQ[{F, G, a, b, c, d, e, f, g,
 h, p}, x] && (ILtQ[p, 0] || GtQ[a, 0])
```

Rule 2284

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_)*(G_)^((h_.)*((f_.
) + (g_.)*(x_))), x_Symbol] :> Dist[(a + b*F^(e*(c + d*x)))^p/(1 + (b/a)*F^
(e*(c + d*x)))^p, Int[G^(h*(f + g*x))*(1 + (b/a)*F^(e*(c + d*x)))^p, x], x]
 /; FreeQ[{F, G, a, b, c, d, e, f, g, h, p}, x] &&  !(ILtQ[p, 0] || GtQ[a,
0])
```

Rubi steps

$$\int F^{e(c+dx)}\left(a+bG^{h(f+gx)}\right)^n\,dx=\left(\left(a+bG^{h(f+gx)}\right)^n\left(1+\frac{bG^{h(f+gx)}}{a}\right)^{-n}\right)\int F^{e(c+dx)}\left(1+\frac{bG^{h(f+gx)}}{a}\right)^n\,dx$$
$$=\frac{F^{e(c+dx)}\left(a+bG^{h(f+gx)}\right)^n\left(1+\frac{bG^{h(f+gx)}}{a}\right)^{-n}\,{}_2F_1\left(-n,\frac{de\log(F)}{gh\log(G)};1+\frac{de\log(F)}{gh\log(G)};\right.}{de\log(F)}$$

Mathematica [A]
time = 0.08, size = 92, normalized size = 0.87

$$\frac{F^{e(c+dx)}\left(a+bG^{h(f+gx)}\right)^{1+n}\,{}_2F_1\left(1,1+n+\frac{de\log(F)}{gh\log(G)};1+\frac{de\log(F)}{gh\log(G)};-\frac{bG^{h(f+gx)}}{a}\right)}{ade\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(e*(c + d*x))*(a + b*G^(h*(f + g*x)))^n,x]
```

```
[Out] (F^(e*(c + d*x))*(a + b*G^(h*(f + g*x)))^(1 + n)*Hypergeometric2F1[1, 1 + n
 + (d*e*Log[F])/(g*h*Log[G]), 1 + (d*e*Log[F])/(g*h*Log[G]), -((b*G^(h*(f +
 g*x)))/a)])/(a*d*e*Log[F])
```

Maple [F]
time = 0.03, size = 0, normalized size = 0.00

$$\int F^{e(dx+c)}\left(a+b\,G^{h(gx+f)}\right)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(e*(d*x+c))*(a+b*G^(h*(g*x+f)))^n,x)
```

```
[Out] int(F^(e*(d*x+c))*(a+b*G^(h*(g*x+f)))^n,x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e*(d*x+c))*(a+b*G^(h*(g*x+f)))^n,x, algorithm="maxima")
```

```
[Out] integrate((G^((g*x + f)*h)*b + a)^n*F^((d*x + c)*e), x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e*(d*x+c))*(a+b*G^(h*(g*x+f)))^n,x, algorithm="fricas")
[Out] integral((G^(g*h*x + f*h)*b + a)^n*F^((d*x + c)*e), x)
```

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

$$\int F^{e(c+dx)}\left(G^{fh}G^{ghx}b+a\right)^{n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(e*(d*x+c))*(a+b*G**(h*(g*x+f)))**n,x)
[Out] Integral(F**(e*(c + d*x))*(G**(f*h)*G**(g*h*x)*b + a)**n, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e*(d*x+c))*(a+b*G^(h*(g*x+f)))^n,x, algorithm="giac")
[Out] integrate((G^((g*x + f)*h)*b + a)^n*F^((d*x + c)*e), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int F^{e\,(c+d\,x)}\,\left(a+G^{h\,(f+g\,x)}\,b\right)^{n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(e*(c + d*x))*(a + G^(h*(f + g*x))*b)^n,x)
[Out] int(F^(e*(c + d*x))*(a + G^(h*(f + g*x))*b)^n, x)
```

3.67 $\int \frac{F^{e(c+dx)}H^{t(r+sx)}}{a+bF^{e(c+dx)}}\,dx$

Optimal. Leaf size=75

$$\frac{H^{t(r+sx)}\,{}_2F_1\left(1,-\frac{st\log(H)}{de\log(F)};1-\frac{st\log(H)}{de\log(F)};-\frac{aF^{-e(c+dx)}}{b}\right)}{bst\log(H)}$$

```
[Out] H^(t*(s*x+r))*hypergeom([1, -s*t*ln(H)/d/e/ln(F)],[1-s*t*ln(H)/d/e/ln(F)],-
a/b/(F^(e*(d*x+c))))/b/s/t/ln(H)
```

Rubi [A]
time = 0.09, antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}} = 0.059$, Rules used = {2288, 2283}

$$\frac{H^{t(r+sx)}\,{}_2F_1\left(1,-\frac{st\log(H)}{de\log(F)};1-\frac{st\log(H)}{de\log(F)};-\frac{aF^{-e(c+dx)}}{b}\right)}{bst\log(H)}$$

Antiderivative was successfully verified.

```
[In] Int[(F^(e*(c + d*x))*H^(t*(r + s*x)))/(a + b*F^(e*(c + d*x))),x]
```

```
[Out] (H^(t*(r + s*x))*Hypergeometric2F1[1, -((s*t*Log[H])/(d*e*Log[F])), 1 - (s*
t*Log[H])/(d*e*Log[F]), -(a/(b*F^(e*(c + d*x))))])/(b*s*t*Log[H])
```

Rule 2283

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_)*(G_)^((h_.)*((f_.
) + (g_.)*(x_))), x_Symbol] :> Simp[a^p*(G^(h*(f + g*x))/(g*h*Log[G]))*Hype
rgeometric2F1[-p, g*h*(Log[G]/(d*e*Log[F])), g*h*(Log[G]/(d*e*Log[F])) + 1,
 Simplify[(-b/a)*F^(e*(c + d*x))]], x] /; FreeQ[{F, G, a, b, c, d, e, f, g,
 h, p}, x] && (ILtQ[p, 0] || GtQ[a, 0])
```

Rule 2288

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_)))*(H_)^((t_.)*((r_.) + (s_.)*(x_))), x_Symbol] :> Dist[G^((
f - c*(g/d))*h), Int[H^(t*(r + s*x))*(b + a/F^(e*(c + d*x)))^p, x], x] /; F
reeQ[{F, G, H, a, b, c, d, e, f, g, h, r, s, t}, x] && EqQ[d*e*p*Log[F] + g
*h*Log[G], 0] && IntegerQ[p]
```

Rubi steps

$$\int \frac{F^{e(c+dx)}H^{t(r+sx)}}{a+bF^{e(c+dx)}}\,dx = \int \frac{H^{t(r+sx)}}{b+aF^{-e(c+dx)}}\,dx$$
$$= \frac{H^{t(r+sx)}\,{}_2F_1\left(1,-\frac{st\log(H)}{de\log(F)};1-\frac{st\log(H)}{de\log(F)};-\frac{aF^{-e(c+dx)}}{b}\right)}{bst\log(H)}$$

Mathematica [A]
time = 0.17, size = 75, normalized size = 1.00

$$-\frac{H^{t(r+sx)}\left(-1+{}_2F_1\left(1,\frac{st\log(H)}{de\log(F)};1+\frac{st\log(H)}{de\log(F)};-\frac{bF^{e(c+dx)}}{a}\right)\right)}{bst\log(H)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(F^(e*(c + d*x))*H^(t*(r + s*x)))/(a + b*F^(e*(c + d*x))),x]
```

```
[Out] -((H^(t*(r + s*x))*(-1 + Hypergeometric2F1[1, (s*t*Log[H])/(d*e*Log[F]), 1
+ (s*t*Log[H])/(d*e*Log[F]), -((b*F^(e*(c + d*x)))/a)]))/(b*s*t*Log[H]))
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{F^{e(dx+c)}H^{t(sx+r)}}{a+b\,F^{e(dx+c)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(e*(d*x+c))*H^(t*(s*x+r))/(a+b*F^(e*(d*x+c))),x)
```

```
[Out] int(F^(e*(d*x+c))*H^(t*(s*x+r))/(a+b*F^(e*(d*x+c))),x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e*(d*x+c))*H^(t*(s*x+r))/(a+b*F^(e*(d*x+c))),x, algorithm="max
ima")
```

```
[Out] -H^(r*t)*a^2*d*e*integrate(H^(s*t*x)/(a^2*b*d*e*log(F) - a^2*b*s*t*log(H) +
 (F^(2*c*e)*b^3*d*e*log(F) - F^(2*c*e)*b^3*s*t*log(H))*F^(2*d*e*x) + 2*(F^(
c*e)*a*b^2*d*e*log(F) - F^(c*e)*a*b^2*s*t*log(H))*F^(d*e*x)), x)*log(F) + (
H^(r*t)*a*d*e*log(F) + (F^(c*e)*H^(r*t)*b*d*e*log(F) - F^(c*e)*H^(r*t)*b*s*
```

```
t*log(H))*F^(d*e*x))*H^(s*t*x)/(a*b*d*e*s*t*log(F)*log(H) - a*b*s^2*t^2*log
(H)^2 + (F^(c*e)*b^2*d*e*s*t*log(F)*log(H) - F^(c*e)*b^2*s^2*t^2*log(H)^2)*
F^(d*e*x))
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e*(d*x+c))*H^(t*(s*x+r))/(a+b*F^(e*(d*x+c))),x, algorithm="fri
cas")
```

```
[Out] integral(F^((d*x + c)*e)*H^(s*t*x + r*t)/(F^((d*x + c)*e)*b + a), x)
```

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

$$\int \frac{F^{e(c+dx)}H^{t(r+sx)}}{F^{ce}F^{dex}b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(e*(d*x+c))*H**(t*(s*x+r))/(a+b*F**(e*(d*x+c))),x)
```

```
[Out] Integral(F**(e*(c + d*x))*H**(t*(r + s*x))/(F**(c*e)*F**(d*e*x)*b + a), x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e*(d*x+c))*H^(t*(s*x+r))/(a+b*F^(e*(d*x+c))),x, algorithm="gia
c")
```

```
[Out] integrate(F^((d*x + c)*e)*H^((s*x + r)*t)/(F^((d*x + c)*e)*b + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{F^{e\,(c+d\,x)}\,H^{t\,(r+s\,x)}}{a+F^{e\,(c+d\,x)}\,b}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((F^(e*(c + d*x))*H^(t*(r + s*x)))/(a + F^(e*(c + d*x))*b),x)
```

```
[Out] int((F^(e*(c + d*x))*H^(t*(r + s*x)))/(a + F^(e*(c + d*x))*b), x)
```

3.68 $\int \frac{F^{e(f+dx)}H^{t(r+sx)}}{a+bF^{e(c+dx)}}\,dx$

Optimal. Leaf size=85

$$\frac{F^{-e(c-f)}H^{t(r+sx)}\,{}_2F_1\left(1,-\frac{st\log(H)}{de\log(F)};1-\frac{st\log(H)}{de\log(F)};-\frac{aF^{-e(c+dx)}}{b}\right)}{bst\log(H)}$$

```
[Out] H^(t*(s*x+r))*hypergeom([1, -s*t*ln(H)/d/e/ln(F)],[1-s*t*ln(H)/d/e/ln(F)],-
a/b/(F^(e*(d*x+c))))/b/(F^(e*(c-f)))/s/t/ln(H)
```

Rubi [A]
time = 0.09, antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}} = 0.059$, Rules used = {2288, 2283}

$$\frac{F^{-e(c-f)}H^{t(r+sx)}\,{}_2F_1\left(1,-\frac{st\log(H)}{de\log(F)};1-\frac{st\log(H)}{de\log(F)};-\frac{aF^{-e(c+dx)}}{b}\right)}{bst\log(H)}$$

Antiderivative was successfully verified.

```
[In] Int[(F^(e*(f + d*x))*H^(t*(r + s*x)))/(a + b*F^(e*(c + d*x))),x]
```

```
[Out] (H^(t*(r + s*x))*Hypergeometric2F1[1, -((s*t*Log[H])/(d*e*Log[F])), 1 - (s*
t*Log[H])/(d*e*Log[F]), -(a/(b*F^(e*(c + d*x))))])/(b*F^(e*(c - f))*s*t*Log
[H])
```

Rule 2283

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_)*(G_)^((h_.)*((f_.
) + (g_.)*(x_))), x_Symbol] :> Simp[a^p*(G^(h*(f + g*x))/(g*h*Log[G]))*Hype
rgeometric2F1[-p, g*h*(Log[G]/(d*e*Log[F])), g*h*(Log[G]/(d*e*Log[F])) + 1,
 Simplify[(-b/a)*F^(e*(c + d*x))]], x] /; FreeQ[{F, G, a, b, c, d, e, f, g,
 h, p}, x] && (ILtQ[p, 0] || GtQ[a, 0])
```

Rule 2288

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_)))*(H_)^((t_.)*((r_.) + (s_.)*(x_))), x_Symbol] :> Dist[G^((
f - c*(g/d))*h), Int[H^(t*(r + s*x))*(b + a/F^(e*(c + d*x)))^p, x], x] /; F
reeQ[{F, G, H, a, b, c, d, e, f, g, h, r, s, t}, x] && EqQ[d*e*p*Log[F] + g
*h*Log[G], 0] && IntegerQ[p]
```

Rubi steps

$$\int \frac{F^{e(f+dx)}H^{t(r+sx)}}{a+bF^{e(c+dx)}}\,dx = F^{-e(c-f)}\int \frac{H^{t(r+sx)}}{b+aF^{-e(c+dx)}}\,dx$$
$$= \frac{F^{-e(c-f)}H^{t(r+sx)}\,{}_2F_1\left(1,-\frac{st\log(H)}{de\log(F)};1-\frac{st\log(H)}{de\log(F)};-\frac{aF^{-e(c+dx)}}{b}\right)}{bst\log(H)}$$

Mathematica [A]
time = 0.19, size = 84, normalized size = 0.99

$$-\frac{F^{e(-c+f)}H^{t(r+sx)}\left(-1+\,{}_2F_1\left(1,\frac{st\log(H)}{de\log(F)};1+\frac{st\log(H)}{de\log(F)};-\frac{bF^{e(c+dx)}}{a}\right)\right)}{bst\log(H)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(F^(e*(f + d*x))*H^(t*(r + s*x)))/(a + b*F^(e*(c + d*x))),x]
```

```
[Out] -((F^(e*(-c + f))*H^(t*(r + s*x))*(-1 + Hypergeometric2F1[1, (s*t*Log[H])/(
d*e*Log[F]), 1 + (s*t*Log[H])/(d*e*Log[F]), -((b*F^(e*(c + d*x)))/a)]))/(b*
s*t*Log[H]))
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{F^{e(dx+f)}H^{t(sx+r)}}{a+b\,F^{e(dx+c)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(e*(d*x+f))*H^(t*(s*x+r))/(a+b*F^(e*(d*x+c))),x)
```

```
[Out] int(F^(e*(d*x+f))*H^(t*(s*x+r))/(a+b*F^(e*(d*x+c))),x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e*(d*x+f))*H^(t*(s*x+r))/(a+b*F^(e*(d*x+c))),x, algorithm="max
ima")
```

```
[Out] -F^(e*f)*H^(r*t)*a^2*d*e*integrate(H^(s*t*x)/(F^(c*e)*a^2*b*d*e*log(F) - F^
(c*e)*a^2*b*s*t*log(H) + (F^(3*c*e)*b^3*d*e*log(F) - F^(3*c*e)*b^3*s*t*log(
H))*F^(2*d*e*x) + 2*(F^(2*c*e)*a*b^2*d*e*log(F) - F^(2*c*e)*a*b^2*s*t*log(H
```

```
))*F^(d*e*x)), x)*log(F) + (F^(e*f)*H^(r*t)*a*d*e*log(F) + (F^(c*e + e*f)*H
^(r*t)*b*d*e*log(F) - F^(c*e + e*f)*H^(r*t)*b*s*t*log(H))*F^(d*e*x))*H^(s*t
*x)/(F^(c*e)*a*b*d*e*s*t*log(F)*log(H) - F^(c*e)*a*b*s^2*t^2*log(H)^2 + (F^
(2*c*e)*b^2*d*e*s*t*log(F)*log(H) - F^(2*c*e)*b^2*s^2*t^2*log(H)^2)*F^(d*e*
x))
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e*(d*x+f))*H^(t*(s*x+r))/(a+b*F^(e*(d*x+c))),x, algorithm="fri
cas")
```

```
[Out] integral(F^((d*x + f)*e)*H^(s*t*x + r*t)/(F^((d*x + c)*e)*b + a), x)
```

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

$$\int \frac{F^{e(dx+f)}H^{t(r+sx)}}{F^{ce}F^{dex}b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(e*(d*x+f))*H**(t*(s*x+r))/(a+b*F**(e*(d*x+c))),x)
```

```
[Out] Integral(F**(e*(d*x + f))*H**(t*(r + s*x))/(F**(c*e)*F**(d*e*x)*b + a), x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e*(d*x+f))*H^(t*(s*x+r))/(a+b*F^(e*(d*x+c))),x, algorithm="gia
c")
```

```
[Out] integrate(F^((d*x + f)*e)*H^((s*x + r)*t)/(F^((d*x + c)*e)*b + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{F^{e\,(f+d\,x)}\,H^{t\,(r+s\,x)}}{a+F^{e\,(c+d\,x)}\,b}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((F^(e*(f + d*x))*H^(t*(r + s*x)))/(a + F^(e*(c + d*x))*b),x)
```

```
[Out] int((F^(e*(f + d*x))*H^(t*(r + s*x)))/(a + F^(e*(c + d*x))*b), x)
```

3.69 $\int f^{a+bx^2} x^m \, dx$

Optimal. Leaf size=46

$$-\frac{1}{2}f^a x^{1+m}\Gamma\left(\frac{1+m}{2}, -bx^2 \log(f)\right) \left(-bx^2 \log(f)\right)^{\frac{1}{2}(-1-m)}$$

```
[Out] -1/2*f^a*x^(1+m)*GAMMA(1/2+1/2*m,-b*x^2*ln(f))*(-b*x^2*ln(f))^(-1/2-1/2*m)
```

Rubi [A]
time = 0.02, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$-\frac{1}{2}f^a x^{m+1}\left(-bx^2 \log(f)\right)^{\frac{1}{2}(-m-1)} \text{Gamma}\left(\frac{m+1}{2}, -bx^2 \log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x^m,x]
```

```
[Out] -1/2*(f^a*x^(1 + m)*Gamma[(1 + m)/2, -(b*x^2*Log[f])]*(-(b*x^2*Log[f]))^((-
1 - m)/2))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^2} x^m \, dx = -\frac{1}{2}f^a x^{1+m}\Gamma\left(\frac{1+m}{2}, -bx^2 \log(f)\right) \left(-bx^2 \log(f)\right)^{\frac{1}{2}(-1-m)}$$

Mathematica [A]
time = 0.02, size = 46, normalized size = 1.00

$$-\frac{1}{2}f^a x^{1+m}\Gamma\left(\frac{1+m}{2}, -bx^2 \log(f)\right) \left(-bx^2 \log(f)\right)^{\frac{1}{2}(-1-m)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x^m,x]
```

```
[Out] -1/2*(f^a*x^(1 + m)*Gamma[(1 + m)/2, -(b*x^2*Log[f])]*(-(b*x^2*Log[f]))^((-
1 - m)/2))
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 139 vs. $2(38) = 76$.
time = 0.03, size = 140, normalized size = 3.04

method	result
meijerg	$\frac{f^{a}(-b)^{-\frac{m}{2}-\frac{1}{2}} \ln(f)^{-\frac{m}{2}-\frac{1}{2}} \left(\frac{2x^{1+m}(-b)^{\frac{m}{2}+\frac{1}{2}} \ln(f)^{\frac{m}{2}+\frac{1}{2}} \left(\frac{m}{2}+\frac{1}{2}\right)\left(-b\,x^{2} \ln(f)\right)^{-\frac{m}{2}-\frac{1}{2}} \Gamma\left(\frac{m}{2}+\frac{1}{2}\right)}{1+m}+\frac{2x^{1+m}(-b)^{\frac{m}{2}+\frac{1}{2}} \ln(f)^{\frac{m}{2}+\frac{1}{2}} \left(-\frac{m}{2}-\right.}{}\right.}{2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x^m,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*f^a*(-b)^(-1/2*m-1/2)*ln(f)^(-1/2*m-1/2)*(2/(1+m)*x^(1+m)*(-b)^(1/2*m+1
/2)*ln(f)^(1/2*m+1/2)*(1/2*m+1/2)*(-b*x^2*ln(f))^(-1/2*m-1/2)*GAMMA(1/2*m+1
/2)+2/(1+m)*x^(1+m)*(-b)^(1/2*m+1/2)*ln(f)^(1/2*m+1/2)*(-1/2*m-1/2)*(-b*x^2
*ln(f))^(-1/2*m-1/2)*GAMMA(1/2*m+1/2,-b*x^2*ln(f)))
```

Maxima [A]
time = 0.06, size = 38, normalized size = 0.83

$$-\frac{1}{2} \left(-bx^{2} \log\left(f\right)\right)^{-\frac{1}{2} m-\frac{1}{2}} f^{a} x^{m+1} \Gamma\left(\frac{1}{2} m + \frac{1}{2}, -bx^{2} \log\left(f\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^m,x, algorithm="maxima")
```

```
[Out] -1/2*(-b*x^2*log(f))^(-1/2*m - 1/2)*f^a*x^(m + 1)*gamma(1/2*m + 1/2, -b*x^2
*log(f))
```

Fricas [A]
time = 0.11, size = 40, normalized size = 0.87

$$\frac{e^{\left(-\frac{1}{2}\,(m-1)\log(-b\log(f))+a\log(f)\right)}\Gamma\left(\frac{1}{2}\,m+\frac{1}{2}, -bx^{2}\log\left(f\right)\right)}{2\,b\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^m,x, algorithm="fricas")
```

```
[Out] 1/2*e^(-1/2*(m - 1)*log(-b*log(f)) + a*log(f))*gamma(1/2*m + 1/2, -b*x^2*lo
g(f))/(b*log(f))
```

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

$$\int f^{a+bx^{2}} x^{m}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x**m,x)
```

```
[Out] Integral(f**(a + b*x**2)*x**m, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^m,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^2 + a)*x^m, x)
```

Mupad [B]
time = 3.63, size = 49, normalized size = 1.07

$$\frac{f^a\,x^{m+1}\,\left(\Gamma\left(\frac{m}{2}+\frac{1}{2}\right)-\Gamma\left(\frac{m}{2}+\frac{1}{2},-b\,x^2\,\ln\left(f\right)\right)\right)}{2\,{\left(-b\,x^2\,\ln\left(f\right)\right)}^{\frac{m}{2}+\frac{1}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x^m,x)
```

```
[Out] (f^a*x^(m + 1)*(gamma(m/2 + 1/2) - igamma(m/2 + 1/2, -b*x^2*log(f))))/(2*(-
b*x^2*log(f))^(m/2 + 1/2))
```

3.70 $\int f^{a+bx^2} x^{11} \, dx$

Optimal. Leaf size=78

$$-\frac{f^{a+bx^2}\left(120-120bx^2\log(f)+60b^2x^4\log^2(f)-20b^3x^6\log^3(f)+5b^4x^8\log^4(f)-b^5x^{10}\log^5(f)\right)}{2b^6\log^6(f)}$$

```
[Out] -1/2*f^(b*x^2+a)*(120-120*b*x^2*ln(f)+60*b^2*x^4*ln(f)^2-20*b^3*x^6*ln(f)^3
+5*b^4*x^8*ln(f)^4-b^5*x^10*ln(f)^5)/b^6/ln(f)^6
```

Rubi [A]
time = 0.04, antiderivative size = 78, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2249}

$$-\frac{f^{a+bx^2}\left(-b^5x^{10}\log^5(f)+5b^4x^8\log^4(f)-20b^3x^6\log^3(f)+60b^2x^4\log^2(f)-120bx^2\log(f)+120\right)}{2b^6\log^6(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x^11,x]
```

```
[Out] -1/2*(f^(a + b*x^2)*(120 - 120*b*x^2*Log[f] + 60*b^2*x^4*Log[f]^2 - 20*b^3*
x^6*Log[f]^3 + 5*b^4*x^8*Log[f]^4 - b^5*x^10*Log[f]^5))/(b^6*Log[f]^6)
```

Rule 2249

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> With[{p = Simplify[(m + 1)/n]}, Simp[(-F^a)*((f/d)^m/(d*n*
((-b)*Log[F])^p))*Simplify[FunctionExpand[Gamma[p, (-b)*(c + d*x)^n*Log[F]]
]], x] /; IGtQ[p, 0]] /; FreeQ[{F, a, b, c, d, e, f, m, n}, x] && EqQ[d*e -
 c*f, 0] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\int f^{a+bx^2} x^{11} \, dx = -\frac{f^a \Gamma(6,-bx^2\log(f))}{2b^6\log^6(f)}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.03, size = 24, normalized size = 0.31

$$-\frac{f^a \Gamma(6,-bx^2\log(f))}{2b^6\log^6(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x^11,x]
```

```
[Out] -1/2*(f^a*Gamma[6, -(b*x^2*Log[f])])/(b^6*Log[f]^6)
```

Maple [A]
time = 0.03, size = 76, normalized size = 0.97

method	result
gosper	$\frac{\left(b^{5} x^{10} \ln \left(f \right)^{5}-5 b^{4} x^{8} \ln \left(f \right)^{4}+20 b^{3} x^{6} \ln \left(f \right)^{3}-60 b^{2} x^{4} \ln \left(f \right)^{2}+120 b \,x^{2} \ln \left(f \right)-120\right) f^{b \,x^{2}+a}}{2 \ln \left(f \right)^{6} b^{6}}$
risch	$\frac{\left(b^{5} x^{10} \ln \left(f \right)^{5}-5 b^{4} x^{8} \ln \left(f \right)^{4}+20 b^{3} x^{6} \ln \left(f \right)^{3}-60 b^{2} x^{4} \ln \left(f \right)^{2}+120 b \,x^{2} \ln \left(f \right)-120\right) f^{b \,x^{2}+a}}{2 \ln \left(f \right)^{6} b^{6}}$
meijerg	$\frac{f^{a} \left(120-\frac{\left(-6 b^{5} x^{10} \ln \left(f \right)^{5}+30 b^{4} x^{8} \ln \left(f \right)^{4}-120 b^{3} x^{6} \ln \left(f \right)^{3}+360 b^{2} x^{4} \ln \left(f \right)^{2}-720 b \,x^{2} \ln \left(f \right)+720\right) {\mathrm e}^{b \,x^{2} \ln \left(f \right)}}{6}\right)}{2 b^{6} \ln \left(f \right)^{6}}$
norman	$-\frac{60 \,{\mathrm e}^{\left(b \,x^{2}+a \right) \ln \left(f \right)}}{b^{6} \ln \left(f \right)^{6}}+\frac{60 x^{2} {\mathrm e}^{\left(b \,x^{2}+a \right) \ln \left(f \right)}}{b^{5} \ln \left(f \right)^{5}}+\frac{x^{10} {\mathrm e}^{\left(b \,x^{2}+a \right) \ln \left(f \right)}}{2 b \ln \left(f \right)}-\frac{30 x^{4} {\mathrm e}^{\left(b \,x^{2}+a \right) \ln \left(f \right)}}{\ln \left(f \right)^{4} b^{4}}+\frac{10 x^{6} {\mathrm e}^{\left(b \,x^{2}+a \right) \ln \left(f \right)}}{\ln \left(f \right)^{3} b^{3}}-\frac{5 x^{8} {\mathrm e}^{\left(b \,x^{2}+a \right) \ln}}{2 \ln \left(f \right)^{2} b^{2}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x^11,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*(b^5*x^10*ln(f)^5-5*b^4*x^8*ln(f)^4+20*b^3*x^6*ln(f)^3-60*b^2*x^4*ln(f)
^2+120*b*x^2*ln(f)-120)*f^(b*x^2+a)/ln(f)^6/b^6
```

Maxima [A]
time = 0.30, size = 92, normalized size = 1.18

$$\frac{\left(b^{5} f^{a} x^{10} \log\left(f\right)^{5} - 5 \, b^{4} f^{a} x^{8} \log\left(f\right)^{4} + 20 \, b^{3} f^{a} x^{6} \log\left(f\right)^{3} - 60 \, b^{2} f^{a} x^{4} \log\left(f\right)^{2} + 120 \, b f^{a} x^{2} \log\left(f\right) - 120 \, f^{a}\right)} f^{b x^{2}}}{2 \, b^{6} \log\left(f\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^11,x, algorithm="maxima")
```

```
[Out] 1/2*(b^5*f^a*x^10*log(f)^5 - 5*b^4*f^a*x^8*log(f)^4 + 20*b^3*f^a*x^6*log(f)
^3 - 60*b^2*f^a*x^4*log(f)^2 + 120*b*f^a*x^2*log(f) - 120*f^a)*f^(b*x^2)/(b
^6*log(f)^6)
```

Fricas [A]
time = 0.35, size = 75, normalized size = 0.96

$$\frac{{\left(b^{5} x^{10} \log\left(f\right)^{5} - 5 \, b^{4} x^{8} \log\left(f\right)^{4} + 20 \, b^{3} x^{6} \log\left(f\right)^{3} - 60 \, b^{2} x^{4} \log\left(f\right)^{2} + 120 \, b x^{2} \log\left(f\right) - 120\right)} f^{b x^{2} + a}}{2 \, b^{6} \log\left(f\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^11,x, algorithm="fricas")
```

```
[Out] 1/2*(b^5*x^10*log(f)^5 - 5*b^4*x^8*log(f)^4 + 20*b^3*x^6*log(f)^3 - 60*b^2*
x^4*log(f)^2 + 120*b*x^2*log(f) - 120)*f^(b*x^2 + a)/(b^6*log(f)^6)
```

Sympy [A]
time = 0.06, size = 94, normalized size = 1.21

$$\begin{cases} \frac{f^{a+bx^2}\left(b^5x^{10}\log{(f)}^5-5b^4x^8\log{(f)}^4+20b^3x^6\log{(f)}^3-60b^2x^4\log{(f)}^2+120bx^2\log{(f)}-120\right)}{2b^6\log{(f)}^6} & \text{for } b^6\log{(f)}^6\neq 0 \\ \frac{x^{12}}{12} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x**11,x)
```

```
[Out] Piecewise((f**(a + b*x**2)*(b**5*x**10*log(f)**5 - 5*b**4*x**8*log(f)**4 +
20*b**3*x**6*log(f)**3 - 60*b**2*x**4*log(f)**2 + 120*b*x**2*log(f) - 120)/
(2*b**6*log(f)**6), Ne(b**6*log(f)**6, 0)), (x**12/12, True))
```

Giac [A]
time = 4.20, size = 79, normalized size = 1.01

$$\frac{\left(b^5x^{10}\log{(f)}^5-5\,b^4x^8\log{(f)}^4+20\,b^3x^6\log{(f)}^3-60\,b^2x^4\log{(f)}^2+120\,bx^2\log{(f)}-120\right)e^{\left(bx^2\log(f)+a\log(f)\right)}}{2\,b^6\log{(f)}^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^11,x, algorithm="giac")
```

```
[Out] 1/2*(b^5*x^10*log(f)^5 - 5*b^4*x^8*log(f)^4 + 20*b^3*x^6*log(f)^3 - 60*b^2*
x^4*log(f)^2 + 120*b*x^2*log(f) - 120)*e^(b*x^2*log(f) + a*log(f))/(b^6*log
(f)^6)
```

Mupad [B]
time = 3.56, size = 76, normalized size = 0.97

$$-\frac{f^{b\,x^2+a}\,\left(-\frac{b^5\,x^{10}\,\ln(f)^5}{2}+\frac{5\,b^4\,x^8\,\ln(f)^4}{2}-10\,b^3\,x^6\,\ln{(f)}^3+30\,b^2\,x^4\,\ln{(f)}^2-60\,b\,x^2\,\ln{(f)}+60\right)}{b^6\,\ln{(f)}^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x^11,x)
```

```
[Out] -(f^(a + b*x^2)*(30*b^2*x^4*log(f)^2 - 10*b^3*x^6*log(f)^3 + (5*b^4*x^8*log
(f)^4)/2 - (b^5*x^10*log(f)^5)/2 - 60*b*x^2*log(f) + 60))/(b^6*log(f)^6)
```

3.71 $\int f^{a+bx^2} x^9 \, dx$

Optimal. Leaf size=65

$$\frac{f^{a+bx^2}(24-24bx^2\log(f)+12b^2x^4\log^2(f)-4b^3x^6\log^3(f)+b^4x^8\log^4(f))}{2b^5\log^5(f)}$$

```
[Out] 1/2*f^(b*x^2+a)*(24-24*b*x^2*ln(f)+12*b^2*x^4*ln(f)^2-4*b^3*x^6*ln(f)^3+b^4
*x^8*ln(f)^4)/b^5/ln(f)^5
```

Rubi [A]
time = 0.02, antiderivative size = 65, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2249}

$$\frac{f^{a+bx^2}\left(b^4x^8\log^4(f)-4b^3x^6\log^3(f)+12b^2x^4\log^2(f)-24bx^2\log(f)+24\right)}{2b^5\log^5(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x^9,x]
```

```
[Out] (f^(a + b*x^2)*(24 - 24*b*x^2*Log[f] + 12*b^2*x^4*Log[f]^2 - 4*b^3*x^6*Log[
f]^3 + b^4*x^8*Log[f]^4))/(2*b^5*Log[f]^5)
```

Rule 2249

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> With[{p = Simplify[(m + 1)/n]}, Simp[(-F^a)*((f/d)^m/(d*n*
((-b)*Log[F])^p))*Simplify[FunctionExpand[Gamma[p, (-b)*(c + d*x)^n*Log[F]]
]], x] /; IGtQ[p, 0]] /; FreeQ[{F, a, b, c, d, e, f, m, n}, x] && EqQ[d*e -
 c*f, 0] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\int f^{a+bx^2}x^9\,dx=\frac{f^a\Gamma(5,-bx^2\log(f))}{2b^5\log^5(f)}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.03, size = 24, normalized size = 0.37

$$\frac{f^a\Gamma(5,-bx^2\log(f))}{2b^5\log^5(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x^9,x]
```

```
[Out] (f^a*Gamma[5, -(b*x^2*Log[f])])/(2*b^5*Log[f]^5)
```

Maple [A]
time = 0.02, size = 64, normalized size = 0.98

method	result	size
gosper	$\frac{f^{b\,x^{2}+a} \left(24-24 b\,x^{2} \ln \left(f \right)+12 b^{2} x^{4} \ln \left(f \right)^{2}-4 b^{3} x^{6} \ln \left(f \right)^{3}+b^{4} x^{8} \ln \left(f \right)^{4}\right)}{2 b^{5} \ln \left(f \right)^{5}}$	64
risch	$\frac{f^{b\,x^{2}+a} \left(24-24 b\,x^{2} \ln \left(f \right)+12 b^{2} x^{4} \ln \left(f \right)^{2}-4 b^{3} x^{6} \ln \left(f \right)^{3}+b^{4} x^{8} \ln \left(f \right)^{4}\right)}{2 b^{5} \ln \left(f \right)^{5}}$	64
meijerg	$-\frac{f^{a} \left(24-\frac{\left(5 b^{4} x^{8} \ln \left(f \right)^{4}-20 b^{3} x^{6} \ln \left(f \right)^{3}+60 b^{2} x^{4} \ln \left(f \right)^{2}-120 b\,x^{2} \ln \left(f \right)+120\right) {\mathrm e}^{b\,x^{2} \ln \left(f \right)}}{5}\right)}{2 b^{5} \ln \left(f \right)^{5}}$	71
norman	$\frac{12 \,{\mathrm e}^{\left(b\,x^{2}+a \right) \ln \left(f \right)}}{b^{5} \ln \left(f \right)^{5}}+\frac{x^{8} {\mathrm e}^{\left(b\,x^{2}+a \right) \ln \left(f \right)}}{2 b \ln \left(f \right)}-\frac{12 x^{2} {\mathrm e}^{\left(b\,x^{2}+a \right) \ln \left(f \right)}}{\ln \left(f \right)^{4} b^{4}}+\frac{6 x^{4} {\mathrm e}^{\left(b\,x^{2}+a \right) \ln \left(f \right)}}{\ln \left(f \right)^{3} b^{3}}-\frac{2 x^{6} {\mathrm e}^{\left(b\,x^{2}+a \right) \ln \left(f \right)}}{\ln \left(f \right)^{2} b^{2}}$	114

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x^9,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*f^(b*x^2+a)*(24-24*b*x^2*ln(f)+12*b^2*x^4*ln(f)^2-4*b^3*x^6*ln(f)^3+b^4
*x^8*ln(f)^4)/b^5/ln(f)^5
```

Maxima [A]
time = 0.29, size = 77, normalized size = 1.18

$$\frac{\left(b^{4} f^{a} x^{8} \log\left(f\right)^{4} - 4 \, b^{3} f^{a} x^{6} \log\left(f\right)^{3} + 12 \, b^{2} f^{a} x^{4} \log\left(f\right)^{2} - 24 \, b f^{a} x^{2} \log\left(f\right) + 24 \, f^{a}\right)} f^{b x^{2}}}{2 \, b^{5} \log\left(f\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^9,x, algorithm="maxima")
```

```
[Out] 1/2*(b^4*f^a*x^8*log(f)^4 - 4*b^3*f^a*x^6*log(f)^3 + 12*b^2*f^a*x^4*log(f)^
2 - 24*b*f^a*x^2*log(f) + 24*f^a)*f^(b*x^2)/(b^5*log(f)^5)
```

Fricas [A]
time = 0.36, size = 63, normalized size = 0.97

$$\frac{{\left(b^{4} x^{8} \log\left(f\right)^{4} - 4 \, b^{3} x^{6} \log\left(f\right)^{3} + 12 \, b^{2} x^{4} \log\left(f\right)^{2} - 24 \, b x^{2} \log\left(f\right) + 24\right)} f^{b x^{2} + a}}{2 \, b^{5} \log\left(f\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^9,x, algorithm="fricas")
```

```
[Out] 1/2*(b^4*x^8*log(f)^4 - 4*b^3*x^6*log(f)^3 + 12*b^2*x^4*log(f)^2 - 24*b*x^2
*log(f) + 24)*f^(b*x^2 + a)/(b^5*log(f)^5)
```

Sympy [A]
time = 0.05, size = 80, normalized size = 1.23

$$\begin{cases} \frac{f^{a+bx^2}\left(b^4x^8\log(f)^4-4b^3x^6\log(f)^3+12b^2x^4\log(f)^2-24bx^2\log(f)+24\right)}{2b^5\log(f)^5} & \text{for } b^5\log(f)^5\neq 0 \\ \frac{x^{10}}{10} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x**9,x)
```

```
[Out] Piecewise((f**(a + b*x**2)*(b**4*x**8*log(f)**4 - 4*b**3*x**6*log(f)**3 + 1
2*b**2*x**4*log(f)**2 - 24*b*x**2*log(f) + 24)/(2*b**5*log(f)**5), Ne(b**5*
log(f)**5, 0)), (x**10/10, True))
```

Giac [A]
time = 3.44, size = 67, normalized size = 1.03

$$\frac{\left(b^4x^8\log(f)^4-4\,b^3x^6\log(f)^3+12\,b^2x^4\log(f)^2-24\,bx^2\log(f)+24\right)e^{\left(bx^2\log(f)+a\log(f)\right)}}{2\,b^5\log(f)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^9,x, algorithm="giac")
```

```
[Out] 1/2*(b^4*x^8*log(f)^4 - 4*b^3*x^6*log(f)^3 + 12*b^2*x^4*log(f)^2 - 24*b*x^2
*log(f) + 24)*e^(b*x^2*log(f) + a*log(f))/(b^5*log(f)^5)
```

Mupad [B]
time = 3.54, size = 63, normalized size = 0.97

$$\frac{f^{b\,x^2+a}\,\left(\frac{b^4\,x^8\,\ln(f)^4}{2}-2\,b^3\,x^6\ln(f)^3+6\,b^2\,x^4\ln(f)^2-12\,b\,x^2\,\ln(f)+12\right)}{b^5\ln(f)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x^9,x)
```

```
[Out] (f^(a + b*x^2)*(6*b^2*x^4*log(f)^2 - 2*b^3*x^6*log(f)^3 + (b^4*x^8*log(f)^4
)/2 - 12*b*x^2*log(f) + 12))/(b^5*log(f)^5)
```

3.72 $\int f^{a+bx^2} x^7 \, dx$

Optimal. Leaf size=86

$$-\frac{3f^{a+bx^2}}{b^4\log^4(f)}+\frac{3f^{a+bx^2}x^2}{b^3\log^3(f)}-\frac{3f^{a+bx^2}x^4}{2b^2\log^2(f)}+\frac{f^{a+bx^2}x^6}{2b\log(f)}$$

```
[Out] -3*f^(b*x^2+a)/b^4/ln(f)^4+3*f^(b*x^2+a)*x^2/b^3/ln(f)^3-3/2*f^(b*x^2+a)*x^
4/b^2/ln(f)^2+1/2*f^(b*x^2+a)*x^6/b/ln(f)
```

Rubi [A]
time = 0.06, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2243, 2240}

$$-\frac{3f^{a+bx^2}}{b^4\log^4(f)}+\frac{3x^2f^{a+bx^2}}{b^3\log^3(f)}-\frac{3x^4f^{a+bx^2}}{2b^2\log^2(f)}+\frac{x^6f^{a+bx^2}}{2b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x^7,x]
```

```
[Out] (-3*f^(a + b*x^2))/(b^4*Log[f]^4) + (3*f^(a + b*x^2)*x^2)/(b^3*Log[f]^3) -
(3*f^(a + b*x^2)*x^4)/(2*b^2*Log[f]^2) + (f^(a + b*x^2)*x^6)/(2*b*Log[f])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int f^{a+bx^2}x^7\,dx = \frac{f^{a+bx^2}x^6}{2b\log(f)} - \frac{3\int f^{a+bx^2}x^5\,dx}{b\log(f)}$$
$$= -\frac{3f^{a+bx^2}x^4}{2b^2\log^2(f)} + \frac{f^{a+bx^2}x^6}{2b\log(f)} + \frac{6\int f^{a+bx^2}x^3\,dx}{b^2\log^2(f)}$$
$$= \frac{3f^{a+bx^2}x^2}{b^3\log^3(f)} - \frac{3f^{a+bx^2}x^4}{2b^2\log^2(f)} + \frac{f^{a+bx^2}x^6}{2b\log(f)} - \frac{6\int f^{a+bx^2}x\,dx}{b^3\log^3(f)}$$
$$= -\frac{3f^{a+bx^2}}{b^4\log^4(f)} + \frac{3f^{a+bx^2}x^2}{b^3\log^3(f)} - \frac{3f^{a+bx^2}x^4}{2b^2\log^2(f)} + \frac{f^{a+bx^2}x^6}{2b\log(f)}$$

Mathematica [A]
time = 0.03, size = 53, normalized size = 0.62

$$\frac{f^{a+bx^2}\left(-6+6bx^2\log(f)-3b^2x^4\log^2(f)+b^3x^6\log^3(f)\right)}{2b^4\log^4(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x^7,x]
```

```
[Out] (f^(a + b*x^2)*(-6 + 6*b*x^2*Log[f] - 3*b^2*x^4*Log[f]^2 + b^3*x^6*Log[f]^3
))/(2*b^4*Log[f]^4)
```

Maple [A]
time = 0.02, size = 52, normalized size = 0.60

method	result	size
gosper	$\frac{\left(b^3x^6\ln(f)^3-3b^2x^4\ln(f)^2+6b\,x^2\ln(f)-6\right)f^{b\,x^2+a}}{2\ln(f)^4b^4}$	52
risch	$\frac{\left(b^3x^6\ln(f)^3-3b^2x^4\ln(f)^2+6b\,x^2\ln(f)-6\right)f^{b\,x^2+a}}{2\ln(f)^4b^4}$	52
meijerg	$\frac{f^a\left(6-\frac{\left(-4b^3x^6\ln(f)^3+12b^2x^4\ln(f)^2-24b\,x^2\ln(f)+24\right)e^{b\,x^2\ln(f)}}{4}\right)}{2b^4\ln(f)^4}$	59
norman	$-\frac{3\,e^{\left(b\,x^2+a\right)\ln(f)}}{\ln(f)^4b^4}+\frac{x^6e^{\left(b\,x^2+a\right)\ln(f)}}{2b\ln(f)}+\frac{3x^2e^{\left(b\,x^2+a\right)\ln(f)}}{\ln(f)^3b^3}-\frac{3x^4e^{\left(b\,x^2+a\right)\ln(f)}}{2\ln(f)^2b^2}$	91

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x^7,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*(b^3*x^6*ln(f)^3-3*b^2*x^4*ln(f)^2+6*b*x^2*ln(f)-6)*f^(b*x^2+a)/ln(f)^4
/b^4
```

Maxima [A]
time = 0.28, size = 62, normalized size = 0.72

$$\frac{\left(b^{3} f^{a} x^{6} \log\left(f\right)^{3} - 3\, b^{2} f^{a} x^{4} \log\left(f\right)^{2} + 6\, b f^{a} x^{2} \log\left(f\right) - 6\, f^{a}\right) f^{b x^{2}}}{2\, b^{4} \log\left(f\right)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^7,x, algorithm="maxima")
```

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

Fricas [A]
time = 0.35, size = 51, normalized size = 0.59

$$\frac{\left(b^{3} x^{6} \log\left(f\right)^{3} - 3\, b^{2} x^{4} \log\left(f\right)^{2} + 6\, b x^{2} \log\left(f\right) - 6\right) f^{b x^{2} + a}}{2\, b^{4} \log\left(f\right)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^7,x, algorithm="fricas")
```

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

Sympy [A]
time = 0.05, size = 66, normalized size = 0.77

$$\begin{cases} \frac{f^{a + b x^{2}} \left(b^{3} x^{6} \log\left(f\right)^{3} - 3 b^{2} x^{4} \log\left(f\right)^{2} + 6 b x^{2} \log\left(f\right) - 6\right)}{2 b^{4} \log\left(f\right)^{4}} & \text{for}\: b^{4} \log\left(f\right)^{4} \neq 0 \\ \frac{x^{8}}{8} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x**7,x)
```

```
[Out] Piecewise((f**(a + b*x**2)*(b**3*x**6*log(f)**3 - 3*b**2*x**4*log(f)**2 + 6
*b*x**2*log(f) - 6)/(2*b**4*log(f)**4), Ne(b**4*log(f)**4, 0)), (x**8/8, Tr
ue))
```

Giac [A]
time = 3.35, size = 55, normalized size = 0.64

$$\frac{\left(b^{3} x^{6} \log\left(f\right)^{3} - 3\, b^{2} x^{4} \log\left(f\right)^{2} + 6\, b x^{2} \log\left(f\right) - 6\right) e^{\left(b x^{2} \log\left(f\right) + a \log\left(f\right)\right)}}{2\, b^{4} \log\left(f\right)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^7,x, algorithm="giac")
```

```
[Out] 1/2*(b^3*x^6*log(f)^3 - 3*b^2*x^4*log(f)^2 + 6*b*x^2*log(f) - 6)*e^(b*x^2*l
og(f) + a*log(f))/(b^4*log(f)^4)
```

Mupad [B]
time = 3.50, size = 52, normalized size = 0.60

$$-\frac{f^{b\,x^2+a}\,\left(-\frac{b^3\,x^6\,\ln(f)^3}{2}+\frac{3\,b^2\,x^4\,\ln(f)^2}{2}-3\,b\,x^2\,\ln\left(f\right)+3\right)}{b^4\,\ln\left(f\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x^7,x)
```

```
[Out] -(f^(a + b*x^2)*((3*b^2*x^4*log(f)^2)/2 - (b^3*x^6*log(f)^3)/2 - 3*b*x^2*lo
g(f) + 3))/(b^4*log(f)^4)
```

3.73 $\int f^{a+bx^2}x^5\,dx$

Optimal. Leaf size=62

$$\frac{f^{a+bx^2}}{b^3\log^3(f)}-\frac{f^{a+bx^2}x^2}{b^2\log^2(f)}+\frac{f^{a+bx^2}x^4}{2b\log(f)}$$

```
[Out] f^(b*x^2+a)/b^3/ln(f)^3-f^(b*x^2+a)*x^2/b^2/ln(f)^2+1/2*f^(b*x^2+a)*x^4/b/l
n(f)
```

Rubi [A]
time = 0.04, antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2243, 2240}

$$\frac{f^{a+bx^2}}{b^3\log^3(f)}-\frac{x^2f^{a+bx^2}}{b^2\log^2(f)}+\frac{x^4f^{a+bx^2}}{2b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x^5,x]
```

```
[Out] f^(a + b*x^2)/(b^3*Log[f]^3) - (f^(a + b*x^2)*x^2)/(b^2*Log[f]^2) + (f^(a +
 b*x^2)*x^4)/(2*b*Log[f])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int f^{a+bx^2}x^5\,dx = \frac{f^{a+bx^2}x^4}{2b\log(f)} - \frac{2\int f^{a+bx^2}x^3\,dx}{b\log(f)}$$
$$= -\frac{f^{a+bx^2}x^2}{b^2\log^2(f)} + \frac{f^{a+bx^2}x^4}{2b\log(f)} + \frac{2\int f^{a+bx^2}x\,dx}{b^2\log^2(f)}$$
$$= \frac{f^{a+bx^2}}{b^3\log^3(f)} - \frac{f^{a+bx^2}x^2}{b^2\log^2(f)} + \frac{f^{a+bx^2}x^4}{2b\log(f)}$$

Mathematica [A]
time = 0.03, size = 41, normalized size = 0.66

$$\frac{f^{a+bx^2}\left(2-2bx^2\log(f)+b^2x^4\log^2(f)\right)}{2b^3\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x^5,x]
[Out] (f^(a + b*x^2)*(2 - 2*b*x^2*Log[f] + b^2*x^4*Log[f]^2))/(2*b^3*Log[f]^3)
```

Maple [A]
time = 0.02, size = 40, normalized size = 0.65

method	result	size
gosper	$\frac{\left(b^2x^4\ln(f)^2-2b\,x^2\ln(f)+2\right)f^{b\,x^2+a}}{2\ln(f)^3b^3}$	40
risch	$\frac{\left(b^2x^4\ln(f)^2-2b\,x^2\ln(f)+2\right)f^{b\,x^2+a}}{2\ln(f)^3b^3}$	40
meijerg	$-\frac{f^a\left(2-\frac{\left(3b^2x^4\ln(f)^2-6b\,x^2\ln(f)+6\right)e^{b\,x^2\ln(f)}}{3}\right)}{2b^3\ln(f)^3}$	47
norman	$\frac{e^{\left(b\,x^2+a\right)\ln(f)}}{\ln(f)^3b^3}+\frac{x^4e^{\left(b\,x^2+a\right)\ln(f)}}{2b\ln(f)}-\frac{x^2e^{\left(b\,x^2+a\right)\ln(f)}}{\ln(f)^2b^2}$	67

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x^5,x,method=_RETURNVERBOSE)
[Out] 1/2*(b^2*x^4*ln(f)^2-2*b*x^2*ln(f)+2)*f^(b*x^2+a)/ln(f)^3/b^3
```

Maxima [A]
time = 0.28, size = 47, normalized size = 0.76

$$\frac{\left(b^2f^ax^4\log\left(f\right)^2-2\,bf^ax^2\log\left(f\right)+2\,f^a\right)f^{bx^2}}{2\,b^3\log\left(f\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A]
time = 0.35, size = 39, normalized size = 0.63

$$\frac{\left(b^2x^4\log\left(f\right)^2-2\,bx^2\log\left(f\right)+2\right)f^{bx^2+a}}{2\,b^3\log\left(f\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A]
time = 0.05, size = 53, normalized size = 0.85

$$\begin{cases} \frac{f^{a+bx^2}\left(b^2x^4\log\left(f\right)^2-2bx^2\log\left(f\right)+2\right)}{2b^3\log\left(f\right)^3} & \text{for } b^3\log\left(f\right)^3\neq 0 \\ \frac{x^6}{6} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x**5,x)
```

```
[Out] Piecewise((f**(a + b*x**2)*(b**2*x**4*log(f)**2 - 2*b*x**2*log(f) + 2)/(2*b
**3*log(f)**3), Ne(b**3*log(f)**3, 0)), (x**6/6, True))
```

Giac [A]
time = 4.18, size = 43, normalized size = 0.69

$$\frac{\left(b^2x^4\log\left(f\right)^2-2\,bx^2\log\left(f\right)+2\right)e^{\left(bx^2\log(f)+a\log(f)\right)}}{2\,b^3\log\left(f\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*(b^2*x^4*log(f)^2 - 2*b*x^2*log(f) + 2)*e^(b*x^2*log(f) + a*log(f))/(b^
3*log(f)^3)
```

Mupad [B]
time = 3.51, size = 39, normalized size = 0.63

$$\frac{f^{b\,x^2+a}\,\left(\frac{b^2\,x^4\,\ln(f)^2}{2}-b\,x^2\,\ln\left(f\right)+1\right)}{b^3\,\ln\left(f\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x^5,x)
```

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

3.74 $\int f^{a+bx^2} x^3\,dx$

Optimal. Leaf size=44

$$-\frac{f^{a+bx^2}}{2b^2\log^2(f)}+\frac{f^{a+bx^2}x^2}{2b\log(f)}$$

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

Rubi [A]
time = 0.03, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2243, 2240}

$$\frac{x^2 f^{a+bx^2}}{2b\log(f)}-\frac{f^{a+bx^2}}{2b^2\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x^3,x]
```

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

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\begin{aligned}\int f^{a+bx^2}x^3\,dx&=\frac{f^{a+bx^2}x^2}{2b\log(f)}-\frac{\int f^{a+bx^2}x\,dx}{b\log(f)}\\&=-\frac{f^{a+bx^2}}{2b^2\log^2(f)}+\frac{f^{a+bx^2}x^2}{2b\log(f)}\end{aligned}$$

Mathematica [A]
time = 0.03, size = 29, normalized size = 0.66

$$\frac{f^{a+bx^2}\left(-1+bx^2\log(f)\right)}{2b^2\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x^3,x]
```

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

Maple [A]
time = 0.01, size = 28, normalized size = 0.64

method	result	size
gosper	$\frac{\left(b\,x^{2}\ln\left(f\right)-1\right)f^{b\,x^{2}+a}}{2\ln\left(f\right)^{2}b^{2}}$	28
risch	$\frac{\left(b\,x^{2}\ln\left(f\right)-1\right)f^{b\,x^{2}+a}}{2\ln\left(f\right)^{2}b^{2}}$	28
meijerg	$\frac{f^{a}\left(1-\frac{\left(2-2b\,x^{2}\ln\left(f\right)\right)\mathrm{e}^{b\,x^{2}\ln\left(f\right)}}{2}\right)}{2b^{2}\ln\left(f\right)^{2}}$	35
norman	$-\frac{\mathrm{e}^{\left(b\,x^{2}+a\right)\ln\left(f\right)}}{2\ln\left(f\right)^{2}b^{2}}+\frac{x^{2}\mathrm{e}^{\left(b\,x^{2}+a\right)\ln\left(f\right)}}{2b\ln\left(f\right)}$	45

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x^3,x,method=_RETURNVERBOSE)
```

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

Maxima [A]
time = 0.28, size = 32, normalized size = 0.73

$$\frac{\left(bf^{a}x^{2}\log\left(f\right)-f^{a}\right)f^{bx^{2}}}{2\,b^{2}\log\left(f\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^3,x, algorithm="maxima")
```

```
[Out] 1/2*(b*f^a*x^2*log(f) - f^a)*f^(b*x^2)/(b^2*log(f)^2)
```

Fricas [A]
time = 0.36, size = 27, normalized size = 0.61

$$\frac{\left(bx^{2}\log\left(f\right)-1\right)f^{bx^{2}+a}}{2\,b^{2}\log\left(f\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^3,x, algorithm="fricas")
```

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

Sympy [A]
time = 0.04, size = 39, normalized size = 0.89

$$\begin{cases} \frac{f^{a+bx^2}(bx^2\log(f)-1)}{2b^2\log(f)^2} & \text{for } b^2\log(f)^2 \neq 0 \\ \frac{x^4}{4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x**3,x)
```

```
[Out] Piecewise((f**(a + b*x**2)*(b*x**2*log(f) - 1)/(2*b**2*log(f)**2), Ne(b**2*
log(f)**2, 0)), (x**4/4, True))
```

Giac [C] Result contains complex when optimal does not.
time = 3.15, size = 689, normalized size = 15.66

$$\frac{1}{2}\left(2\left(\frac{(\pi bx^2\mathrm{sgn}(f)-\pi bx^2)(\pi b^2\log(|f|)\mathrm{sgn}(f)-\pi b^2\log(|f|))}{(\pi^2b^2\mathrm{sgn}(f)-\pi^2b^2+2b^2\log(|f|)^2)^2+4(\pi b^2\log(|f|)\mathrm{sgn}(f)-\pi b^2\log(|f|))^2}+\frac{(\pi^2b^2\mathrm{sgn}(f)-\pi^2b^2+2b^2\log(|f|)^2)(bx^2\log(|f|)-1)}{(\pi^2b^2\mathrm{sgn}(f)-\pi^2b^2+2b^2\log(|f|)^2)^2+4(\pi b^2\log(|f|)\mathrm{sgn}(f)-\pi b^2\log(|f|))^2}\right)\cos\left(-\frac{1}{2}\pi bx^2\mathrm{sgn}(f)+\frac{1}{2}\pi bx^2-\frac{1}{2}\pi a\mathrm{sgn}(f)+\frac{1}{2}\pi a\right)+\left(\frac{(\pi^2b^2\mathrm{sgn}(f)-\pi^2b^2+2b^2\log(|f|)^2)(\pi bx^2\mathrm{sgn}(f)-\pi bx^2)}{(\pi^2b^2\mathrm{sgn}(f)-\pi^2b^2+2b^2\log(|f|)^2)^2+4(\pi b^2\log(|f|)\mathrm{sgn}(f)-\pi b^2\log(|f|))^2}-\frac{4(\pi b^2\log(|f|)\mathrm{sgn}(f)-\pi b^2\log(|f|))(bx^2\log(|f|)-1)}{(\pi^2b^2\mathrm{sgn}(f)-\pi^2b^2+2b^2\log(|f|)^2)^2+4(\pi b^2\log(|f|)\mathrm{sgn}(f)-\pi b^2\log(|f|))^2}\right)\sin\left(-\frac{1}{2}\pi bx^2\mathrm{sgn}(f)+\frac{1}{2}\pi bx^2-\frac{1}{2}\pi a\mathrm{sgn}(f)+\frac{1}{2}\pi a\right)\right)e^{(bx^2\log(|f|)+a\log(|f|))}-\frac{1}{4}i\left(\frac{(\pi bx^2\mathrm{sgn}(f)-\pi bx^2-2ibx^2\log(|f|)+2i)e^{(\frac{1}{2}i\pi bx^2\mathrm{sgn}(f)-\frac{1}{2}i\pi bx^2+\frac{1}{2}i\pi a\mathrm{sgn}(f)-\frac{1}{2}i\pi a)}}{\pi^2b^2\mathrm{sgn}(f)+2i\pi b^2\log(|f|)\mathrm{sgn}(f)-\pi^2b^2-2i\pi b^2\log(|f|)+2b^2\log(|f|)^2}+\frac{(\pi bx^2\mathrm{sgn}(f)-\pi bx^2+2ibx^2\log(|f|)-2i)e^{(-\frac{1}{2}i\pi bx^2\mathrm{sgn}(f)+\frac{1}{2}i\pi bx^2-\frac{1}{2}i\pi a\mathrm{sgn}(f)+\frac{1}{2}i\pi a)}}{\pi^2b^2\mathrm{sgn}(f)-2i\pi b^2\log(|f|)\mathrm{sgn}(f)-\pi^2b^2+2i\pi b^2\log(|f|)+2b^2\log(|f|)^2}\right)e^{(bx^2\log(|f|)+a\log(|f|))}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^3,x, algorithm="giac")
```

```
[Out] 1/2*(2*((pi*b*x^2*sgn(f) - pi*b*x^2)*(pi*b^2*log(abs(f))*sgn(f) - pi*b^2*lo
g(abs(f)))/((pi^2*b^2*sgn(f) - pi^2*b^2 + 2*b^2*log(abs(f))^2)^2 + 4*(pi*b^
2*log(abs(f))*sgn(f) - pi*b^2*log(abs(f)))^2) + (pi^2*b^2*sgn(f) - pi^2*b^2
 + 2*b^2*log(abs(f))^2)*(b*x^2*log(abs(f)) - 1)/((pi^2*b^2*sgn(f) - pi^2*b^
2 + 2*b^2*log(abs(f))^2)^2 + 4*(pi*b^2*log(abs(f))*sgn(f) - pi*b^2*log(abs(
f)))^2))*cos(-1/2*pi*b*x^2*sgn(f) + 1/2*pi*b*x^2 - 1/2*pi*a*sgn(f) + 1/2*pi
*a) + ((pi^2*b^2*sgn(f) - pi^2*b^2 + 2*b^2*log(abs(f))^2)*(pi*b*x^2*sgn(f)
- pi*b*x^2)/((pi^2*b^2*sgn(f) - pi^2*b^2 + 2*b^2*log(abs(f))^2)^2 + 4*(pi*b
^2*log(abs(f))*sgn(f) - pi*b^2*log(abs(f)))^2) - 4*(pi*b^2*log(abs(f))*sgn(
f) - pi*b^2*log(abs(f)))*(b*x^2*log(abs(f)) - 1)/((pi^2*b^2*sgn(f) - pi^2*b
^2 + 2*b^2*log(abs(f))^2)^2 + 4*(pi*b^2*log(abs(f))*sgn(f) - pi*b^2*log(abs
(f)))^2))*sin(-1/2*pi*b*x^2*sgn(f) + 1/2*pi*b*x^2 - 1/2*pi*a*sgn(f) + 1/2*p
i*a))*e^(b*x^2*log(abs(f)) + a*log(abs(f))) - 1/4*I*((pi*b*x^2*sgn(f) - pi*
b*x^2 - 2*I*b*x^2*log(abs(f)) + 2*I)*e^(1/2*I*pi*b*x^2*sgn(f) - 1/2*I*pi*b*
x^2 + 1/2*I*pi*a*sgn(f) - 1/2*I*pi*a)/(pi^2*b^2*sgn(f) + 2*I*pi*b^2*log(abs
(f))*sgn(f) - pi^2*b^2 - 2*I*pi*b^2*log(abs(f)) + 2*b^2*log(abs(f))^2) + (p
i*b*x^2*sgn(f) - pi*b*x^2 + 2*I*b*x^2*log(abs(f)) - 2*I)*e^(-1/2*I*pi*b*x^2
*sgn(f) + 1/2*I*pi*b*x^2 - 1/2*I*pi*a*sgn(f) + 1/2*I*pi*a)/(pi^2*b^2*sgn(f)
 - 2*I*pi*b^2*log(abs(f))*sgn(f) - pi^2*b^2 + 2*I*pi*b^2*log(abs(f)) + 2*b^
2*log(abs(f))^2))*e^(b*x^2*log(abs(f)) + a*log(abs(f)))
```

Mupad [B]
time = 3.46, size = 27, normalized size = 0.61

$$\frac{f^{b\,x^2+a}\,\left(\frac{b\,x^2\,\ln(f)}{2}-\frac{1}{2}\right)}{b^2\,\ln\left(f\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x^3,x)
[Out] (f^(a + b*x^2)*((b*x^2*log(f))/2 - 1/2))/(b^2*log(f)^2)
```

3.75 $\int f^{a+bx^2} x \, dx$

Optimal. Leaf size=20

$$\frac{f^{a+bx^2}}{2b\log(f)}$$

[Out] 1/2*f^(b*x^2+a)/b/ln(f)

Rubi [A]
time = 0.01, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = $\{2240\}$

$$\frac{f^{a+bx^2}}{2b\log(f)}$$

Antiderivative was successfully verified.

[In] Int[f^(a + b*x^2)*x,x]

[Out] f^(a + b*x^2)/(2*b*Log[f])

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^2} x \, dx = \frac{f^{a+bx^2}}{2b\log(f)}$$

Mathematica [A]
time = 0.02, size = 20, normalized size = 1.00

$$\frac{f^{a+bx^2}}{2b\log(f)}$$

Antiderivative was successfully verified.

[In] Integrate[f^(a + b*x^2)*x,x]

[Out] f^(a + b*x^2)/(2*b*Log[f])

Maple [A]
time = 0.02, size = 19, normalized size = 0.95

method	result	size
gosper	$\frac{f^{b\,x^{2}+a}}{2b\ln\left(f\right)}$	19
derivativedivides	$\frac{f^{b\,x^{2}+a}}{2b\ln\left(f\right)}$	19
default	$\frac{f^{b\,x^{2}+a}}{2b\ln\left(f\right)}$	19
risch	$\frac{f^{b\,x^{2}+a}}{2b\ln\left(f\right)}$	19
norman	$\frac{\mathrm{e}^{\left(b\,x^{2}+a\right)\ln\left(f\right)}}{2b\ln\left(f\right)}$	21
meijerg	$-\frac{f^{a}\left(1-\mathrm{e}^{b\,x^{2}\ln\left(f\right)}\right)}{2b\ln\left(f\right)}$	25

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x,x,method=_RETURNVERBOSE)
[Out] 1/2*f^(b*x^2+a)/b/ln(f)
```

Maxima [A]
time = 0.28, size = 18, normalized size = 0.90

$$\frac{f^{bx^2+a}}{2\,b\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x,x, algorithm="maxima")
[Out] 1/2*f^(b*x^2 + a)/(b*log(f))
```

Fricas [A]
time = 0.36, size = 18, normalized size = 0.90

$$\frac{f^{bx^2+a}}{2\,b\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x,x, algorithm="fricas")
[Out] 1/2*f^(b*x^2 + a)/(b*log(f))
```

Sympy [A]
time = 0.03, size = 22, normalized size = 1.10

$$\begin{cases} \frac{f^{a+bx^2}}{2b\log(f)} & \text{for } b\log(f) \neq 0 \\ \frac{x^2}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x,x)
[Out] Piecewise((f**(a + b*x**2)/(2*b*log(f)), Ne(b*log(f), 0)), (x**2/2, True))
```

Giac [A]
time = 4.58, size = 18, normalized size = 0.90

$$\frac{f^{bx^2+a}}{2\,b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x,x, algorithm="giac")
[Out] 1/2*f^(b*x^2 + a)/(b*log(f))
```

Mupad [B]
time = 3.30, size = 18, normalized size = 0.90

$$\frac{f^{b\,x^2+a}}{2\,b\,\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x,x)
[Out] f^(a + b*x^2)/(2*b*log(f))
```

3.76 $\int \frac{f^{a+bx^2}}{x}\,dx$

Optimal. Leaf size=15

$$\frac{1}{2}f^a\text{Ei}\left(bx^2\log(f)\right)$$

[Out] 1/2*f^a*Ei(b*x^2*ln(f))

Rubi [A]
time = 0.01, antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2241}

$$\frac{1}{2}f^a\text{Ei}\left(bx^2\log(f)\right)$$

Antiderivative was successfully verified.

[In] Int[f^(a + b*x^2)/x,x]

[Out] (f^a*ExpIntegralEi[b*x^2*Log[f]])/2

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^2}}{x}\,dx = \frac{1}{2}f^a\text{Ei}\left(bx^2\log(f)\right)$$

Mathematica [A]
time = 0.02, size = 15, normalized size = 1.00

$$\frac{1}{2}f^a\text{Ei}\left(bx^2\log(f)\right)$$

Antiderivative was successfully verified.

[In] Integrate[f^(a + b*x^2)/x,x]

[Out] (f^a*ExpIntegralEi[b*x^2*Log[f]])/2

Maple [A]
time = 0.02, size = 16, normalized size = 1.07

method	result	size
risch	$-\frac{f^{a} \operatorname{expIntegral}\left(1,-b\,x^{2} \ln \left(f\right)\right)}{2}$	16
meijerg	$\frac{f^{a} \left(-\ln \left(-b\,x^{2} \ln \left(f\right)\right)-\operatorname{expIntegral}\left(1,-b\,x^{2} \ln \left(f\right)\right)+2 \ln \left(x\right)+\ln \left(-b\right)+\ln \left(\ln \left(f\right)\right)\right)}{2}$	41

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)/x,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*f^a*Ei(1,-b*x^2*ln(f))
```

Maxima [A]
time = 0.32, size = 13, normalized size = 0.87

$$\frac{1}{2}\,f^{a}{\rm Ei}\left(bx^{2}\log\left(f\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*f^a*Ei(b*x^2*log(f))
```

Fricas [A]
time = 0.42, size = 13, normalized size = 0.87

$$\frac{1}{2}\,f^{a}{\rm Ei}\left(bx^{2}\log\left(f\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*f^a*Ei(b*x^2*log(f))
```

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

$$\int \frac{f^{a+bx^{2}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)/x,x)
```

```
[Out] Integral(f**(a + b*x**2)/x, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^(b*x^2 + a)/x, x)
```

Mupad [B]
time = 3.18, size = 13, normalized size = 0.87

$$\frac{f^a\,\mathrm{ei}\left(b\,x^2\,\ln\left(f\right)\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)/x,x)
```

```
[Out] (f^a*ei(b*x^2*log(f)))/2
```

3.77 $\int \frac{f^{a+bx^2}}{x^3} \, dx$

Optimal. Leaf size=35

$$-\frac{f^{a+bx^2}}{2x^2}+\frac{1}{2}bf^a\text{Ei}\left(bx^2\log(f)\right)\log(f)$$

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

Rubi [A]
time = 0.03, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2245, 2241}

$$\frac{1}{2}bf^a\log(f)\text{Ei}\left(bx^2\log(f)\right)-\frac{f^{a+bx^2}}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)/x^3,x]
```

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

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int \frac{f^{a+bx^2}}{x^3}\,dx &= -\frac{f^{a+bx^2}}{2x^2}+(b\log(f))\int \frac{f^{a+bx^2}}{x}\,dx\\ &= -\frac{f^{a+bx^2}}{2x^2}+\frac{1}{2}bf^a\text{Ei}\left(bx^2\log(f)\right)\log(f)\end{aligned}$$

Mathematica [A]
time = 0.04, size = 32, normalized size = 0.91

$$\frac{1}{2}f^a\left(-\frac{f^{bx^2}}{x^2}+b\text{Ei}\left(bx^2\log(f)\right)\log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)/x^3,x]
[Out] (f^a*(-(f^(b*x^2)/x^2) + b*ExpIntegralEi[b*x^2*Log[f]]*Log[f]))/2
```

Maple [A]
time = 0.02, size = 35, normalized size = 1.00

method	result	s
risch	$-\frac{f^a f^{b x^2}}{2x^2}-\frac{f^a \ln(f) b\,\text{expIntegral}\left(1,-b x^2\ln(f)\right)}{2}$	3
meijerg	$-\frac{f^a b\ln(f)\left(-\frac{2+2b x^2\ln(f)}{2b x^2\ln(f)}+\frac{e^{b x^2\ln(f)}}{b x^2\ln(f)}+\ln\left(-b x^2\ln(f)\right)+\text{expIntegral}\left(1,-b x^2\ln(f)\right)+1-2\ln(x)-\ln(-b)-\ln(\ln(f))+\frac{1}{b x^2\ln(f)}\right)}{2}$	9

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)/x^3,x,method=_RETURNVERBOSE)
[Out] -1/2*f^a/x^2*f^(b*x^2)-1/2*f^a*ln(f)*b*Ei(1,-b*x^2*ln(f))
```

Maxima [A]
time = 0.32, size = 18, normalized size = 0.51

$$\frac{1}{2}\,bf^a\Gamma\left(-1,-bx^2\log\left(f\right)\right)\log\left(f\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^3,x, algorithm="maxima")
[Out] 1/2*b*f^a*gamma(-1, -b*x^2*log(f))*log(f)
```

Fricas [A]
time = 0.36, size = 35, normalized size = 1.00

$$\frac{bf^a x^2\text{Ei}(bx^2\log\left(f\right))\log\left(f\right)-f^{bx^2+a}}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^3,x, algorithm="fricas")
[Out] 1/2*(b*f^a*x^2*Ei(b*x^2*log(f))*log(f) - f^(b*x^2 + a))/x^2
```

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

$$\int \frac{f^{a+bx^2}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)/x**3,x)
[Out] Integral(f**(a + b*x**2)/x**3, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^3,x, algorithm="giac")
[Out] integrate(f^(b*x^2 + a)/x^3, x)
```

Mupad [B]
time = 3.43, size = 32, normalized size = 0.91

$$-\frac{f^a\,\left(f^{b\,x^2}+b\,x^2\,\ln\left(f\right)\,\mathrm{expint}\left(-b\,x^2\,\ln\left(f\right)\right)\right)}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)/x^3,x)
[Out] -(f^a*(f^(b*x^2) + b*x^2*log(f)*expint(-b*x^2*log(f))))/(2*x^2)
```

3.78 $\int \frac{f^{a+bx^2}}{x^5}\,dx$

Optimal. Leaf size=58

$$-\frac{f^{a+bx^2}}{4x^4}-\frac{bf^{a+bx^2}\log(f)}{4x^2}+\frac{1}{4}b^2f^a\text{Ei}\big(bx^2\log(f)\big)\log^2(f)$$

```
[Out] -1/4*f^(b*x^2+a)/x^4-1/4*b*f^(b*x^2+a)*ln(f)/x^2+1/4*b^2*f^a*Ei(b*x^2*ln(f)
)*ln(f)^2
```

Rubi [A]
time = 0.05, antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2245, 2241}

$$\frac{1}{4}b^2f^a\log^2(f)\text{Ei}\big(bx^2\log(f)\big)-\frac{b\log(f)f^{a+bx^2}}{4x^2}-\frac{f^{a+bx^2}}{4x^4}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)/x^5,x]
```

```
[Out] -1/4*f^(a + b*x^2)/x^4 - (b*f^(a + b*x^2)*Log[f])/(4*x^2) + (b^2*f^a*ExpInt
egralEi[b*x^2*Log[f]]*Log[f]^2)/4
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$
\begin{aligned}
\int \frac{f^{a+bx^2}}{x^5} dx &= -\frac{f^{a+bx^2}}{4x^4} + \frac{1}{2}(b\log(f)) \int \frac{f^{a+bx^2}}{x^3} dx \\
&= -\frac{f^{a+bx^2}}{4x^4} - \frac{bf^{a+bx^2}\log(f)}{4x^2} + \frac{1}{2}\left(b^2\log^2(f)\right) \int \frac{f^{a+bx^2}}{x} dx \\
&= -\frac{f^{a+bx^2}}{4x^4} - \frac{bf^{a+bx^2}\log(f)}{4x^2} + \frac{1}{4}b^2 f^a \text{Ei}\left(bx^2\log(f)\right)\log^2(f)
\end{aligned}
$$

Mathematica [A]
time = 0.04, size = 48, normalized size = 0.83

$$
\frac{f^a\left(b^2x^4\text{Ei}(bx^2\log(f))\log^2(f) - f^{bx^2}(1+bx^2\log(f))\right)}{4x^4}
$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)/x^5,x]
```

```
[Out] (f^a*(b^2*x^4*ExpIntegralEi[b*x^2*Log[f]]*Log[f]^2 - f^(b*x^2)*(1 + b*x^2*L
og[f])))/(4*x^4)
```

Maple [A]
time = 0.03, size = 57, normalized size = 0.98

method	result
risch	$-\frac{f^a f^{b\,x^2}}{4x^4}-\frac{f^a\ln(f) b\, f^{b\,x^2}}{4x^2}-\frac{f^a\ln(f)^2 b^2\,\text{expIntegral}\left(1,-b\,x^2\ln(f)\right)}{4}$
meijerg	$\frac{f^a b^2\ln(f)^2\left(\frac{9b^2x^4\ln(f)^2+12b\,x^2\ln(f)+6}{12b^2x^4\ln(f)^2}-\frac{\left(3+3b\,x^2\ln(f)\right)\mathrm{e}^{b\,x^2\ln(f)}}{6b^2x^4\ln(f)^2}-\frac{\ln\left(-b\,x^2\ln(f)\right)}{2}-\frac{\text{expIntegral}\left(1,-b\,x^2\ln(f)\right)}{2}-\frac{3}{4}+\ln(x)+\frac{\ln(-b)}{2}+\right.}{2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)/x^5,x,method=_RETURNVERBOSE)
```

```
[Out] -1/4*f^a/x^4*f^(b*x^2)-1/4*f^a*ln(f)*b/x^2*f^(b*x^2)-1/4*f^a*ln(f)^2*b^2*Ei
(1,-b*x^2*ln(f))
```

Maxima [A]
time = 0.32, size = 22, normalized size = 0.38

$$
-\frac{1}{2}\,b^2 f^a\Gamma\left(-2,-bx^2\log\left(f\right)\right)\log\left(f\right)^2
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^5,x, algorithm="maxima")
```

```
[Out] -1/2*b^2*f^a*gamma(-2, -b*x^2*log(f))*log(f)^2
```

Fricas [A]
time = 0.36, size = 48, normalized size = 0.83

$$\frac{b^2 f^a x^4 \mathrm{Ei}(bx^2 \log(f)) \log(f)^2 - (bx^2 \log(f) + 1) f^{bx^2+a}}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^5,x, algorithm="fricas")
```

```
[Out] 1/4*(b^2*f^a*x^4*Ei(b*x^2*log(f))*log(f)^2 - (b*x^2*log(f) + 1)*f^(b*x^2 +
a))/x^4
```

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

$$\int \frac{f^{a+bx^2}}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)/x**5,x)
```

```
[Out] Integral(f**(a + b*x**2)/x**5, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^5,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^2 + a)/x^5, x)
```

Mupad [B]
time = 3.53, size = 57, normalized size = 0.98

$$-\frac{b^2\,f^a\,\ln(f)^2\,\left(f^{b\,x^2}\,\left(\frac{1}{2\,b\,x^2\,\ln(f)}+\frac{1}{2\,b^2\,x^4\,\ln(f)^2}\right)+\frac{\mathrm{expint}\left(-b\,x^2\,\ln(f)\right)}{2}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)/x^5,x)
```

```
[Out] -(b^2*f^a*log(f)^2*(f^(b*x^2)*(1/(2*b*x^2*log(f)) + 1/(2*b^2*x^4*log(f)^2))
 + expint(-b*x^2*log(f))/2))/2
```

3.79 $\int \frac{f^{a+bx^2}}{x^7}\,dx$

Optimal. Leaf size=81

$$-\frac{f^{a+bx^2}}{6x^6}-\frac{bf^{a+bx^2}\log(f)}{12x^4}-\frac{b^2f^{a+bx^2}\log^2(f)}{12x^2}+\frac{1}{12}b^3f^a\text{Ei}\left(bx^2\log(f)\right)\log^3(f)$$

```
[Out] -1/6*f^(b*x^2+a)/x^6-1/12*b*f^(b*x^2+a)*ln(f)/x^4-1/12*b^2*f^(b*x^2+a)*ln(f
)^2/x^2+1/12*b^3*f^a*Ei(b*x^2*ln(f))*ln(f)^3
```

Rubi [A]
time = 0.07, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2245, 2241}

$$\frac{1}{12}b^3f^a\log^3(f)\text{Ei}\left(bx^2\log(f)\right)-\frac{b^2\log^2(f)f^{a+bx^2}}{12x^2}-\frac{f^{a+bx^2}}{6x^6}-\frac{b\log(f)f^{a+bx^2}}{12x^4}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)/x^7,x]
```

```
[Out] -1/6*f^(a + b*x^2)/x^6 - (b*f^(a + b*x^2)*Log[f])/(12*x^4) - (b^2*f^(a + b*
x^2)*Log[f]^2)/(12*x^2) + (b^3*f^a*ExpIntegralEi[b*x^2*Log[f]]*Log[f]^3)/12
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$
\begin{aligned}
\int \frac{f^{a+bx^2}}{x^7}\,dx &= -\frac{f^{a+bx^2}}{6x^6}+\frac{1}{3}(b\log(f))\int \frac{f^{a+bx^2}}{x^5}\,dx \\
&= -\frac{f^{a+bx^2}}{6x^6}-\frac{bf^{a+bx^2}\log(f)}{12x^4}+\frac{1}{6}\left(b^2\log^2(f)\right)\int \frac{f^{a+bx^2}}{x^3}\,dx \\
&= -\frac{f^{a+bx^2}}{6x^6}-\frac{bf^{a+bx^2}\log(f)}{12x^4}-\frac{b^2f^{a+bx^2}\log^2(f)}{12x^2}+\frac{1}{6}\left(b^3\log^3(f)\right)\int \frac{f^{a+bx^2}}{x}\,dx \\
&= -\frac{f^{a+bx^2}}{6x^6}-\frac{bf^{a+bx^2}\log(f)}{12x^4}-\frac{b^2f^{a+bx^2}\log^2(f)}{12x^2}+\frac{1}{12}b^3f^a\text{Ei}\left(bx^2\log(f)\right)\log^3(f)
\end{aligned}
$$

Mathematica [A]
time = 0.04, size = 59, normalized size = 0.73

$$
\frac{f^a\left(b^3x^6\text{Ei}(bx^2\log(f))\log^3(f)-f^{bx^2}\left(2+bx^2\log(f)+b^2x^4\log^2(f)\right)\right)}{12x^6}
$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)/x^7,x]
```

```
[Out] (f^a*(b^3*x^6*ExpIntegralEi[b*x^2*Log[f]]*Log[f]^3 - f^(b*x^2)*(2 + b*x^2*L
og[f] + b^2*x^4*Log[f]^2)))/(12*x^6)
```

Maple [A]
time = 0.04, size = 79, normalized size = 0.98

method	result
risch	$-\frac{f^a f^{b\,x^2}}{6x^6}-\frac{f^a\ln(f)b\,f^{b\,x^2}}{12x^4}-\frac{f^a\ln(f)^2b^2f^{b\,x^2}}{12x^2}-\frac{f^a\ln(f)^3b^3\,\mathrm{expIntegral}\left(1,-b\,x^2\ln(f)\right)}{12}$
meijerg	$-\frac{f^a b^3\ln(f)^3\left(-\frac{22b^3x^6\ln(f)^3+36b^2x^4\ln(f)^2+36b\,x^2\ln(f)+24}{72b^3x^6\ln(f)^3}+\frac{\left(4b^2x^4\ln(f)^2+4b\,x^2\ln(f)+8\right)\mathrm{e}^{b\,x^2\ln(f)}}{24b^3x^6\ln(f)^3}+\frac{\ln\left(-b\,x^2\ln(f)\right)}{6}+\frac{\mathrm{expIntegral}\left(1,-b\right.}{6}\right.}{2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)/x^7,x,method=_RETURNVERBOSE)
```

```
[Out] -1/6*f^a/x^6*f^(b*x^2)-1/12*f^a*ln(f)*b/x^4*f^(b*x^2)-1/12*f^a*ln(f)^2*b^2/
x^2*f^(b*x^2)-1/12*f^a*ln(f)^3*b^3*Ei(1,-b*x^2*ln(f))
```

Maxima [A]
time = 0.32, size = 22, normalized size = 0.27

$$
\frac{1}{2}\,b^3f^a\Gamma\left(-3,-bx^2\log\left(f\right)\right)\log\left(f\right)^3
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^7,x, algorithm="maxima")
```

```
[Out] 1/2*b^3*f^a*gamma(-3, -b*x^2*log(f))*log(f)^3
```

Fricas [A]
time = 0.37, size = 59, normalized size = 0.73

$$\frac{b^3 f^a x^6 \operatorname{Ei}(bx^2 \log(f)) \log(f)^3 - \left(b^2 x^4 \log(f)^2 + bx^2 \log(f) + 2\right) f^{bx^2+a}}{12\, x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^7,x, algorithm="fricas")
```

```
[Out] 1/12*(b^3*f^a*x^6*Ei(b*x^2*log(f))*log(f)^3 - (b^2*x^4*log(f)^2 + b*x^2*log
(f) + 2)*f^(b*x^2 + a))/x^6
```

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

$$\int \frac{f^{a+bx^2}}{x^7}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)/x**7,x)
```

```
[Out] Integral(f**(a + b*x**2)/x**7, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^7,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^2 + a)/x^7, x)
```

Mupad [B]
time = 3.54, size = 69, normalized size = 0.85

$$-\frac{b^3\, f^a \ln(f)^3 \left(f^{b\,x^2} \left(\frac{1}{6\,b\,x^2\,\ln(f)} + \frac{1}{6\,b^2\,x^4\,\ln(f)^2} + \frac{1}{3\,b^3\,x^6\,\ln(f)^3}\right) + \frac{\mathrm{expint}\left(-b\,x^2\,\ln(f)\right)}{6}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)/x^7,x)
```

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

3.80 $\int \frac{f^{a+bx^2}}{x^9} dx$

Optimal. Leaf size=24

$$-\frac{1}{2}b^4 f^a \Gamma\left(-4, -bx^2 \log(f)\right) \log^4(f)$$

```
[Out] -1/2*f^a/x^8*Ei(5,-b*x^2*ln(f))
```

Rubi [A]
time = 0.02, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$-\frac{1}{2}b^4 f^a \log^4(f)\text{Gamma}\left(-4, -bx^2 \log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)/x^9,x]
[Out] -1/2*(b^4*f^a*Gamma[-4, -(b*x^2*Log[f])]*Log[f]^4)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^2}}{x^9} dx = -\frac{1}{2}b^4 f^a \Gamma\left(-4, -bx^2 \log(f)\right) \log^4(f)$$

Mathematica [A]
time = 0.03, size = 24, normalized size = 1.00

$$-\frac{1}{2}b^4 f^a \Gamma\left(-4, -bx^2 \log(f)\right) \log^4(f)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)/x^9,x]
[Out] -1/2*(b^4*f^a*Gamma[-4, -(b*x^2*Log[f])]*Log[f]^4)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 100 vs. $2(18) = 36$.
time = 0.04, size = 101, normalized size = 4.21

method	result
risch	$-\frac{f^{a} f^{b \,x^{2}}}{8 x^{8}}-\frac{f^{a} \ln \left(f \right) b \,f^{b \,x^{2}}}{24 x^{6}}-\frac{f^{a} \ln \left(f \right)^{2} b^{2} f^{b \,x^{2}}}{48 x^{4}}-\frac{f^{a} \ln \left(f \right)^{3} b^{3} f^{b \,x^{2}}}{48 x^{2}}-\frac{f^{a} \ln \left(f \right)^{4} b^{4} \operatorname{expIntegral}\left(1, -b \,x^{2} \ln \left(f \right)\right)}{48}$
meijerg	$\frac{f^{a} b^{4} \ln \left(f \right)^{4} \left(\frac{125 b^{4} x^{8} \ln \left(f \right)^{4}+240 b^{3} x^{6} \ln \left(f \right)^{3}+360 b^{2} x^{4} \ln \left(f \right)^{2}+480 b \,x^{2} \ln \left(f \right)+360}{1440 b^{4} x^{8} \ln \left(f \right)^{4}}-\frac{\left(5 b^{3} x^{6} \ln \left(f \right)^{3}+5 b^{2} x^{4} \ln \left(f \right)^{2}+10 b \,x^{2} \ln \left(f \right)+30\right) {\mathrm e}^{b \,x^{2} \ln \left(f \right)}}{120 b^{4} x^{8} \ln \left(f \right)^{4}}- \cdots \right.}{2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)/x^9,x,method=_RETURNVERBOSE)
```

```
[Out] -1/8*f^a/x^8*f^(b*x^2)-1/24*f^a*ln(f)*b/x^6*f^(b*x^2)-1/48*f^a*ln(f)^2*b^2/
x^4*f^(b*x^2)-1/48*f^a*ln(f)^3*b^3/x^2*f^(b*x^2)-1/48*f^a*ln(f)^4*b^4*Ei(1,
-b*x^2*ln(f))
```

Maxima [A]
time = 0.06, size = 22, normalized size = 0.92

$$-\frac{1}{2}\, b^{4} f^{a} \Gamma\left(-4, -b x^{2} \log\left(f\right)\right) \log\left(f\right)^{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^9,x, algorithm="maxima")
```

```
[Out] -1/2*b^4*f^a*gamma(-4, -b*x^2*log(f))*log(f)^4
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 71 vs. $2(18) = 36$.
time = 0.09, size = 71, normalized size = 2.96

$$\frac{b^{4} f^{a} x^{8} {\rm Ei}\left(b x^{2} \log\left(f\right)\right) \log\left(f\right)^{4} - {\left(b^{3} x^{6} \log\left(f\right)^{3} + b^{2} x^{4} \log\left(f\right)^{2} + 2 \, b x^{2} \log\left(f\right) + 6\right)} f^{b x^{2} + a}}{48 \, x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^9,x, algorithm="fricas")
```

```
[Out] 1/48*(b^4*f^a*x^8*Ei(b*x^2*log(f))*log(f)^4 - (b^3*x^6*log(f)^3 + b^2*x^4*l
og(f)^2 + 2*b*x^2*log(f) + 6)*f^(b*x^2 + a))/x^8
```

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

$$\int \frac{f^{a + b x^{2}}}{x^{9}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)/x**9,x)
```

```
[Out] Integral(f**(a + b*x**2)/x**9, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^9,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^2 + a)/x^9, x)
```

Mupad [B]
time = 3.57, size = 90, normalized size = 3.75

$$-\frac{b^4\,f^a\ln\left(f\right)^4\mathrm{expint}(-b\,x^2\,\ln\left(f\right))}{48}-\frac{b^4\,f^a\,f^{b\,x^2}\ln\left(f\right)^4\left(\frac{1}{24\,b\,x^2\,\ln(f)}+\frac{1}{24\,b^2\,x^4\ln(f)^2}+\frac{1}{12\,b^3\,x^6\ln(f)^3}+\frac{1}{4\,b^4\,x^8\ln(f)^4}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)/x^9,x)
```

```
[Out] - (b^4*f^a*log(f)^4*expint(-b*x^2*log(f)))/48 - (b^4*f^a*f^(b*x^2)*log(f)^4
*(1/(24*b*x^2*log(f)) + 1/(24*b^2*x^4*log(f)^2) + 1/(12*b^3*x^6*log(f)^3) +
 1/(4*b^4*x^8*log(f)^4)))/2
```

3.81 $\int \frac{f^{a+bx^2}}{x^{11}}\,dx$

Optimal. Leaf size=24

$$\frac{1}{2}b^5 f^a \Gamma\left(-5,-bx^2\log(f)\right)\log^5(f)$$

```
[Out] -1/2*f^a/x^10*Ei(6,-b*x^2*ln(f))
```

Rubi [A]
time = 0.01, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = $\{2250\}$

$$\frac{1}{2}b^5 f^a \log^5(f)\text{Gamma}\left(-5,-bx^2\log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)/x^11,x]
```

```
[Out] (b^5*f^a*Gamma[-5, -(b*x^2*Log[f])]*Log[f]^5)/2
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^2}}{x^{11}}\,dx=\frac{1}{2}b^5 f^a \Gamma\left(-5,-bx^2\log(f)\right)\log^5(f)$$

Mathematica [A]
time = 0.03, size = 24, normalized size = 1.00

$$\frac{1}{2}b^5 f^a \Gamma\left(-5,-bx^2\log(f)\right)\log^5(f)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)/x^11,x]
```

```
[Out] (b^5*f^a*Gamma[-5, -(b*x^2*Log[f])]*Log[f]^5)/2
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 122 vs. $2(18) = 36$.
time = 0.06, size = 123, normalized size = 5.12

method	result
risch	$-\frac{f^a f^{b\,x^2}}{10x^{10}} - \frac{f^a \ln(f) b\, f^{b\,x^2}}{40x^8} - \frac{f^a \ln(f)^2 b^2 f^{b\,x^2}}{120x^6} - \frac{f^a \ln(f)^3 b^3 f^{b\,x^2}}{240x^4} - \frac{f^a \ln(f)^4 b^4 f^{b\,x^2}}{240x^2} - \frac{f^a \ln(f)^5 b^5 \operatorname{expIntegral}(1,-b\,x^2 \ln(}{240}$
meijerg	$-\frac{f^a b^5 \ln(f)^5 \left(-\frac{137b^5x^{10}\ln(f)^5+300b^4x^8\ln(f)^4+600b^3x^6\ln(f)^3+1200b^2x^4\ln(f)^2+1800b\,x^2\ln(f)+1440}{7200b^5x^{10}\ln(f)^5} + \frac{(6b^4x^8\ln(f)^4+6b^3x^6\ln(f)^3+12b^2x^4}{720b^5x^1}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)/x^11,x,method=_RETURNVERBOSE)
```

```
[Out] -1/10*f^a/x^10*f^(b*x^2)-1/40*f^a*ln(f)*b/x^8*f^(b*x^2)-1/120*f^a*ln(f)^2*b
^2/x^6*f^(b*x^2)-1/240*f^a*ln(f)^3*b^3/x^4*f^(b*x^2)-1/240*f^a*ln(f)^4*b^4/
x^2*f^(b*x^2)-1/240*f^a*ln(f)^5*b^5*Ei(1,-b*x^2*ln(f))
```

Maxima [A]
time = 0.06, size = 22, normalized size = 0.92

$$\frac{1}{2}\,b^5 f^a \Gamma\left(-5, -bx^2 \log\left(f\right)\right) \log\left(f\right)^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^11,x, algorithm="maxima")
```

```
[Out] 1/2*b^5*f^a*gamma(-5, -b*x^2*log(f))*log(f)^5
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 83 vs. $2(18) = 36$.
time = 0.08, size = 83, normalized size = 3.46

$$\frac{b^5 f^a x^{10} \mathrm{Ei}(bx^2 \log\left(f\right)) \log\left(f\right)^5 - \left(b^4 x^8 \log\left(f\right)^4 + b^3 x^6 \log\left(f\right)^3 + 2\,b^2 x^4 \log\left(f\right)^2 + 6\,bx^2 \log\left(f\right) + 24\right) f^{bx^2+a}}{240\,x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^11,x, algorithm="fricas")
```

```
[Out] 1/240*(b^5*f^a*x^10*Ei(b*x^2*log(f))*log(f)^5 - (b^4*x^8*log(f)^4 + b^3*x^6
*log(f)^3 + 2*b^2*x^4*log(f)^2 + 6*b*x^2*log(f) + 24)*f^(b*x^2 + a))/x^10
```

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

$$\int \frac{f^{a+bx^2}}{x^{11}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)/x**11,x)
```

```
[Out] Integral(f**(a + b*x**2)/x**11, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^11,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^2 + a)/x^11, x)
```

Mupad [B]
time = 3.51, size = 102, normalized size = 4.25

$$-\frac{b^5\,f^a\ln\left(f\right)^5\,\mathrm{expint}(-b\,x^2\,\ln\left(f\right))}{240}-\frac{b^5\,f^a\,f^{b\,x^2}\ln\left(f\right)^5\left(\frac{1}{120\,b\,x^2\,\ln(f)}+\frac{1}{120\,b^2\,x^4\ln(f)^2}+\frac{1}{60\,b^3\,x^6\ln(f)^3}+\frac{1}{20\,b^4\,x^8\ln(f)^4}+\frac{1}{5\,b^5\,x^{10}\ln(f)^5}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)/x^11,x)
```

```
[Out] - (b^5*f^a*log(f)^5*expint(-b*x^2*log(f)))/240 - (b^5*f^a*f^(b*x^2)*log(f)^
5*(1/(120*b*x^2*log(f)) + 1/(120*b^2*x^4*log(f)^2) + 1/(60*b^3*x^6*log(f)^3
) + 1/(20*b^4*x^8*log(f)^4) + 1/(5*b^5*x^10*log(f)^5)))/2
```

3.82 $\int f^{a+bx^2} x^{12}\, dx$

Optimal. Leaf size=34

$$-\frac{f^a x^{13} \Gamma\left(\frac{13}{2},-b x^2 \log (f)\right)}{2 \left(-b x^2 \log (f)\right)^{13/2}}$$

```
[Out] -1/2*f^a*x^13*(524288/5621533568633696205238621875*GAMMA(51/2,-b*x^2*ln(f))
-524288/5621533568633696205238621875*(-b*x^2*ln(f))^(49/2)*exp(b*x^2*ln(f))
-262144/114725174870075432759971875*(-b*x^2*ln(f))^(47/2)*exp(b*x^2*ln(f))-
131072/2440961167448413462978125*(-b*x^2*ln(f))^(45/2)*exp(b*x^2*ln(f))-655
36/54243581498853632510625*(-b*x^2*ln(f))^(43/2)*exp(b*x^2*ln(f))-32768/126
1478639508224011875*(-b*x^2*ln(f))^(41/2)*exp(b*x^2*ln(f))-16384/3076777169
5322536875*(-b*x^2*ln(f))^(39/2)*exp(b*x^2*ln(f))-8192/788917222956988125*(
-b*x^2*ln(f))^(37/2)*exp(b*x^2*ln(f))-4096/21322087106945625*(-b*x^2*ln(f))
^(35/2)*exp(b*x^2*ln(f))-2048/609202488769875*(-b*x^2*ln(f))^(33/2)*exp(b*x
^2*ln(f))-1024/18460681477875*(-b*x^2*ln(f))^(31/2)*exp(b*x^2*ln(f))-512/59
5505854125*(-b*x^2*ln(f))^(29/2)*exp(b*x^2*ln(f))-256/20534684625*(-b*x^2*l
n(f))^(27/2)*exp(b*x^2*ln(f))-128/760543875*(-b*x^2*ln(f))^(25/2)*exp(b*x^2
*ln(f))-64/30421755*(-b*x^2*ln(f))^(23/2)*exp(b*x^2*ln(f))-32/1322685*(-b*x
^2*ln(f))^(21/2)*exp(b*x^2*ln(f))-16/62985*(-b*x^2*ln(f))^(19/2)*exp(b*x^2*
ln(f))-8/3315*(-b*x^2*ln(f))^(17/2)*exp(b*x^2*ln(f))-4/195*(-b*x^2*ln(f))^(
15/2)*exp(b*x^2*ln(f))-2/13*(-b*x^2*ln(f))^(13/2)*exp(b*x^2*ln(f)))/(-b*x^2
*ln(f))^(13/2)
```

Rubi [A]
time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$-\frac{x^{13} f^a \text{Gamma}\left(\frac{13}{2},-b x^2 \log (f)\right)}{2 \left(-b x^2 \log (f)\right)^{13/2}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x^12,x]
```

```
[Out] -1/2*(f^a*x^13*Gamma[13/2, -(b*x^2*Log[f])])/(-(b*x^2*Log[f]))^(13/2)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^2}x^{12}\,dx = -\frac{f^a x^{13}\Gamma\left(\frac{13}{2}, -bx^2\log(f)\right)}{2\left(-bx^2\log(f)\right)^{13/2}}$$

Mathematica [A]
time = 0.04, size = 34, normalized size = 1.00

$$-\frac{f^a x^{13}\Gamma\left(\frac{13}{2}, -bx^2\log(f)\right)}{2\left(-bx^2\log(f)\right)^{13/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x^12,x]
[Out] -1/2*(f^a*x^13*Gamma[13/2, -(b*x^2*Log[f])])/(-(b*x^2*Log[f]))^(13/2)
```

Maple [A]
time = 0.10, size = 123, normalized size = 3.62

method	result
meijerg	$\frac{f^a\left(-\frac{x(-b)^{\frac{13}{2}}\sqrt{\ln(f)}\left(-416b^5x^{10}\ln(f)^5+2288b^4x^8\ln(f)^4-10296b^3x^6\ln(f)^3+36036b^2x^4\ln(f)^2-90090bx^2\ln(f)+135135\right)e^{bx^2\ln(f)}}{416b^6}+\cdots\right.}{2b^6\ln(f)^{\frac{13}{2}}\sqrt{-b}}$
risch	$\frac{f^a f^{bx^2}x^{11}}{2\ln(f)b}-\frac{11f^a x^9 f^{bx^2}}{4\ln(f)^2b^2}+\frac{99f^a x^7 f^{bx^2}}{8\ln(f)^3b^3}-\frac{693f^a x^5 f^{bx^2}}{16\ln(f)^4b^4}+\frac{3465f^a x^3 f^{bx^2}}{32\ln(f)^5b^5}-\frac{10395f^a x f^{bx^2}}{64\ln(f)^6b^6}+\frac{10395f^a\sqrt{\pi}\,\mathrm{erf}\left(\sqrt{\cdots}\right.}{128\ln(f)^6b^6\sqrt{-\cdots}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x^12,x,method=_RETURNVERBOSE)
[Out] 1/2*f^a/b^6/ln(f)^(13/2)/(-b)^(1/2)*(-1/416*x*(-b)^(13/2)*ln(f)^(1/2)*(-416
*b^5*x^10*ln(f)^5+2288*b^4*x^8*ln(f)^4-10296*b^3*x^6*ln(f)^3+36036*b^2*x^4*
ln(f)^2-90090*b*x^2*ln(f)+135135)/b^6*exp(b*x^2*ln(f))+10395/64*(-b)^(13/2)
/b^(13/2)*Pi^(1/2)*erfi(x*b^(1/2)*ln(f)^(1/2)))
```

Maxima [A]
time = 0.02, size = 127, normalized size = 3.74

$$\frac{\left(32\,b^5f^ax^{11}\log(f)^5-176\,b^4f^ax^9\log(f)^4+792\,b^3f^ax^7\log(f)^3-2772\,b^2f^ax^5\log(f)^2+6930\,bf^ax^3\log(f)-10395\,f^ax\right)f^{bx^2}}{64\,b^6\log(f)^6}+\frac{10395\,\sqrt{\pi}\,f^a\,\mathrm{erf}\left(\sqrt{-b\log(f)}\,x\right)}{128\,\sqrt{-b\log(f)}\,b^6\log(f)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^12,x, algorithm="maxima")
```

```
[Out] 1/64*(32*b^5*f^a*x^11*log(f)^5 - 176*b^4*f^a*x^9*log(f)^4 + 792*b^3*f^a*x^7
*log(f)^3 - 2772*b^2*f^a*x^5*log(f)^2 + 6930*b*f^a*x^3*log(f) - 10395*f^a*x
)*f^(b*x^2)/(b^6*log(f)^6) + 10395/128*sqrt(pi)*f^a*erf(sqrt(-b*log(f))*x)/
(sqrt(-b*log(f))*b^6*log(f)^6)
```

Fricas [A]
time = 0.08, size = 113, normalized size = 3.32

$$-\frac{10395 \sqrt{\pi} \sqrt{-b \log\left(f\right)} f^{a} \operatorname{erf}\left(\sqrt{-b \log\left(f\right)} x\right) - 2 \, {\left(32 \, b^{6} x^{11} \log\left(f\right)^{6} - 176 \, b^{5} x^{9} \log\left(f\right)^{5} + 792 \, b^{4} x^{7} \log\left(f\right)^{4} - 2772 \, b^{3} x^{5} \log\left(f\right)^{3} + 6930 \, b^{2} x^{3} \log\left(f\right)^{2} - 10395 \, b x \log\left(f\right)\right)} f^{b x^{2} + a}}{128 \, b^{7} \log\left(f\right)^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^12,x, algorithm="fricas")
```

```
[Out] -1/128*(10395*sqrt(pi)*sqrt(-b*log(f))*f^a*erf(sqrt(-b*log(f))*x) - 2*(32*b
^6*x^11*log(f)^6 - 176*b^5*x^9*log(f)^5 + 792*b^4*x^7*log(f)^4 - 2772*b^3*x
^5*log(f)^3 + 6930*b^2*x^3*log(f)^2 - 10395*b*x*log(f))*f^(b*x^2 + a))/(b^7
*log(f)^7)
```

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

$$\int f^{a + b x^{2}} x^{12}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x**12,x)
```

```
[Out] Integral(f**(a + b*x**2)*x**12, x)
```

Giac [A]
time = 0.83, size = 116, normalized size = 3.41

$$-\frac{10395 \sqrt{\pi} f^{a} \operatorname{erf}\left(-\sqrt{-b \log\left(f\right)} x\right)}{128 \, \sqrt{-b \log\left(f\right)} b^{6} \log\left(f\right)^{6}} + \frac{{\left(32 \, b^{5} x^{11} \log\left(f\right)^{5} - 176 \, b^{4} x^{9} \log\left(f\right)^{4} + 792 \, b^{3} x^{7} \log\left(f\right)^{3} - 2772 \, b^{2} x^{5} \log\left(f\right)^{2} + 6930 \, b x^{3} \log\left(f\right) - 10395 \, x\right)} e^{\left(b x^{2} \log\left(f\right) + a \log\left(f\right)\right)}}{64 \, b^{6} \log\left(f\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^12,x, algorithm="giac")
```

```
[Out] -10395/128*sqrt(pi)*f^a*erf(-sqrt(-b*log(f))*x)/(sqrt(-b*log(f))*b^6*log(f)
^6) + 1/64*(32*b^5*x^11*log(f)^5 - 176*b^4*x^9*log(f)^4 + 792*b^3*x^7*log(f
)^3 - 2772*b^2*x^5*log(f)^2 + 6930*b*x^3*log(f) - 10395*x)*e^(b*x^2*log(f)
+ a*log(f))/(b^6*log(f)^6)
```

Mupad [B]
time = 3.63, size = 154, normalized size = 4.53

$$\frac{\frac{f^a\,\left(\frac{10395\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln\left(f\right)}{\sqrt{b\,\ln\left(f\right)}}\right)}{128}-\frac{10395\,f^{b\,x^2}\,x\,\sqrt{b\,\ln\left(f\right)}}{64}\right)}{\sqrt{b\,\ln\left(f\right)}}-\frac{693\,b^2\,f^{b\,x^2+a}\,x^5\,{\ln\left(f\right)}^2}{16}+\frac{99\,b^3\,f^{b\,x^2+a}\,x^7\,{\ln\left(f\right)}^3}{8}-\frac{11\,b^4\,f^{b\,x^2+a}\,x^9\,{\ln\left(f\right)}^4}{4}+\frac{b^5\,f^{b\,x^2+a}\,x^{11}\,{\ln\left(f\right)}^5}{2}+\frac{3465\,b\,f^{b\,x^2+a}\,x^3\,\ln\left(f\right)}{32}}{b^6\,{\ln\left(f\right)}^6}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(f^(a + b*x^2)*x^12,x)

[Out] ((f^a*((10395*pi^(1/2)*erfi((b*x*log(f))/(b*log(f))^(1/2)))/128 - (10395*f^(b*x^2)*x*(b*log(f))^(1/2))/64))/(b*log(f))^(1/2) - (693*b^2*f^(a + b*x^2)*x^5*log(f)^2)/16 + (99*b^3*f^(a + b*x^2)*x^7*log(f)^3)/8 - (11*b^4*f^(a + b*x^2)*x^9*log(f)^4)/4 + (b^5*f^(a + b*x^2)*x^11*log(f)^5)/2 + (3465*b*f^(a + b*x^2)*x^3*log(f))/32)/(b^6*log(f)^6)

3.83 $\int f^{a+bx^2} x^{10} \, dx$

Optimal. Leaf size=34

$$-\frac{f^a x^{11} \Gamma\left(\frac{11}{2}, -b x^2 \log(f)\right)}{2 \left(-b x^2 \log(f)\right)^{11/2}}$$

```
[Out] -1/2*f^a*x^11*(1048576/618368692549706582576248406 25*GAMMA(51/2,-b*x^2*ln(f
))-1048576/61836869254970658257624840625*(-b*x^2*ln(f))^(49/2)*exp(b*x^2*ln
(f))-524288/1261976923570829760359690625*(-b*x^2*ln(f))^(47/2)*exp(b*x^2*ln
(f))-262144/26850572841932548092759375*(-b*x^2*ln(f))^(45/2)*exp(b*x^2*ln(f
))-131072/596679396487389957616875*(-b*x^2*ln(f))^(43/2)*exp(b*x^2*ln(f))-6
5536/13876265034590464130625*(-b*x^2*ln(f))^(41/2)*exp(b*x^2*ln(f))-32768/3
38445488648547905625*(-b*x^2*ln(f))^(39/2)*exp(b*x^2*ln(f))-16384/867808945
2526869375*(-b*x^2*ln(f))^(37/2)*exp(b*x^2*ln(f))-8192/234542958176401875*(
-b*x^2*ln(f))^(35/2)*exp(b*x^2*ln(f))-4096/6701227376468625*(-b*x^2*ln(f))^
(33/2)*exp(b*x^2*ln(f))-2048/203067496256625*(-b*x^2*ln(f))^(31/2)*exp(b*x^
2*ln(f))-1024/6550564395375*(-b*x^2*ln(f))^(29/2)*exp(b*x^2*ln(f))-512/2258
81530875*(-b*x^2*ln(f))^(27/2)*exp(b*x^2*ln(f))-256/8365982625*(-b*x^2*ln(f
))^(25/2)*exp(b*x^2*ln(f))-128/334639305*(-b*x^2*ln(f))^(23/2)*exp(b*x^2*ln
(f))-64/14549535*(-b*x^2*ln(f))^(21/2)*exp(b*x^2*ln(f))-32/692835*(-b*x^2*l
n(f))^(19/2)*exp(b*x^2*ln(f))-16/36465*(-b*x^2*ln(f))^(17/2)*exp(b*x^2*ln(f
))-8/2145*(-b*x^2*ln(f))^(15/2)*exp(b*x^2*ln(f))-4/143*(-b*x^2*ln(f))^(13/2
)*exp(b*x^2*ln(f))-2/11*(-b*x^2*ln(f))^(11/2)*exp(b*x^2*ln(f)))/(-b*x^2*ln(
f))^(11/2)
```

Rubi [A]
time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$-\frac{x^{11} f^a \text{Gamma}\left(\frac{11}{2}, -b x^2 \log(f)\right)}{2 \left(-b x^2 \log(f)\right)^{11/2}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x^10,x]
```

```
[Out] -1/2*(f^a*x^11*Gamma[11/2, -(b*x^2*Log[f])])/(-(b*x^2*Log[f]))^(11/2)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^2}x^{10}\,dx=-\frac{f^ax^{11}\Gamma\left(\frac{11}{2},-bx^2\log(f)\right)}{2\left(-bx^2\log(f)\right)^{11/2}}$$

Mathematica [A]
time = 0.04, size = 34, normalized size = 1.00

$$-\frac{f^ax^{11}\Gamma\left(\frac{11}{2},-bx^2\log(f)\right)}{2\left(-bx^2\log(f)\right)^{11/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x^10,x]
```

```
[Out] -1/2*(f^a*x^11*Gamma[11/2, -(b*x^2*Log[f])])/(-(b*x^2*Log[f]))^(11/2)
```

Maple [A]
time = 0.04, size = 111, normalized size = 3.26

method	result
meijerg	$-\frac{f^a\left(\frac{x(-b)^{\frac{11}{2}}\sqrt{\ln(f)}\left(176b^4x^8\ln(f)^4-792b^3x^6\ln(f)^3+2772b^2x^4\ln(f)^2-6930b\,x^2\ln(f)+10395\right)e^{b\,x^2\ln(f)}}{176b^5}-\frac{945(-b)^{\frac{11}{2}}\sqrt{\pi}\,\operatorname{erfi}\left(x\sqrt{\cdots}\right)}{32b^{\frac{11}{2}}}\cdots\right)}{2b^5\ln(f)^{\frac{11}{2}}\sqrt{-b}}$
risch	$\frac{f^ax^9f^{b\,x^2}}{2\ln(f)b}-\frac{9f^ax^7f^{b\,x^2}}{4\ln(f)^2b^2}+\frac{63f^ax^5f^{b\,x^2}}{8\ln(f)^3b^3}-\frac{315f^ax^3f^{b\,x^2}}{16\ln(f)^4b^4}+\frac{945f^ax\,f^{b\,x^2}}{32\ln(f)^5b^5}-\frac{945f^a\sqrt{\pi}\,\operatorname{erf}\left(\sqrt{-b\ln(f)}\,x\right)}{64\ln(f)^5b^5\sqrt{-b\ln(f)}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x^10,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*f^a/b^5/ln(f)^(11/2)/(-b)^(1/2)*(1/176*x*(-b)^(11/2)*ln(f)^(1/2)*(176*
b^4*x^8*ln(f)^4-792*b^3*x^6*ln(f)^3+2772*b^2*x^4*ln(f)^2-6930*b*x^2*ln(f)+1
0395)/b^5*exp(b*x^2*ln(f))-945/32*(-b)^(11/2)/b^(11/2)*Pi^(1/2)*erfi(x*b^(1
/2)*ln(f)^(1/2)))
```

Maxima [A]
time = 0.02, size = 112, normalized size = 3.29

$$\frac{\left(16\,b^4f^ax^9\log(f)^4-72\,b^3f^ax^7\log(f)^3+252\,b^2f^ax^5\log(f)^2-630\,bf^ax^3\log(f)+945\,f^ax\right)f^{bx^2}}{32\,b^5\log(f)^5}-\frac{945\,\sqrt{\pi}\,f^a\operatorname{erf}\left(\sqrt{-b\log(f)}\,x\right)}{64\,\sqrt{-b\log(f)}\,b^5\log(f)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^10,x, algorithm="maxima")
```

[Out] 1/32*(16*b^4*f^a*x^9*log(f)^4 - 72*b^3*f^a*x^7*log(f)^3 + 252*b^2*f^a*x^5*log(f)^2 - 630*b*f^a*x^3*log(f) + 945*f^a*x)*f^(b*x^2)/(b^5*log(f)^5) - 945/64*sqrt(pi)*f^a*erf(sqrt(-b*log(f))*x)/(sqrt(-b*log(f))*b^5*log(f)^5)

Fricas [A]
time = 0.09, size = 101, normalized size = 2.97

$$\frac{945\sqrt{\pi}\sqrt{-b\log(f)}\,f^a\operatorname{erf}\left(\sqrt{-b\log(f)}\,x\right)+2\left(16\,b^5x^9\log(f)^5-72\,b^4x^7\log(f)^4+252\,b^3x^5\log(f)^3-630\,b^2x^3\log(f)^2+945\,bx\log(f)\right)f^{bx^2+a}}{64\,b^6\log(f)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(b*x^2+a)*x^10,x, algorithm="fricas")

[Out] 1/64*(945*sqrt(pi)*sqrt(-b*log(f))*f^a*erf(sqrt(-b*log(f))*x) + 2*(16*b^5*x^9*log(f)^5 - 72*b^4*x^7*log(f)^4 + 252*b^3*x^5*log(f)^3 - 630*b^2*x^3*log(f)^2 + 945*b*x*log(f))*f^(b*x^2 + a))/(b^6*log(f)^6)

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

$$\int f^{a+bx^2}x^{10}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f**(b*x**2+a)*x**10,x)

[Out] Integral(f**(a + b*x**2)*x**10, x)

Giac [A]
time = 2.31, size = 104, normalized size = 3.06

$$\frac{945\sqrt{\pi}\,f^a\operatorname{erf}\left(-\sqrt{-b\log(f)}\,x\right)}{64\sqrt{-b\log(f)}\,b^5\log(f)^5}+\frac{\left(16\,b^4x^9\log(f)^4-72\,b^3x^7\log(f)^3+252\,b^2x^5\log(f)^2-630\,bx^3\log(f)+945\,x\right)e^{\left(bx^2\log(f)+a\log(f)\right)}}{32\,b^5\log(f)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(b*x^2+a)*x^10,x, algorithm="giac")

[Out] 945/64*sqrt(pi)*f^a*erf(-sqrt(-b*log(f))*x)/(sqrt(-b*log(f))*b^5*log(f)^5) + 1/32*(16*b^4*x^9*log(f)^4 - 72*b^3*x^7*log(f)^3 + 252*b^2*x^5*log(f)^2 - 630*b*x^3*log(f) + 945*x)*e^(b*x^2*log(f) + a*log(f))/(b^5*log(f)^5)

Mupad [B]
time = 3.57, size = 139, normalized size = 4.09

$$-\frac{\frac{f^a\left(945\sqrt{\pi}\operatorname{erfi}\left(\frac{b\,x\,\ln(f)}{\sqrt{b\,\ln(f)}}\right)-1890\,f^{b\,x^2}\,x\,\sqrt{b\,\ln(f)}\right)}{64\sqrt{b\,\ln(f)}}-\frac{63\,b^2\,f^a\,f^{b\,x^2}\,x^5\ln(f)^2}{8}+\frac{9\,b^3\,f^a\,f^{b\,x^2}\,x^7\ln(f)^3}{4}-\frac{b^4\,f^a\,f^{b\,x^2}\,x^9\ln(f)^4}{2}+\frac{315\,b\,f^a\,f^{b\,x^2}\,x^3\ln(f)}{16}}{b^5\ln(f)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x^10,x)
```

```
[Out] -((f^a*(945*pi^(1/2)*erfi((b*x*log(f))/(b*log(f))^(1/2)) - 1890*f^(b*x^2)*x
*(b*log(f))^(1/2)))/(64*(b*log(f))^(1/2)) - (63*b^2*f^a*f^(b*x^2)*x^5*log(f
)^2)/8 + (9*b^3*f^a*f^(b*x^2)*x^7*log(f)^3)/4 - (b^4*f^a*f^(b*x^2)*x^9*log(
f)^4)/2 + (315*b*f^a*f^(b*x^2)*x^3*log(f))/16)/(b^5*log(f)^5)
```

3.84 $\int f^{a+bx^2}x^8\,dx$

Optimal. Leaf size=128

$$\frac{105f^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)}{32b^{9/2}\log^{\frac{9}{2}}(f)}-\frac{105f^{a+bx^2}x}{16b^4\log^4(f)}+\frac{35f^{a+bx^2}x^3}{8b^3\log^3(f)}-\frac{7f^{a+bx^2}x^5}{4b^2\log^2(f)}+\frac{f^{a+bx^2}x^7}{2b\log(f)}$$

```
[Out] -105/16*f^(b*x^2+a)*x/b^4/ln(f)^4+35/8*f^(b*x^2+a)*x^3/b^3/ln(f)^3-7/4*f^(b
*x^2+a)*x^5/b^2/ln(f)^2+1/2*f^(b*x^2+a)*x^7/b/ln(f)+105/32*f^a*erfi(x*b^(1/
2)*ln(f)^(1/2))*Pi^(1/2)/b^(9/2)/ln(f)^(9/2)
```

Rubi [A]
time = 0.10, antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2243, 2235}

$$\frac{105\sqrt{\pi}\,f^a\text{Erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)}{32b^{9/2}\log^{\frac{9}{2}}(f)}-\frac{105xf^{a+bx^2}}{16b^4\log^4(f)}+\frac{35x^3f^{a+bx^2}}{8b^3\log^3(f)}-\frac{7x^5f^{a+bx^2}}{4b^2\log^2(f)}+\frac{x^7f^{a+bx^2}}{2b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x^8,x]
```

```
[Out] (105*f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]])/(32*b^(9/2)*Log[f]^(9/2)) -
 (105*f^(a + b*x^2)*x)/(16*b^4*Log[f]^4) + (35*f^(a + b*x^2)*x^3)/(8*b^3*Lo
g[f]^3) - (7*f^(a + b*x^2)*x^5)/(4*b^2*Log[f]^2) + (f^(a + b*x^2)*x^7)/(2*b
*Log[f])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$
\begin{aligned}
\int f^{a+bx^2}x^8\,dx &= \frac{f^{a+bx^2}x^7}{2b\log(f)}-\frac{7\int f^{a+bx^2}x^6\,dx}{2b\log(f)}\\
&= -\frac{7f^{a+bx^2}x^5}{4b^2\log^2(f)}+\frac{f^{a+bx^2}x^7}{2b\log(f)}+\frac{35\int f^{a+bx^2}x^4\,dx}{4b^2\log^2(f)}\\
&= \frac{35f^{a+bx^2}x^3}{8b^3\log^3(f)}-\frac{7f^{a+bx^2}x^5}{4b^2\log^2(f)}+\frac{f^{a+bx^2}x^7}{2b\log(f)}-\frac{105\int f^{a+bx^2}x^2\,dx}{8b^3\log^3(f)}\\
&= -\frac{105f^{a+bx^2}x}{16b^4\log^4(f)}+\frac{35f^{a+bx^2}x^3}{8b^3\log^3(f)}-\frac{7f^{a+bx^2}x^5}{4b^2\log^2(f)}+\frac{f^{a+bx^2}x^7}{2b\log(f)}+\frac{105\int f^{a+bx^2}\,dx}{16b^4\log^4(f)}\\
&= \frac{105f^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)}{32b^{9/2}\log^{\frac{9}{2}}(f)}-\frac{105f^{a+bx^2}x}{16b^4\log^4(f)}+\frac{35f^{a+bx^2}x^3}{8b^3\log^3(f)}-\frac{7f^{a+bx^2}x^5}{4b^2\log^2(f)}+\frac{f^{a+bx^2}x^7}{2b\log(f)}
\end{aligned}
$$

Mathematica [A]
time = 0.06, size = 95, normalized size = 0.74

$$
\frac{f^a\left(105\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)+2\sqrt{b}\,f^{bx^2}x\sqrt{\log(f)}\left(-105+70bx^2\log(f)-28b^2x^4\log^2(f)+8b^3x^6\log^3(f)\right)\right)}{32b^{9/2}\log^{\frac{9}{2}}(f)}
$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x^8,x]
```

```
[Out] (f^a*(105*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]] + 2*Sqrt[b]*f^(b*x^2)*x*Sqr
t[Log[f]]*(-105 + 70*b*x^2*Log[f] - 28*b^2*x^4*Log[f]^2 + 8*b^3*x^6*Log[f]^
3)))/(32*b^(9/2)*Log[f]^(9/2))
```

Maple [A]
time = 0.03, size = 99, normalized size = 0.77

method	result
meijerg	$\frac{f^a\left(-\frac{x(-b)^{\frac{9}{2}}\sqrt{\ln(f)}\left(-72b^3x^6\ln(f)^3+252b^2x^4\ln(f)^2-630b\,x^2\ln(f)+945\right)e^{b\,x^2\ln(f)}}{72b^4}+\frac{105(-b)^{\frac{9}{2}}\sqrt{\pi}\,\mathrm{erfi}\left(x\sqrt{b}\,\sqrt{\ln(f)}\right)}{16b^{\frac{9}{2}}}\right)}{2\ln(f)^{\frac{9}{2}}b^4\sqrt{-b}}$
risch	$\frac{f^a x^7 f^{b\,x^2}}{2\ln(f)b}-\frac{7f^a x^5 f^{b\,x^2}}{4\ln(f)^2b^2}+\frac{35f^a x^3 f^{b\,x^2}}{8\ln(f)^3b^3}-\frac{105f^a x\,f^{b\,x^2}}{16\ln(f)^4b^4}+\frac{105f^a\sqrt{\pi}\,\mathrm{erf}\left(\sqrt{-b\ln(f)}\,x\right)}{32\ln(f)^4b^4\sqrt{-b\ln(f)}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x^8,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*f^a/ln(f)^(9/2)/b^4/(-b)^(1/2)*(-1/72*x*(-b)^(9/2)*ln(f)^(1/2)*(-72*b^3
*x^6*ln(f)^3+252*b^2*x^4*ln(f)^2-630*b*x^2*ln(f)+945)/b^4*exp(b*x^2*ln(f))+
105/16*(-b)^(9/2)/b^(9/2)*Pi^(1/2)*erfi(x*b^(1/2)*ln(f)^(1/2)))
```

Maxima [A]
time = 0.29, size = 97, normalized size = 0.76

$$\frac{\left(8\,b^3f^ax^7\log\left(f\right)^3-28\,b^2f^ax^5\log\left(f\right)^2+70\,bf^ax^3\log\left(f\right)-105\,f^ax\right)f^{bx^2}}{16\,b^4\log\left(f\right)^4}+\frac{105\,\sqrt{\pi}\,f^a\,\mathrm{erf}\left(\sqrt{-b\log\left(f\right)}\,x\right)}{32\,\sqrt{-b\log\left(f\right)}\,b^4\log\left(f\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^8,x, algorithm="maxima")
```

```
[Out] 1/16*(8*b^3*f^a*x^7*log(f)^3 - 28*b^2*f^a*x^5*log(f)^2 + 70*b*f^a*x^3*log(f
) - 105*f^a*x)*f^(b*x^2)/(b^4*log(f)^4) + 105/32*sqrt(pi)*f^a*erf(sqrt(-b*l
og(f))*x)/(sqrt(-b*log(f))*b^4*log(f)^4)
```

Fricas [A]
time = 0.34, size = 89, normalized size = 0.70

$$-\frac{105\,\sqrt{\pi}\,\sqrt{-b\log\left(f\right)}\,f^a\,\mathrm{erf}\left(\sqrt{-b\log\left(f\right)}\,x\right)-2\,\left(8\,b^4x^7\log\left(f\right)^4-28\,b^3x^5\log\left(f\right)^3+70\,b^2x^3\log\left(f\right)^2-105\,bx\log\left(f\right)\right)f^{bx^2+a}}{32\,b^5\log\left(f\right)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^8,x, algorithm="fricas")
```

```
[Out] -1/32*(105*sqrt(pi)*sqrt(-b*log(f))*f^a*erf(sqrt(-b*log(f))*x) - 2*(8*b^4*x
^7*log(f)^4 - 28*b^3*x^5*log(f)^3 + 70*b^2*x^3*log(f)^2 - 105*b*x*log(f))*f
^(b*x^2 + a))/(b^5*log(f)^5)
```

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

$$\int f^{a+bx^2}x^8\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x**8,x)
```

```
[Out] Integral(f**(a + b*x**2)*x**8, x)
```

Giac [A]
time = 3.26, size = 92, normalized size = 0.72

$$-\frac{105\,\sqrt{\pi}\,f^a\,\mathrm{erf}\left(-\sqrt{-b\log\left(f\right)}\,x\right)}{32\,\sqrt{-b\log\left(f\right)}\,b^4\log\left(f\right)^4}+\frac{\left(8\,b^3x^7\log\left(f\right)^3-28\,b^2x^5\log\left(f\right)^2+70\,bx^3\log\left(f\right)-105\,x\right)e^{\left(bx^2\log\left(f\right)+a\log\left(f\right)\right)}}{16\,b^4\log\left(f\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^8,x, algorithm="giac")
```

```
[Out] -105/32*sqrt(pi)*f^a*erf(-sqrt(-b*log(f))*x)/(sqrt(-b*log(f))*b^4*log(f)^4)
 + 1/16*(8*b^3*x^7*log(f)^3 - 28*b^2*x^5*log(f)^2 + 70*b*x^3*log(f) - 105*x
)*e^(b*x^2*log(f) + a*log(f))/(b^4*log(f)^4)
```

Mupad [B]
time = 3.55, size = 116, normalized size = 0.91

$$\frac{\frac{f^a\left(105\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln(f)}{\sqrt{b\,\ln\left(f\right)}}\right)-210\,f^{b\,x^2}\,x\,\sqrt{b\,\ln\left(f\right)}\right)}{32\,\sqrt{b\,\ln\left(f\right)}}-\frac{7\,b^2\,f^a\,f^{b\,x^2}\,x^5\,\ln(f)^2}{4}+\frac{b^3\,f^a\,f^{b\,x^2}\,x^7\,\ln(f)^3}{2}+\frac{35\,b\,f^a\,f^{b\,x^2}\,x^3\,\ln(f)}{8}}{b^4\,\ln\left(f\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x^8,x)
```

```
[Out] ((f^a*(105*pi^(1/2)*erfi((b*x*log(f))/(b*log(f))^(1/2)) - 210*f^(b*x^2)*x*(
b*log(f))^(1/2)))/(32*(b*log(f))^(1/2)) - (7*b^2*f^a*f^(b*x^2)*x^5*log(f)^2
)/4 + (b^3*f^a*f^(b*x^2)*x^7*log(f)^3)/2 + (35*b*f^a*f^(b*x^2)*x^3*log(f))/
8)/(b^4*log(f)^4)
```

3.85 $\int f^{a+bx^2} x^6 \, dx$

Optimal. Leaf size=105

$$-\frac{15 f^a \sqrt{\pi}\, \mathrm{erfi}\left(\sqrt{b}\, x \sqrt{\log(f)}\right)}{16 b^{7/2} \log^{\frac{7}{2}}(f)}+\frac{15 f^{a+bx^2} x}{8 b^3 \log^3(f)}-\frac{5 f^{a+bx^2} x^3}{4 b^2 \log^2(f)}+\frac{f^{a+bx^2} x^5}{2 b \log(f)}$$

```
[Out] 15/8*f^(b*x^2+a)*x/b^3/ln(f)^3-5/4*f^(b*x^2+a)*x^3/b^2/ln(f)^2+1/2*f^(b*x^2
+a)*x^5/b/ln(f)-15/16*f^a*erfi(x*b^(1/2)*ln(f)^(1/2))*Pi^(1/2)/b^(7/2)/ln(f
)^(7/2)
```

Rubi [A]
time = 0.08, antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2243, 2235}

$$-\frac{15 \sqrt{\pi} f^a \mathrm{Erfi}\left(\sqrt{b}\, x \sqrt{\log(f)}\right)}{16 b^{7/2} \log^{\frac{7}{2}}(f)}+\frac{15 x f^{a+bx^2}}{8 b^3 \log^3(f)}-\frac{5 x^3 f^{a+bx^2}}{4 b^2 \log^2(f)}+\frac{x^5 f^{a+bx^2}}{2 b \log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x^6,x]
```

```
[Out] (-15*f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]])/(16*b^(7/2)*Log[f]^(7/2)) +
 (15*f^(a + b*x^2)*x)/(8*b^3*Log[f]^3) - (5*f^(a + b*x^2)*x^3)/(4*b^2*Log[f
]^2) + (f^(a + b*x^2)*x^5)/(2*b*Log[f])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\begin{aligned}\int f^{a+bx^2}x^6\,dx &= \frac{f^{a+bx^2}x^5}{2b\log(f)} - \frac{5\int f^{a+bx^2}x^4\,dx}{2b\log(f)} \\ &= -\frac{5f^{a+bx^2}x^3}{4b^2\log^2(f)} + \frac{f^{a+bx^2}x^5}{2b\log(f)} + \frac{15\int f^{a+bx^2}x^2\,dx}{4b^2\log^2(f)} \\ &= \frac{15f^{a+bx^2}x}{8b^3\log^3(f)} - \frac{5f^{a+bx^2}x^3}{4b^2\log^2(f)} + \frac{f^{a+bx^2}x^5}{2b\log(f)} - \frac{15\int f^{a+bx^2}\,dx}{8b^3\log^3(f)} \\ &= -\frac{15f^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)}{16b^{7/2}\log^{\frac{7}{2}}(f)} + \frac{15f^{a+bx^2}x}{8b^3\log^3(f)} - \frac{5f^{a+bx^2}x^3}{4b^2\log^2(f)} + \frac{f^{a+bx^2}x^5}{2b\log(f)}\end{aligned}$$

Mathematica [A]
time = 0.06, size = 83, normalized size = 0.79

$$\frac{f^a\left(-15\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right) + 2\sqrt{b}\,f^{bx^2}x\sqrt{\log(f)}\,\left(15 - 10bx^2\log(f) + 4b^2x^4\log^2(f)\right)\right)}{16b^{7/2}\log^{\frac{7}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x^6,x]
```

```
[Out] (f^a*(-15*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]] + 2*Sqrt[b]*f^(b*x^2)*x*Sqr
t[Log[f]]*(15 - 10*b*x^2*Log[f] + 4*b^2*x^4*Log[f]^2)))/(16*b^(7/2)*Log[f]^
(7/2))
```

Maple [A]
time = 0.03, size = 87, normalized size = 0.83

method	result	size
meijerg	$-\frac{f^a\left(\frac{x(-b)^{\frac{7}{2}}\sqrt{\ln(f)}\,\left(28b^2x^4\ln(f)^2-70b\,x^2\ln(f)+105\right)e^{b\,x^2\ln(f)}}{28b^3}-\frac{15(-b)^{\frac{7}{2}}\sqrt{\pi}\,\mathrm{erfi}\left(x\sqrt{b}\,\sqrt{\ln(f)}\right)}{8b^{\frac{7}{2}}}\right)}{2\ln(f)^{\frac{7}{2}}b^3\sqrt{-b}}$	87
risch	$\frac{f^a x^5 f^{b\,x^2}}{2\ln(f)b}-\frac{5f^a x^3 f^{b\,x^2}}{4\ln(f)^2b^2}+\frac{15f^a x\,f^{b\,x^2}}{8\ln(f)^3b^3}-\frac{15f^a\sqrt{\pi}\,\mathrm{erf}\left(\sqrt{-b\ln(f)}\,x\right)}{16\ln(f)^3b^3\sqrt{-b\ln(f)}}$	98

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x^6,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*f^a/ln(f)^(7/2)/b^3/(-b)^(1/2)*(1/28*x*(-b)^(7/2)*ln(f)^(1/2)*(28*b^2*
x^4*ln(f)^2-70*b*x^2*ln(f)+105)/b^3*exp(b*x^2*ln(f))-15/8*(-b)^(7/2)/b^(7/2
)*Pi^(1/2)*erfi(x*b^(1/2)*ln(f)^(1/2)))
```

Maxima [A]
time = 0.28, size = 82, normalized size = 0.78

$$\frac{\left(4\,b^2f^ax^5\log\left(f\right)^2-10\,bf^ax^3\log\left(f\right)+15\,f^ax\right)f^{bx^2}}{8\,b^3\log\left(f\right)^3}-\frac{15\,\sqrt{\pi}\,f^a\operatorname{erf}\left(\sqrt{-b\log\left(f\right)}\,x\right)}{16\,\sqrt{-b\log\left(f\right)}\,b^3\log\left(f\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^6,x, algorithm="maxima")
```

```
[Out] 1/8*(4*b^2*f^a*x^5*log(f)^2 - 10*b*f^a*x^3*log(f) + 15*f^a*x)*f^(b*x^2)/(b^
3*log(f)^3) - 15/16*sqrt(pi)*f^a*erf(sqrt(-b*log(f))*x)/(sqrt(-b*log(f))*b^
3*log(f)^3)
```

Fricas [A]
time = 0.39, size = 77, normalized size = 0.73

$$\frac{15\,\sqrt{\pi}\,\sqrt{-b\log\left(f\right)}\,f^a\operatorname{erf}\left(\sqrt{-b\log\left(f\right)}\,x\right)+2\,\left(4\,b^3x^5\log\left(f\right)^3-10\,b^2x^3\log\left(f\right)^2+15\,bx\log\left(f\right)\right)f^{bx^2+a}}{16\,b^4\log\left(f\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^6,x, algorithm="fricas")
```

```
[Out] 1/16*(15*sqrt(pi)*sqrt(-b*log(f))*f^a*erf(sqrt(-b*log(f))*x) + 2*(4*b^3*x^5
*log(f)^3 - 10*b^2*x^3*log(f)^2 + 15*b*x*log(f))*f^(b*x^2 + a))/(b^4*log(f)
^4)
```

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

$$\int f^{a+bx^2}x^6\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x**6,x)
```

```
[Out] Integral(f**(a + b*x**2)*x**6, x)
```

Giac [A]
time = 2.56, size = 80, normalized size = 0.76

$$\frac{15\,\sqrt{\pi}\,f^a\operatorname{erf}\left(-\sqrt{-b\log\left(f\right)}\,x\right)}{16\,\sqrt{-b\log\left(f\right)}\,b^3\log\left(f\right)^3}+\frac{\left(4\,b^2x^5\log\left(f\right)^2-10\,bx^3\log\left(f\right)+15\,x\right)e^{\left(bx^2\log\left(f\right)+a\log\left(f\right)\right)}}{8\,b^3\log\left(f\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^6,x, algorithm="giac")
```

```
[Out] 15/16*sqrt(pi)*f^a*erf(-sqrt(-b*log(f))*x)/(sqrt(-b*log(f))*b^3*log(f)^3) +
 1/8*(4*b^2*x^5*log(f)^2 - 10*b*x^3*log(f) + 15*x)*e^(b*x^2*log(f) + a*log(
f))/(b^3*log(f)^3)
```

Mupad [B]
time = 3.52, size = 98, normalized size = 0.93

$$\frac{15\,f^a\,f^{b\,x^2}\,x}{8\,b^3\ln\left(f\right)^3}+\frac{f^a\,f^{b\,x^2}\,x^5}{2\,b\,\ln\left(f\right)}-\frac{5\,f^a\,f^{b\,x^2}\,x^3}{4\,b^2\ln\left(f\right)^2}-\frac{15\,f^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln(f)}{\sqrt{b\,\ln\left(f\right)}}\right)}{16\,b^3\ln\left(f\right)^3\,\sqrt{b\,\ln\left(f\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x^6,x)
```

```
[Out] (15*f^a*f^(b*x^2)*x)/(8*b^3*log(f)^3) + (f^a*f^(b*x^2)*x^5)/(2*b*log(f)) -
(5*f^a*f^(b*x^2)*x^3)/(4*b^2*log(f)^2) - (15*f^a*pi^(1/2)*erfi((b*x*log(f))
/(b*log(f))^(1/2)))/(16*b^3*log(f)^3*(b*log(f))^(1/2))
```

3.86 $\int f^{a+bx^2} x^4 \, dx$

Optimal. Leaf size=82

$$\frac{3f^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)}{8b^{5/2}\log^{\frac{5}{2}}(f)}-\frac{3f^{a+bx^2}x}{4b^2\log^2(f)}+\frac{f^{a+bx^2}x^3}{2b\log(f)}$$

```
[Out] -3/4*f^(b*x^2+a)*x/b^2/ln(f)^2+1/2*f^(b*x^2+a)*x^3/b/ln(f)+3/8*f^a*erfi(x*b
^(1/2)*ln(f)^(1/2))*Pi^(1/2)/b^(5/2)/ln(f)^(5/2)
```

Rubi [A]
time = 0.04, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2243, 2235}

$$\frac{3\sqrt{\pi}\,f^a\mathrm{Erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)}{8b^{5/2}\log^{\frac{5}{2}}(f)}-\frac{3xf^{a+bx^2}}{4b^2\log^2(f)}+\frac{x^3f^{a+bx^2}}{2b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x^4,x]
```

```
[Out] (3*f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]])/(8*b^(5/2)*Log[f]^(5/2)) - (3
*f^(a + b*x^2)*x)/(4*b^2*Log[f]^2) + (f^(a + b*x^2)*x^3)/(2*b*Log[f])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int f^{a+bx^2}x^4\,dx = \frac{f^{a+bx^2}x^3}{2b\log(f)} - \frac{3\int f^{a+bx^2}x^2\,dx}{2b\log(f)}$$
$$= -\frac{3f^{a+bx^2}x}{4b^2\log^2(f)} + \frac{f^{a+bx^2}x^3}{2b\log(f)} + \frac{3\int f^{a+bx^2}\,dx}{4b^2\log^2(f)}$$
$$= \frac{3f^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)}{8b^{5/2}\log^{\frac{5}{2}}(f)} - \frac{3f^{a+bx^2}x}{4b^2\log^2(f)} + \frac{f^{a+bx^2}x^3}{2b\log(f)}$$

Mathematica [A]
time = 0.05, size = 71, normalized size = 0.87

$$\frac{f^a\left(3\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right) + 2\sqrt{b}\,f^{bx^2}x\sqrt{\log(f)}\,(-3+2bx^2\log(f))\right)}{8b^{5/2}\log^{\frac{5}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x^4,x]
```

```
[Out] (f^a*(3*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]] + 2*Sqrt[b]*f^(b*x^2)*x*Sqrt[
Log[f]]*(-3 + 2*b*x^2*Log[f])))/(8*b^(5/2)*Log[f]^(5/2))
```

Maple [A]
time = 0.02, size = 75, normalized size = 0.91

method	result	size
meijerg	$\frac{f^a\left(-\frac{x(-b)^{\frac{5}{2}}\sqrt{\ln(f)}\,\left(-10b\,x^2\ln(f)+15\right)e^{b\,x^2\ln(f)}}{10b^2}+\frac{3(-b)^{\frac{5}{2}}\sqrt{\pi}\,\text{erfi}\left(x\sqrt{b}\,\sqrt{\ln(f)}\right)}{4b^{\frac{5}{2}}}\right)}{2\ln(f)^{\frac{5}{2}}b^2\sqrt{-b}}$	75
risch	$\frac{f^a x^3 f^{b\,x^2}}{2\ln(f)b} - \frac{3f^a x\,f^{b\,x^2}}{4\ln(f)^2b^2} + \frac{3f^a\sqrt{\pi}\,\text{erf}\left(\sqrt{-b\ln(f)}\,x\right)}{8\ln(f)^2b^2\sqrt{-b\ln(f)}}$	76

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*f^a/ln(f)^(5/2)/b^2/(-b)^(1/2)*(-1/10*x*(-b)^(5/2)*ln(f)^(1/2)*(-10*b*x
^2*ln(f)+15)/b^2*exp(b*x^2*ln(f))+3/4*(-b)^(5/2)/b^(5/2)*Pi^(1/2)*erfi(x*b^
(1/2)*ln(f)^(1/2)))
```

Maxima [A]
time = 0.28, size = 67, normalized size = 0.82

$$\frac{(2\,bf^ax^3\log(f) - 3\,f^ax)f^{bx^2}}{4\,b^2\log(f)^2} + \frac{3\sqrt{\pi}\,f^a\,\text{erf}\left(\sqrt{-b\log(f)}\,x\right)}{8\sqrt{-b\log(f)}\,b^2\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*(2*b*f^a*x^3*log(f) - 3*f^a*x)*f^(b*x^2)/(b^2*log(f)^2) + 3/8*sqrt(pi)*
f^a*erf(sqrt(-b*log(f))*x)/(sqrt(-b*log(f))*b^2*log(f)^2)
```

Fricas [A]
time = 0.37, size = 65, normalized size = 0.79

$$-\frac{3\sqrt{\pi}\sqrt{-b\log(f)}\,f^{a}\operatorname{erf}\left(\sqrt{-b\log(f)}\,x\right)-2\left(2\,b^{2}x^{3}\log(f)^{2}-3\,bx\log(f)\right)f^{bx^{2}+a}}{8\,b^{3}\log(f)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/8*(3*sqrt(pi)*sqrt(-b*log(f))*f^a*erf(sqrt(-b*log(f))*x) - 2*(2*b^2*x^3*
log(f)^2 - 3*b*x*log(f))*f^(b*x^2 + a))/(b^3*log(f)^3)
```

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

$$\int f^{a+bx^{2}}x^{4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x**4,x)
```

```
[Out] Integral(f**(a + b*x**2)*x**4, x)
```

Giac [A]
time = 2.27, size = 68, normalized size = 0.83

$$-\frac{3\sqrt{\pi}\,f^{a}\operatorname{erf}\left(-\sqrt{-b\log(f)}\,x\right)}{8\sqrt{-b\log(f)}\,b^{2}\log(f)^{2}}+\frac{(2\,bx^{3}\log(f)-3\,x)e^{\left(bx^{2}\log(f)+a\log(f)\right)}}{4\,b^{2}\log(f)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -3/8*sqrt(pi)*f^a*erf(-sqrt(-b*log(f))*x)/(sqrt(-b*log(f))*b^2*log(f)^2) +
1/4*(2*b*x^3*log(f) - 3*x)*e^(b*x^2*log(f) + a*log(f))/(b^2*log(f)^2)
```

Mupad [B]
time = 3.54, size = 75, normalized size = 0.91

$$\frac{f^{a}\left(3\sqrt{\pi}\operatorname{erfi}\left(\frac{b\,x\,\ln(f)}{\sqrt{b\,\ln(f)}}\right)-6\,f^{b\,x^{2}}\,x\,\sqrt{b\,\ln(f)}\right)}{8\,b^{2}\ln(f)^{2}\sqrt{b\,\ln(f)}}+\frac{f^{a}\,f^{b\,x^{2}}\,x^{3}}{2\,b\,\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x^4,x)
```

```
[Out] (f^a*(3*pi^(1/2)*erfi((b*x*log(f))/(b*log(f))^(1/2)) - 6*f^(b*x^2)*x*(b*log
(f))^(1/2)))/(8*b^2*log(f)^2*(b*log(f))^(1/2)) + (f^a*f^(b*x^2)*x^3)/(2*b*l
og(f))
```

3.87 $\int f^{a+bx^2}x^2\,dx$

Optimal. Leaf size=59

$$-\frac{f^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)}{4b^{3/2}\log^{\frac{3}{2}}(f)}+\frac{f^{a+bx^2}x}{2b\log(f)}$$

```
[Out] 1/2*f^(b*x^2+a)*x/b/ln(f)-1/4*f^a*erfi(x*b^(1/2)*ln(f)^(1/2))*Pi^(1/2)/b^(3
/2)/ln(f)^(3/2)
```

Rubi [A]
time = 0.03, antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2243, 2235}

$$\frac{xf^{a+bx^2}}{2b\log(f)}-\frac{\sqrt{\pi}\,f^a\mathrm{Erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)}{4b^{3/2}\log^{\frac{3}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x^2,x]
```

```
[Out] -1/4*(f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]])/(b^(3/2)*Log[f]^(3/2)) + (
f^(a + b*x^2)*x)/(2*b*Log[f])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int f^{a+bx^2}x^2\,dx = \frac{f^{a+bx^2}x}{2b\log(f)} - \frac{\int f^{a+bx^2}\,dx}{2b\log(f)}$$
$$= -\frac{f^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)}{4b^{3/2}\log^{\frac{3}{2}}(f)} + \frac{f^{a+bx^2}x}{2b\log(f)}$$

Mathematica [A]
time = 0.04, size = 59, normalized size = 1.00

$$-\frac{f^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)}{4b^{3/2}\log^{\frac{3}{2}}(f)} + \frac{f^{a+bx^2}x}{2b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x^2,x]
```

```
[Out] -1/4*(f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]])/(b^(3/2)*Log[f]^(3/2)) + (
f^(a + b*x^2)*x)/(2*b*Log[f])
```

Maple [A]
time = 0.02, size = 54, normalized size = 0.92

method	result	size
risch	$\frac{f^a x\, f^{b\,x^2}}{2\ln(f)b} - \frac{f^a\sqrt{\pi}\ \mathrm{erf}\left(\sqrt{-b\ln(f)}\ x\right)}{4\ln(f)b\sqrt{-b\ln(f)}}$	54
meijerg	$-\frac{f^a\left(\frac{x(-b)^{\frac{3}{2}}\sqrt{\ln(f)}\ \mathrm{e}^{b\,x^2\ln(f)}}{b} - \frac{(-b)^{\frac{3}{2}}\sqrt{\pi}\ \mathrm{erfi}\left(x\sqrt{b}\ \sqrt{\ln(f)}\right)}{2b^{\frac{3}{2}}}\right)}{2b\ln(f)^{\frac{3}{2}}\sqrt{-b}}$	64

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*f^a/ln(f)/b*x*f^(b*x^2)-1/4*f^a/ln(f)/b*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((
-b*ln(f))^(1/2)*x)
```

Maxima [A]
time = 0.29, size = 53, normalized size = 0.90

$$\frac{f^{bx^2}f^a x}{2\,b\log(f)} - \frac{\sqrt{\pi}\,f^a\,\mathrm{erf}\left(\sqrt{-b\log(f)}\,x\right)}{4\,\sqrt{-b\log(f)}\,b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*f^(b*x^2)*f^a*x/(b*log(f)) - 1/4*sqrt(pi)*f^a*erf(sqrt(-b*log(f))*x)/(s
qrt(-b*log(f))*b*log(f))
```

Fricas [A]
time = 0.48, size = 49, normalized size = 0.83

$$\frac{2\,bf^{bx^2+a}x\log\left(f\right)+\sqrt{\pi}\,\sqrt{-b\log\left(f\right)}\,f^a\,\mathrm{erf}\left(\sqrt{-b\log\left(f\right)}\,x\right)}{4\,b^2\log\left(f\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*(2*b*f^(b*x^2 + a)*x*log(f) + sqrt(pi)*sqrt(-b*log(f))*f^a*erf(sqrt(-b*
log(f))*x))/(b^2*log(f)^2)
```

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

$$\int f^{a+bx^2}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x**2,x)
```

```
[Out] Integral(f**(a + b*x**2)*x**2, x)
```

Giac [A]
time = 2.56, size = 57, normalized size = 0.97

$$\frac{\sqrt{\pi}\,f^a\,\mathrm{erf}\left(-\sqrt{-b\log\left(f\right)}\,x\right)}{4\,\sqrt{-b\log\left(f\right)}\,b\log\left(f\right)}+\frac{xe^{\left(bx^2\log\left(f\right)+a\log\left(f\right)\right)}}{2\,b\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*sqrt(pi)*f^a*erf(-sqrt(-b*log(f))*x)/(sqrt(-b*log(f))*b*log(f)) + 1/2*x
*e^(b*x^2*log(f) + a*log(f))/(b*log(f))
```

Mupad [B]
time = 3.61, size = 54, normalized size = 0.92

$$\frac{f^a\,f^{b\,x^2}\,x}{2\,b\,\ln\left(f\right)}-\frac{f^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln\left(f\right)}{\sqrt{b\,\ln\left(f\right)}}\right)}{4\,b\,\ln\left(f\right)\,\sqrt{b\,\ln\left(f\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x^2,x)
```

```
[Out] (f^a*f^(b*x^2)*x)/(2*b*log(f)) - (f^a*pi^(1/2)*erfi((b*x*log(f))/(b*log(f))
^(1/2)))/(4*b*log(f)*(b*log(f))^(1/2))
```

3.88 $\int f^{a+bx^2}\,dx$

Optimal. Leaf size=37

$$\frac{f^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)}{2\sqrt{b}\,\sqrt{\log(f)}}$$

```
[Out] 1/2*f^a*erfi(x*b^(1/2)*ln(f)^(1/2))*Pi^(1/2)/b^(1/2)/ln(f)^(1/2)
```

Rubi [A]
time = 0.01, antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2235}

$$\frac{\sqrt{\pi}\,f^a\mathrm{Erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)}{2\sqrt{b}\,\sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2),x]
[Out] (f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]])/(2*Sqrt[b]*Sqrt[Log[f]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rubi steps

$$\int f^{a+bx^2}\,dx=\frac{f^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)}{2\sqrt{b}\,\sqrt{\log(f)}}$$

Mathematica [A]
time = 0.03, size = 37, normalized size = 1.00

$$\frac{f^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)}{2\sqrt{b}\,\sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2),x]
```

```
[Out] (f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]])/(2*Sqrt[b]*Sqrt[Log[f]])
```

Maple [A]
time = 0.02, size = 26, normalized size = 0.70

method	result	size
meijerg	$\frac{f^{a} \operatorname{erfi}\left(x \sqrt{b}\, \sqrt{\ln \left(f \right)}\right) \sqrt{\pi}}{2 \sqrt{b}\, \sqrt{\ln \left(f \right)}}$	26
risch	$\frac{f^{a} \sqrt{\pi}\, \operatorname{erf}\left(\sqrt{-b \ln \left(f \right)}\, x \right)}{2 \sqrt{-b \ln \left(f \right)}}$	26

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a),x,method=_RETURNVERBOSE)
[Out] 1/2*f^a*erfi(x*b^(1/2)*ln(f)^(1/2))*Pi^(1/2)/b^(1/2)/ln(f)^(1/2)
```

Maxima [A]
time = 0.28, size = 25, normalized size = 0.68

$$\frac{\sqrt{\pi} f^{a} \operatorname{erf}\left(\sqrt{-b \log\left(f\right)} x\right)}{2 \sqrt{-b \log\left(f\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a),x, algorithm="maxima")
[Out] 1/2*sqrt(pi)*f^a*erf(sqrt(-b*log(f))*x)/sqrt(-b*log(f))
```

Fricas [A]
time = 0.36, size = 32, normalized size = 0.86

$$-\frac{\sqrt{\pi} \sqrt{-b \log\left(f\right)} f^{a} \operatorname{erf}\left(\sqrt{-b \log\left(f\right)} x\right)}{2 \, b \log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a),x, algorithm="fricas")
[Out] -1/2*sqrt(pi)*sqrt(-b*log(f))*f^a*erf(sqrt(-b*log(f))*x)/(b*log(f))
```

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

$$\int f^{a + b x^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a),x)
```

```
[Out] Integral(f**(a + b*x**2), x)
```

Giac [A]
time = 2.06, size = 26, normalized size = 0.70

$$-\frac{\sqrt{\pi}\, f^a \operatorname{erf}\left(-\sqrt{-b\log\left(f\right)}\, x\right)}{2\,\sqrt{-b\log\left(f\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*sqrt(pi)*f^a*erf(-sqrt(-b*log(f))*x)/sqrt(-b*log(f))
```

Mupad [B]
time = 3.55, size = 26, normalized size = 0.70

$$\frac{f^a\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b\,x\,\ln(f)}{\sqrt{b\,\ln\left(f\right)}}\right)}{2\,\sqrt{b\,\ln\left(f\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2),x)
```

```
[Out] (f^a*pi^(1/2)*erfi((b*x*log(f))/(b*log(f))^(1/2)))/(2*(b*log(f))^(1/2))
```

3.89 $\int \frac{f^{a+bx^2}}{x^2} \, dx$

Optimal. Leaf size=49

$$-\frac{f^{a+bx^2}}{x}+\sqrt{b}\, f^a \sqrt{\pi}\, \text{erfi}\left(\sqrt{b}\, x \sqrt{\log(f)}\right) \sqrt{\log(f)}$$

```
[Out] -f^(b*x^2+a)/x+f^a*erfi(x*b^(1/2)*ln(f)^(1/2))*b^(1/2)*Pi^(1/2)*ln(f)^(1/2)
```

Rubi [A]
time = 0.03, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2245, 2235}

$$\sqrt{\pi}\, \sqrt{b}\, f^a \sqrt{\log(f)}\, \text{Erfi}\left(\sqrt{b}\, x \sqrt{\log(f)}\right)-\frac{f^{a+bx^2}}{x}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)/x^2,x]
```

```
[Out] -(f^(a + b*x^2)/x) + Sqrt[b]*f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]]*Sqrt
[Log[f]]
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int \frac{f^{a+bx^2}}{x^2} \, dx &= -\frac{f^{a+bx^2}}{x}+(2b\log(f))\int f^{a+bx^2} \, dx\\ &= -\frac{f^{a+bx^2}}{x}+\sqrt{b}\, f^a \sqrt{\pi}\, \text{erfi}\left(\sqrt{b}\, x \sqrt{\log(f)}\right) \sqrt{\log(f)}\end{aligned}$$

Mathematica [A]
time = 0.05, size = 49, normalized size = 1.00

$$-\frac{f^{a+bx^2}}{x}+\sqrt{b}\,f^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)\sqrt{\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)/x^2,x]
```

```
[Out] -(f^(a + b*x^2)/x) + Sqrt[b]*f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]]*Sqrt
[Log[f]]
```

Maple [A]
time = 0.02, size = 44, normalized size = 0.90

method	result	size
risch	$-\frac{f^a f^{b\,x^2}}{x}+\frac{f^a \ln(f) b\sqrt{\pi}\ \mathrm{erf}\left(\sqrt{-b\ln(f)}\ x\right)}{\sqrt{-b\ln(f)}}$	44
meijerg	$-\frac{f^a b\sqrt{\ln(f)}\left(-\frac{2\,\mathrm{e}^{b\,x^2\ln(f)}}{x\sqrt{-b}\ \sqrt{\ln(f)}}+\frac{2\sqrt{b}\ \sqrt{\pi}\ \mathrm{erfi}\left(x\sqrt{b}\ \sqrt{\ln(f)}\right)}{\sqrt{-b}}\right)}{2\sqrt{-b}}$	62

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] -f^a/x*f^(b*x^2)+f^a*ln(f)*b*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(1/2)
*x)
```

Maxima [A]
time = 0.34, size = 28, normalized size = 0.57

$$-\frac{\sqrt{-bx^2\log(f)}\,f^a\Gamma\left(-\frac{1}{2},-bx^2\log(f)\right)}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*sqrt(-b*x^2*log(f))*f^a*gamma(-1/2, -b*x^2*log(f))/x
```

Fricas [A]
time = 0.36, size = 40, normalized size = 0.82

$$-\frac{\sqrt{\pi}\,\sqrt{-b\log(f)}\,f^a x\,\mathrm{erf}\left(\sqrt{-b\log(f)}\,x\right)+f^{bx^2+a}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -(sqrt(pi)*sqrt(-b*log(f))*f^a*x*erf(sqrt(-b*log(f))*x) + f^(b*x^2 + a))/x
```

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

$$\int \frac{f^{a+bx^2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)/x**2,x)
```

```
[Out] Integral(f**(a + b*x**2)/x**2, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^(b*x^2 + a)/x^2, x)
```

Mupad [B]
time = 3.47, size = 44, normalized size = 0.90

$$\frac{b\,f^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln(f)}{\sqrt{b\,\ln\left(f\right)}}\right)\,\ln\left(f\right)}{\sqrt{b\,\ln\left(f\right)}}-\frac{f^a\,f^{b\,x^2}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)/x^2,x)
```

```
[Out] (b*f^a*pi^(1/2)*erfi((b*x*log(f))/(b*log(f))^(1/2))*log(f))/(b*log(f))^(1/2
) - (f^a*f^(b*x^2))/x
```

3.90 $\int \frac{f^{a+bx^2}}{x^4}\,dx$

Optimal. Leaf size=73

$$-\frac{f^{a+bx^2}}{3x^3}-\frac{2bf^{a+bx^2}\log(f)}{3x}+\frac{2}{3}b^{3/2}f^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)\log^{\frac{3}{2}}(f)$$

```
[Out] -1/3*f^(b*x^2+a)/x^3-2/3*b*f^(b*x^2+a)*ln(f)/x+2/3*b^(3/2)*f^a*erfi(x*b^(1/
2)*ln(f)^(1/2))*ln(f)^(3/2)*Pi^(1/2)
```

Rubi [A]
time = 0.04, antiderivative size = 73, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}=0.154$, Rules used = {2245, 2235}

$$\frac{2}{3}\sqrt{\pi}\,b^{3/2}f^a\log^{\frac{3}{2}}(f)\mathrm{Erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)-\frac{2b\log(f)f^{a+bx^2}}{3x}-\frac{f^{a+bx^2}}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)/x^4,x]
```

```
[Out] -1/3*f^(a + b*x^2)/x^3 - (2*b*f^(a + b*x^2)*Log[f])/(3*x) + (2*b^(3/2)*f^a*
Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]]*Log[f]^(3/2))/3
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int \frac{f^{a+bx^2}}{x^4}\,dx = -\frac{f^{a+bx^2}}{3x^3} + \frac{1}{3}(2b\log(f))\int \frac{f^{a+bx^2}}{x^2}\,dx$$
$$= -\frac{f^{a+bx^2}}{3x^3} - \frac{2bf^{a+bx^2}\log(f)}{3x} + \frac{1}{3}\left(4b^2\log^2(f)\right)\int f^{a+bx^2}\,dx$$
$$= -\frac{f^{a+bx^2}}{3x^3} - \frac{2bf^{a+bx^2}\log(f)}{3x} + \frac{2}{3}b^{3/2}f^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)\log^{\frac{3}{2}}(f)$$

Mathematica [A]
time = 0.07, size = 62, normalized size = 0.85

$$\frac{1}{3}f^a\left(2b^{3/2}\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)\log^{\frac{3}{2}}(f) - \frac{f^{bx^2}(1+2bx^2\log(f))}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)/x^4,x]
```

```
[Out] (f^a*(2*b^(3/2)*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]]*Log[f]^(3/2) - (f^(b*
x^2)*(1 + 2*b*x^2*Log[f]))/x^3))/3
```

Maple [A]
time = 0.02, size = 67, normalized size = 0.92

method	result	size
risch	$-\frac{f^a f^{b\,x^2}}{3x^3} - \frac{2f^a\ln(f)b\,f^{b\,x^2}}{3x} + \frac{2f^a\ln(f)^2 b^2\sqrt{\pi}\;\mathrm{erf}\left(\sqrt{-b\ln(f)}\;x\right)}{3\sqrt{-b\ln(f)}}$	67
meijerg	$\frac{f^a\ln(f)^{\frac{3}{2}}b^2\left(-\frac{2\left(2b\,x^2\ln(f)+1\right)\mathrm{e}^{b\,x^2\ln(f)}}{3x^3(-b)^{\frac{3}{2}}\ln(f)^{\frac{3}{2}}}+\frac{4b^{\frac{3}{2}}\sqrt{\pi}\;\mathrm{erfi}\left(x\sqrt{b}\;\sqrt{\ln(f)}\right)}{3(-b)^{\frac{3}{2}}}\right)}{2\sqrt{-b}}$	74

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*f^a/x^3*f^(b*x^2)-2/3*f^a*ln(f)*b/x*f^(b*x^2)+2/3*f^a*ln(f)^2*b^2*Pi^(
1/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(1/2)*x)
```

Maxima [A]
time = 0.32, size = 28, normalized size = 0.38

$$-\frac{\left(-bx^2\log(f)\right)^{\frac{3}{2}}f^a\Gamma\left(-\frac{3}{2}, -bx^2\log(f)\right)}{2\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^4,x, algorithm="maxima")
```

```
[Out] -1/2*(-b*x^2*log(f))^(3/2)*f^a*gamma(-3/2, -b*x^2*log(f))/x^3
```

Fricas [A]
time = 0.37, size = 57, normalized size = 0.78

$$-\frac{2\sqrt{\pi}\sqrt{-b\log(f)}\,bf^a x^3 \operatorname{erf}\left(\sqrt{-b\log(f)}\,x\right)\log(f)+(2\,bx^2\log(f)+1)f^{bx^2+a}}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^4,x, algorithm="fricas")
```

```
[Out] -1/3*(2*sqrt(pi)*sqrt(-b*log(f))*b*f^a*x^3*erf(sqrt(-b*log(f))*x)*log(f) +
(2*b*x^2*log(f) + 1)*f^(b*x^2 + a))/x^3
```

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

$$\int \frac{f^{a+bx^2}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)/x**4,x)
```

```
[Out] Integral(f**(a + b*x**2)/x**4, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^4,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^2 + a)/x^4, x)
```

Mupad [B]
time = 3.56, size = 70, normalized size = 0.96

$$\frac{2\,b^2\,f^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln(f)}{\sqrt{b\,\ln(f)}}\right)\,\ln(f)^2}{3\,\sqrt{b\,\ln(f)}}-\frac{\frac{f^a\,f^{b\,x^2}}{3}+\frac{2\,b\,f^a\,f^{b\,x^2}\,x^2\,\ln(f)}{3}}{x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)/x^4,x)
```

```
[Out] (2*b^2*f^a*pi^(1/2)*erfi((b*x*log(f))/(b*log(f))^(1/2))*log(f)^2)/(3*(b*log
(f))^(1/2)) - ((f^a*f^(b*x^2))/3 + (2*b*f^a*f^(b*x^2)*x^2*log(f))/3)/x^3
```

3.91 $\int \frac{f^{a+bx^2}}{x^6} dx$

Optimal. Leaf size=96

$$-\frac{f^{a+bx^2}}{5x^5}-\frac{2bf^{a+bx^2}\log(f)}{15x^3}-\frac{4b^2f^{a+bx^2}\log^2(f)}{15x}+\frac{4}{15}b^{5/2}f^a\sqrt{\pi}\operatorname{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)\log^{\frac{5}{2}}(f)$$

```
[Out] -1/5*f^(b*x^2+a)/x^5-2/15*b*f^(b*x^2+a)*ln(f)/x^3-4/15*b^2*f^(b*x^2+a)*ln(f
)^2/x+4/15*b^(5/2)*f^a*erfi(x*b^(1/2)*ln(f)^(1/2))*ln(f)^(5/2)*Pi^(1/2)
```

Rubi [A]
time = 0.06, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2245, 2235}

$$\frac{4}{15}\sqrt{\pi}\,b^{5/2}f^a\log^{\frac{5}{2}}(f)\operatorname{Erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)-\frac{4b^2\log^2(f)f^{a+bx^2}}{15x}-\frac{f^{a+bx^2}}{5x^5}-\frac{2b\log(f)f^{a+bx^2}}{15x^3}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)/x^6,x]
```

```
[Out] -1/5*f^(a + b*x^2)/x^5 - (2*b*f^(a + b*x^2)*Log[f])/(15*x^3) - (4*b^2*f^(a
+ b*x^2)*Log[f]^2)/(15*x) + (4*b^(5/2)*f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log
[f]]]*Log[f]^(5/2))/15
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int \frac{f^{a+bx^2}}{x^6}\,dx = -\frac{f^{a+bx^2}}{5x^5} + \frac{1}{5}(2b\log(f))\int \frac{f^{a+bx^2}}{x^4}\,dx$$
$$= -\frac{f^{a+bx^2}}{5x^5} - \frac{2bf^{a+bx^2}\log(f)}{15x^3} + \frac{1}{15}\left(4b^2\log^2(f)\right)\int \frac{f^{a+bx^2}}{x^2}\,dx$$
$$= -\frac{f^{a+bx^2}}{5x^5} - \frac{2bf^{a+bx^2}\log(f)}{15x^3} - \frac{4b^2f^{a+bx^2}\log^2(f)}{15x} + \frac{1}{15}\left(8b^3\log^3(f)\right)\int f^{a+bx^2}\,dx$$
$$= -\frac{f^{a+bx^2}}{5x^5} - \frac{2bf^{a+bx^2}\log(f)}{15x^3} - \frac{4b^2f^{a+bx^2}\log^2(f)}{15x} + \frac{4}{15}b^{5/2}f^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)\log^{\frac{5}{2}}(f)$$

Mathematica [A]
time = 0.06, size = 77, normalized size = 0.80

$$\frac{f^a\left(4b^{5/2}\sqrt{\pi}\,x^5\text{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)\log^{\frac{5}{2}}(f) - f^{bx^2}\left(3+2bx^2\log(f)+4b^2x^4\log^2(f)\right)\right)}{15x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)/x^6,x]
[Out] (f^a*(4*b^(5/2)*Sqrt[Pi]*x^5*Erfi[Sqrt[b]*x*Sqrt[Log[f]]]*Log[f]^(5/2) - f^
(b*x^2)*(3 + 2*b*x^2*Log[f] + 4*b^2*x^4*Log[f]^2)))/(15*x^5)
```

Maple [A]
time = 0.03, size = 86, normalized size = 0.90

method	result	size
meijerg	$-\frac{f^a\ln(f)^{\frac{5}{2}}b^3\left(-\frac{2\left(\frac{4b^2x^4\ln(f)^2}{3}+\frac{2b\,x^2\ln(f)}{3}+1\right)e^{b\,x^2\ln(f)}}{5x^5(-b)^{\frac{5}{2}}\ln(f)^{\frac{5}{2}}}+\frac{8b^{\frac{5}{2}}\sqrt{\pi}\,\text{erfi}\left(x\sqrt{b}\,\sqrt{\ln(f)}\right)}{15(-b)^{\frac{5}{2}}}\right)}{2\sqrt{-b}}$	86
risch	$-\frac{f^a f^{b\,x^2}}{5x^5}-\frac{2f^a\ln(f)b\,f^{b\,x^2}}{15x^3}-\frac{4f^a\ln(f)^2b^2f^{b\,x^2}}{15x}+\frac{4f^a\ln(f)^3b^3\sqrt{\pi}\,\text{erf}\left(\sqrt{-b\ln(f)}\,x\right)}{15\sqrt{-b\ln(f)}}$	89

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)/x^6,x,method=_RETURNVERBOSE)
[Out] -1/2*f^a*ln(f)^(5/2)*b^3/(-b)^(1/2)*(-2/5/x^5/(-b)^(5/2)/ln(f)^(5/2)*(4/3*b
^2*x^4*ln(f)^2+2/3*b*x^2*ln(f)+1)*exp(b*x^2*ln(f))+8/15/(-b)^(5/2)*b^(5/2)*
Pi^(1/2)*erfi(x*b^(1/2)*ln(f)^(1/2)))
```

Maxima [A]
time = 0.33, size = 28, normalized size = 0.29

$$-\frac{\left(-bx^2\log\left(f\right)\right)^{\frac{5}{2}}f^a\Gamma\left(-\frac{5}{2},-bx^2\log\left(f\right)\right)}{2\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^6,x, algorithm="maxima")
[Out] -1/2*(-b*x^2*log(f))^(5/2)*f^a*gamma(-5/2, -b*x^2*log(f))/x^5
```

Fricas [A]
time = 0.38, size = 73, normalized size = 0.76

$$-\frac{4\sqrt{\pi}\sqrt{-b\log\left(f\right)}b^2f^ax^5\operatorname{erf}\left(\sqrt{-b\log\left(f\right)}x\right)\log\left(f\right)^2+\left(4\,b^2x^4\log\left(f\right)^2+2\,bx^2\log\left(f\right)+3\right)f^{bx^2+a}}{15\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^6,x, algorithm="fricas")
[Out] -1/15*(4*sqrt(pi)*sqrt(-b*log(f))*b^2*f^a*x^5*erf(sqrt(-b*log(f))*x)*log(f)
^2 + (4*b^2*x^4*log(f)^2 + 2*b*x^2*log(f) + 3)*f^(b*x^2 + a))/x^5
```

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

$$\int\frac{f^{a+bx^2}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)/x**6,x)
[Out] Integral(f**(a + b*x**2)/x**6, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^6,x, algorithm="giac")
[Out] integrate(f^(b*x^2 + a)/x^6, x)
```

Mupad [B]
time = 3.56, size = 109, normalized size = 1.14

$$\frac{4\,f^a\,\sqrt{\pi}\,\mathrm{erfc}\left(\sqrt{-b\,x^2\,\ln\left(f\right)}\right)\,{\left(-b\,x^2\,\ln\left(f\right)\right)}^{5/2}}{15\,x^5}-\frac{4\,f^a\,\sqrt{\pi}\,{\left(-b\,x^2\,\ln\left(f\right)\right)}^{5/2}}{15\,x^5}-\frac{f^a\,f^{b\,x^2}}{5\,x^5}-\frac{4\,b^2\,f^a\,f^{b\,x^2}\,{\ln\left(f\right)}^2}{15\,x}-\frac{2\,b\,f^a\,f^{b\,x^2}\,\ln\left(f\right)}{15\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)/x^6,x)
```

```
[Out] (4*f^a*pi^(1/2)*erfc((-b*x^2*log(f))^(1/2))*(-b*x^2*log(f))^(5/2))/(15*x^5)
 - (4*f^a*pi^(1/2)*(-b*x^2*log(f))^(5/2))/(15*x^5) - (f^a*f^(b*x^2))/(5*x^5
) - (4*b^2*f^a*f^(b*x^2)*log(f)^2)/(15*x) - (2*b*f^a*f^(b*x^2)*log(f))/(15*
x^3)
```

3.92 $\int \frac{f^{a+bx^2}}{x^8} \, dx$

Optimal. Leaf size=119

$$-\frac{f^{a+bx^2}}{7x^7}-\frac{2bf^{a+bx^2}\log(f)}{35x^5}-\frac{4b^2f^{a+bx^2}\log^2(f)}{105x^3}-\frac{8b^3f^{a+bx^2}\log^3(f)}{105x}+\frac{8}{105}b^{7/2}f^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)\log^{\frac{7}{2}}$$

```
[Out] -1/7*f^(b*x^2+a)/x^7-2/35*b*f^(b*x^2+a)*ln(f)/x^5-4/105*b^2*f^(b*x^2+a)*ln(
f)^2/x^3-8/105*b^3*f^(b*x^2+a)*ln(f)^3/x+8/105*b^(7/2)*f^a*erfi(x*b^(1/2)*l
n(f)^(1/2))*ln(f)^(7/2)*Pi^(1/2)
```

Rubi [A]
time = 0.07, antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2245, 2235}

$$\frac{8}{105}\sqrt{\pi}\,b^{7/2}f^a\log^{\frac{7}{2}}(f)\text{Erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)-\frac{8b^3\log^3(f)f^{a+bx^2}}{105x}-\frac{4b^2\log^2(f)f^{a+bx^2}}{105x^3}-\frac{f^{a+bx^2}}{7x^7}-\frac{2b\log(f)f^{a+bx^2}}{35x^5}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)/x^8,x]
```

```
[Out] -1/7*f^(a + b*x^2)/x^7 - (2*b*f^(a + b*x^2)*Log[f])/(35*x^5) - (4*b^2*f^(a
+ b*x^2)*Log[f]^2)/(105*x^3) - (8*b^3*f^(a + b*x^2)*Log[f]^3)/(105*x) + (8*
b^(7/2)*f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]]*Log[f]^(7/2))/105
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int \frac{f^{a+bx^2}}{x^8}\,dx = -\frac{f^{a+bx^2}}{7x^7} + \frac{1}{7}(2b\log(f))\int \frac{f^{a+bx^2}}{x^6}\,dx$$
$$= -\frac{f^{a+bx^2}}{7x^7} - \frac{2bf^{a+bx^2}\log(f)}{35x^5} + \frac{1}{35}\left(4b^2\log^2(f)\right)\int \frac{f^{a+bx^2}}{x^4}\,dx$$
$$= -\frac{f^{a+bx^2}}{7x^7} - \frac{2bf^{a+bx^2}\log(f)}{35x^5} - \frac{4b^2f^{a+bx^2}\log^2(f)}{105x^3} + \frac{1}{105}\left(8b^3\log^3(f)\right)\int \frac{f^{a+bx^2}}{x^2}\,dx$$
$$= -\frac{f^{a+bx^2}}{7x^7} - \frac{2bf^{a+bx^2}\log(f)}{35x^5} - \frac{4b^2f^{a+bx^2}\log^2(f)}{105x^3} - \frac{8b^3f^{a+bx^2}\log^3(f)}{105x} + \frac{1}{105}\left(16b^4\log^4(f)\right)\int f$$
$$= -\frac{f^{a+bx^2}}{7x^7} - \frac{2bf^{a+bx^2}\log(f)}{35x^5} - \frac{4b^2f^{a+bx^2}\log^2(f)}{105x^3} - \frac{8b^3f^{a+bx^2}\log^3(f)}{105x} + \frac{8}{105}b^{7/2}f^a\sqrt{\pi}\,\text{erfi}\Big(\sqrt{b}$$

Mathematica [A]
time = 0.07, size = 89, normalized size = 0.75

$$\frac{f^a\left(8b^{7/2}\sqrt{\pi}\,x^7\text{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)\log^{\frac{7}{2}}(f) - f^{bx^2}\left(15+6bx^2\log(f)+4b^2x^4\log^2(f)+8b^3x^6\log^3(f)\right)\right)}{105x^7}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)/x^8,x]
```

```
[Out] (f^a*(8*b^(7/2)*Sqrt[Pi]*x^7*Erfi[Sqrt[b]*x*Sqrt[Log[f]]]*Log[f]^(7/2) - f^
(b*x^2)*(15 + 6*b*x^2*Log[f] + 4*b^2*x^4*Log[f]^2 + 8*b^3*x^6*Log[f]^3)))/(
105*x^7)
```

Maple [A]
time = 0.04, size = 98, normalized size = 0.82

method	result	size
meijerg	$\frac{f^a b^4 \ln(f)^{\frac{7}{2}}\left(-\frac{2\left(\frac{8b^3x^6\ln(f)^3}{15}+\frac{4b^2x^4\ln(f)^2}{15}+\frac{2bx^2\ln(f)}{5}+1\right)e^{bx^2\ln(f)}}{7x^7(-b)^{\frac{7}{2}}\ln(f)^{\frac{7}{2}}}+\frac{16b^{\frac{7}{2}}\sqrt{\pi}\,\text{erfi}\left(x\sqrt{b}\,\sqrt{\ln(f)}\right)}{105(-b)^{\frac{7}{2}}}\right)}{2\sqrt{-b}}$	98
risch	$-\frac{f^a f^{bx^2}}{7x^7}-\frac{2f^a\ln(f)bf^{bx^2}}{35x^5}-\frac{4f^a\ln(f)^2b^2f^{bx^2}}{105x^3}-\frac{8f^a\ln(f)^3b^3f^{bx^2}}{105x}+\frac{8f^a\ln(f)^4b^4\sqrt{\pi}\,\text{erf}\left(\sqrt{-b\ln(f)}\,x\right)}{105\sqrt{-b\ln(f)}}$	111

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)/x^8,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*f^a*b^4*ln(f)^(7/2)/(-b)^(1/2)*(-2/7/x^7/(-b)^(7/2)/ln(f)^(7/2)*(8/15*b
^3*x^6*ln(f)^3+4/15*b^2*x^4*ln(f)^2+2/5*b*x^2*ln(f)+1)*exp(b*x^2*ln(f))+16/
105/(-b)^(7/2)*b^(7/2)*Pi^(1/2)*erfi(x*b^(1/2)*ln(f)^(1/2)))
```

Maxima [A]
time = 0.32, size = 28, normalized size = 0.24

$$-\frac{\left(-bx^2\log\left(f\right)\right)^{\frac{7}{2}}f^a\Gamma\left(-\frac{7}{2},-bx^2\log\left(f\right)\right)}{2\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^8,x, algorithm="maxima")
```

```
[Out] -1/2*(-b*x^2*log(f))^(7/2)*f^a*gamma(-7/2, -b*x^2*log(f))/x^7
```

Fricas [A]
time = 0.40, size = 85, normalized size = 0.71

$$-\frac{8\,\sqrt{\pi}\,\sqrt{-b\log\left(f\right)}\,b^3f^ax^7\,\mathrm{erf}\left(\sqrt{-b\log\left(f\right)}\,x\right)\log\left(f\right)^3+\left(8\,b^3x^6\log\left(f\right)^3+4\,b^2x^4\log\left(f\right)^2+6\,bx^2\log\left(f\right)+15\right)f^{bx^2+a}}{105\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^8,x, algorithm="fricas")
```

```
[Out] -1/105*(8*sqrt(pi)*sqrt(-b*log(f))*b^3*f^a*x^7*erf(sqrt(-b*log(f))*x)*log(f
)^3 + (8*b^3*x^6*log(f)^3 + 4*b^2*x^4*log(f)^2 + 6*b*x^2*log(f) + 15)*f^(b*
x^2 + a))/x^7
```

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

$$\int\frac{f^{a+bx^2}}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)/x**8,x)
```

```
[Out] Integral(f**(a + b*x**2)/x**8, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^8,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^2 + a)/x^8, x)
```

Mupad [B]
time = 3.49, size = 131, normalized size = 1.10

$$\frac{8\,f^a\,\sqrt{\pi}\,\left(-b\,x^2\,\ln\left(f\right)\right)^{7/2}}{105\,x^7}-\frac{f^a\,f^{b\,x^2}}{7\,x^7}-\frac{8\,f^a\,\sqrt{\pi}\,\mathrm{erfc}\left(\sqrt{-b\,x^2\,\ln\left(f\right)}\right)\,\left(-b\,x^2\,\ln\left(f\right)\right)^{7/2}}{105\,x^7}-\frac{4\,b^2\,f^a\,f^{b\,x^2}\,\ln\left(f\right)^2}{105\,x^3}-\frac{8\,b^3\,f^a\,f^{b\,x^2}\,\ln\left(f\right)^3}{105\,x}-\frac{2\,b\,f^a\,f^{b\,x^2}\,\ln\left(f\right)}{35\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)/x^8,x)
```

```
[Out] (8*f^a*pi^(1/2)*(-b*x^2*log(f))^(7/2))/(105*x^7) - (f^a*f^(b*x^2))/(7*x^7)
- (8*f^a*pi^(1/2)*erfc((-b*x^2*log(f))^(1/2))*(-b*x^2*log(f))^(7/2))/(105*x
^7) - (4*b^2*f^a*f^(b*x^2)*log(f)^2)/(105*x^3) - (8*b^3*f^a*f^(b*x^2)*log(f
)^3)/(105*x) - (2*b*f^a*f^(b*x^2)*log(f))/(35*x^5)
```

3.93 $\int \frac{f^{a+bx^2}}{x^{10}} \, dx$

Optimal. Leaf size=34

$$-\frac{f^a \Gamma\left(-\frac{9}{2}, -bx^2 \log(f)\right) \left(-bx^2 \log(f)\right)^{9/2}}{2x^9}$$

```
[Out] -1/2*f^a*(-32/945*Pi^(1/2)*erfc((-b*x^2*ln(f))^(1/2))+32/945/(-b*x^2*ln(f))
^(1/2)*exp(b*x^2*ln(f))-16/945/(-b*x^2*ln(f))^(3/2)*exp(b*x^2*ln(f))+8/315/
(-b*x^2*ln(f))^(5/2)*exp(b*x^2*ln(f))-4/63/(-b*x^2*ln(f))^(7/2)*exp(b*x^2*l
n(f))+2/9/(-b*x^2*ln(f))^(9/2)*exp(b*x^2*ln(f)))*(-b*x^2*ln(f))^(9/2)/x^9
```

Rubi [A]
time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$-\frac{f^a \left(-bx^2 \log(f)\right)^{9/2} \text{Gamma}\left(-\frac{9}{2}, -bx^2 \log(f)\right)}{2x^9}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)/x^10,x]
```

```
[Out] -1/2*(f^a*Gamma[-9/2, -(b*x^2*Log[f])]*(-(b*x^2*Log[f]))^(9/2))/x^9
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^2}}{x^{10}} \, dx = -\frac{f^a \Gamma\left(-\frac{9}{2}, -bx^2 \log(f)\right) \left(-bx^2 \log(f)\right)^{9/2}}{2x^9}$$

Mathematica [A]
time = 0.05, size = 34, normalized size = 1.00

$$-\frac{f^a \Gamma\left(-\frac{9}{2}, -bx^2 \log(f)\right) \left(-bx^2 \log(f)\right)^{9/2}}{2x^9}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)/x^10,x]
```

```
[Out] -1/2*(f^a*Gamma[-9/2, -(b*x^2*Log[f])]*(-(b*x^2*Log[f]))^(9/2))/x^9
```

Maple [A]
time = 0.04, size = 110, normalized size = 3.24

method	result
meijerg	$-\frac{f^a b^5 \ln(f)^{\frac{9}{2}}\left(-\frac{2\left(\frac{16 b^4 x^8 \ln(f)^4}{105}+\frac{8 b^3 x^6 \ln(f)^3}{105}+\frac{4 b^2 x^4 \ln(f)^2}{35}+\frac{2 b x^2 \ln(f)}{7}+1\right) e^{b x^2 \ln(f)}}{9 x^9 (-b)^{\frac{9}{2}} \ln(f)^{\frac{9}{2}}}+\frac{32 b^{\frac{9}{2}} \sqrt{\pi}\, \mathrm{erfi}\left(x \sqrt{b}\, \sqrt{\ln(f)}\right)}{945 (-b)^{\frac{9}{2}}}\right)}{2\sqrt{-b}}$
risch	$-\frac{f^a f^{b x^2}}{9x^9}-\frac{2 f^a \ln(f) b f^{b x^2}}{63 x^7}-\frac{4 f^a \ln(f)^2 b^2 f^{b x^2}}{315 x^5}-\frac{8 f^a \ln(f)^3 b^3 f^{b x^2}}{945 x^3}-\frac{16 f^a \ln(f)^4 b^4 f^{b x^2}}{945 x}+\frac{16 f^a \ln(f)^5 b^5 \sqrt{\pi}\, \mathrm{erf}\left(\sqrt{-}\right.}{945\sqrt{-b \ln(}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)/x^10,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*f^a*b^5*ln(f)^(9/2)/(-b)^(1/2)*(-2/9/x^9/(-b)^(9/2)/ln(f)^(9/2)*(16/10
5*b^4*x^8*ln(f)^4+8/105*b^3*x^6*ln(f)^3+4/35*b^2*x^4*ln(f)^2+2/7*b*x^2*ln(f
)+1)*exp(b*x^2*ln(f))+32/945/(-b)^(9/2)*b^(9/2)*Pi^(1/2)*erfi(x*b^(1/2)*ln(
f)^(1/2)))
```

Maxima [A]
time = 0.33, size = 28, normalized size = 0.82

$$-\frac{\left(-b x^2 \log(f)\right)^{\frac{9}{2}} f^a \Gamma\left(-\frac{9}{2}, -b x^2 \log(f)\right)}{2\, x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^10,x, algorithm="maxima")
```

```
[Out] -1/2*(-b*x^2*log(f))^(9/2)*f^a*gamma(-9/2, -b*x^2*log(f))/x^9
```

Fricas [A]
time = 0.38, size = 97, normalized size = 2.85

$$-\frac{16\sqrt{\pi}\,\sqrt{-b\log(f)}\, b^4 f^a x^9 \operatorname{erf}\left(\sqrt{-b\log(f)}\, x\right)\log(f)^4+\left(16 b^4 x^8 \log(f)^4+8 b^3 x^6 \log(f)^3+12 b^2 x^4 \log(f)^2+30 b x^2 \log(f)+105\right) f^{b x^2+a}}{945\, x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^10,x, algorithm="fricas")
```

```
[Out] -1/945*(16*sqrt(pi)*sqrt(-b*log(f))*b^4*f^a*x^9*erf(sqrt(-b*log(f))*x)*log(
f)^4 + (16*b^4*x^8*log(f)^4 + 8*b^3*x^6*log(f)^3 + 12*b^2*x^4*log(f)^2 + 30
*b*x^2*log(f) + 105)*f^(b*x^2 + a))/x^9
```

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

$$\int \frac{f^{a+bx^2}}{x^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)/x**10,x)
```

```
[Out] Integral(f**(a + b*x**2)/x**10, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^10,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^2 + a)/x^10, x)
```

Mupad [B]
time = 3.51, size = 153, normalized size = 4.50

$$\frac{16\,f^a\,\sqrt{\pi}\,\mathrm{erfc}\left(\sqrt{-b\,x^2\,\ln\left(f\right)}\right)\,{\left(-b\,x^2\,\ln\left(f\right)\right)}^{9/2}}{945\,x^9}-\frac{16\,f^a\,\sqrt{\pi}\,{\left(-b\,x^2\,\ln\left(f\right)\right)}^{9/2}}{945\,x^9}-\frac{f^a\,f^{b\,x^2}}{9\,x^9}-\frac{4\,b^2\,f^a\,f^{b\,x^2}\,{\ln\left(f\right)}^2}{315\,x^5}-\frac{8\,b^3\,f^a\,f^{b\,x^2}\,{\ln\left(f\right)}^3}{945\,x^3}-\frac{16\,b^4\,f^a\,f^{b\,x^2}\,{\ln\left(f\right)}^4}{945\,x}-\frac{2\,b\,f^a\,f^{b\,x^2}\,\ln\left(f\right)}{63\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)/x^10,x)
```

```
[Out] (16*f^a*pi^(1/2)*erfc((-b*x^2*log(f))^(1/2))*(-b*x^2*log(f))^(9/2))/(945*x^
9) - (16*f^a*pi^(1/2)*(-b*x^2*log(f))^(9/2))/(945*x^9) - (f^a*f^(b*x^2))/(9
*x^9) - (4*b^2*f^a*f^(b*x^2)*log(f)^2)/(315*x^5) - (8*b^3*f^a*f^(b*x^2)*log
(f)^3)/(945*x^3) - (16*b^4*f^a*f^(b*x^2)*log(f)^4)/(945*x) - (2*b*f^a*f^(b*
x^2)*log(f))/(63*x^7)
```

3.94 $\int \frac{f^{a+bx^2}}{x^{12}}\,dx$

Optimal. Leaf size=34

$$-\frac{f^a\Gamma\left(-\frac{11}{2},-bx^2\log(f)\right)\left(-bx^2\log(f)\right)^{11/2}}{2x^{11}}$$

```
[Out] -1/2*f^a*(64/10395*Pi^(1/2)*erfc((-b*x^2*ln(f))^(1/2))-64/10395/(-b*x^2*ln(
f))^(1/2)*exp(b*x^2*ln(f))+32/10395/(-b*x^2*ln(f))^(3/2)*exp(b*x^2*ln(f))-1
6/3465/(-b*x^2*ln(f))^(5/2)*exp(b*x^2*ln(f))+8/693/(-b*x^2*ln(f))^(7/2)*exp
(b*x^2*ln(f))-4/99/(-b*x^2*ln(f))^(9/2)*exp(b*x^2*ln(f))+2/11/(-b*x^2*ln(f)
)^(11/2)*exp(b*x^2*ln(f)))*(-b*x^2*ln(f))^(11/2)/x^11
```

Rubi [A]
time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$-\frac{f^a\left(-bx^2\log(f)\right)^{11/2}\text{Gamma}\left(-\frac{11}{2},-bx^2\log(f)\right)}{2x^{11}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)/x^12,x]
```

```
[Out] -1/2*(f^a*Gamma[-11/2, -(b*x^2*Log[f])]*(-(b*x^2*Log[f]))^(11/2))/x^11
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^2}}{x^{12}}\,dx = -\frac{f^a\Gamma\left(-\frac{11}{2},-bx^2\log(f)\right)\left(-bx^2\log(f)\right)^{11/2}}{2x^{11}}$$

Mathematica [A]
time = 0.05, size = 34, normalized size = 1.00

$$-\frac{f^a\Gamma\left(-\frac{11}{2},-bx^2\log(f)\right)\left(-bx^2\log(f)\right)^{11/2}}{2x^{11}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)/x^12,x]
```

```
[Out] -1/2*(f^a*Gamma[-11/2, -(b*x^2*Log[f])]*(-(b*x^2*Log[f]))^(11/2))/x^11
```

Maple [A]
time = 0.06, size = 122, normalized size = 3.59

method	result
meijerg	$\frac{f^{a} b^{6} \ln(f)^{\frac{11}{2}} \left(-\frac{2\left(\frac{32 b^{5} x^{10} \ln(f)^{5}}{945}+\frac{16 b^{4} x^{8} \ln(f)^{4}}{945}+\frac{8 b^{3} x^{6} \ln(f)^{3}}{315}+\frac{4 b^{2} x^{4} \ln(f)^{2}}{63}+\frac{2 b\, x^{2} \ln(f)}{9}+1\right) e^{b\, x^{2} \ln(f)}}{11 x^{11} (-b)^{\frac{11}{2}} \ln(f)^{\frac{11}{2}}}+\frac{64 b^{\frac{11}{2}} \sqrt{\pi}\, \operatorname{erfi}\left(x \sqrt{b}\, \sqrt{\mathrm{l}\right.}}{10395 (-b)^{\frac{11}{2}}}\right.}{2 \sqrt{-b}}$
risch	$-\frac{f^{a} f^{b\, x^{2}}}{11 x^{11}}-\frac{2 f^{a} \ln(f) b\, f^{b\, x^{2}}}{99 x^{9}}-\frac{4 f^{a} \ln(f)^{2} b^{2} f^{b\, x^{2}}}{693 x^{7}}-\frac{8 f^{a} \ln(f)^{3} b^{3} f^{b\, x^{2}}}{3465 x^{5}}-\frac{16 f^{a} \ln(f)^{4} b^{4} f^{b\, x^{2}}}{10395 x^{3}}-\frac{32 f^{a} \ln(f)^{5} b^{5} f^{b\, x^{2}}}{10395 x}+\frac{32 f}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)/x^12,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*f^a*b^6*ln(f)^(11/2)/(-b)^(1/2)*(-2/11/x^11/(-b)^(11/2)/ln(f)^(11/2)*(3
2/945*b^5*x^10*ln(f)^5+16/945*b^4*x^8*ln(f)^4+8/315*b^3*x^6*ln(f)^3+4/63*b^
2*x^4*ln(f)^2+2/9*b*x^2*ln(f)+1)*exp(b*x^2*ln(f))+64/10395/(-b)^(11/2)*b^(1
1/2)*Pi^(1/2)*erfi(x*b^(1/2)*ln(f)^(1/2)))
```

Maxima [A]
time = 0.32, size = 28, normalized size = 0.82

$$-\frac{\left(-b x^{2} \log\left(f\right)\right)^{\frac{11}{2}} f^{a} \Gamma\left(-\frac{11}{2}, -b x^{2} \log\left(f\right)\right)}{2\, x^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^12,x, algorithm="maxima")
```

```
[Out] -1/2*(-b*x^2*log(f))^(11/2)*f^a*gamma(-11/2, -b*x^2*log(f))/x^11
```

Fricas [A]
time = 0.39, size = 109, normalized size = 3.21

$$-\frac{32 \sqrt{\pi} \sqrt{-b \log\left(f\right)} b^{5} f^{a} x^{11} \operatorname{erf}\left(\sqrt{-b \log\left(f\right)} x\right) \log\left(f\right)^{5} + \left(32 b^{5} x^{10} \log\left(f\right)^{5} + 16 b^{4} x^{8} \log\left(f\right)^{4} + 24 b^{3} x^{6} \log\left(f\right)^{3} + 60 b^{2} x^{4} \log\left(f\right)^{2} + 210 b x^{2} \log\left(f\right) + 945\right) f^{b x^{2} + a}}{10395\, x^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^12,x, algorithm="fricas")
```

```
[Out] -1/10395*(32*sqrt(pi)*sqrt(-b*log(f))*b^5*f^a*x^11*erf(sqrt(-b*log(f))*x)*l
og(f)^5 + (32*b^5*x^10*log(f)^5 + 16*b^4*x^8*log(f)^4 + 24*b^3*x^6*log(f)^3
 + 60*b^2*x^4*log(f)^2 + 210*b*x^2*log(f) + 945)*f^(b*x^2 + a))/x^11
```

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

$$\int \frac{f^{a+bx^2}}{x^{12}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)/x**12,x)
```

```
[Out] Integral(f**(a + b*x**2)/x**12, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^12,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^2 + a)/x^12, x)
```

Mupad [B]
time = 3.63, size = 175, normalized size = 5.15

$$\frac{32\,f^a\,\sqrt{\pi}\,\left(-b\,x^2\,\ln\left(f\right)\right)^{11/2}}{10395\,x^{11}}-\frac{f^a\,f^{b\,x^2}}{11\,x^{11}}-\frac{32\,f^a\,\sqrt{\pi}\,\mathrm{erfc}\left(\sqrt{-b\,x^2\,\ln\left(f\right)}\right)\,\left(-b\,x^2\,\ln\left(f\right)\right)^{11/2}}{10395\,x^{11}}-\frac{4\,b^2\,f^a\,f^{b\,x^2}\ln\left(f\right)^2}{693\,x^7}-\frac{8\,b^3\,f^a\,f^{b\,x^2}\ln\left(f\right)^3}{3465\,x^5}-\frac{16\,b^4\,f^a\,f^{b\,x^2}\ln\left(f\right)^4}{10395\,x^3}-\frac{32\,b^5\,f^a\,f^{b\,x^2}\ln\left(f\right)^5}{10395\,x}-\frac{2\,b\,f^a\,f^{b\,x^2}\,\ln\left(f\right)}{99\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)/x^12,x)
```

```
[Out] (32*f^a*pi^(1/2)*(-b*x^2*log(f))^(11/2))/(10395*x^11) - (f^a*f^(b*x^2))/(11
*x^11) - (32*f^a*pi^(1/2)*erfc((-b*x^2*log(f))^(1/2))*(-b*x^2*log(f))^(11/2
))/(10395*x^11) - (4*b^2*f^a*f^(b*x^2)*log(f)^2)/(693*x^7) - (8*b^3*f^a*f^(
b*x^2)*log(f)^3)/(3465*x^5) - (16*b^4*f^a*f^(b*x^2)*log(f)^4)/(10395*x^3) -
 (32*b^5*f^a*f^(b*x^2)*log(f)^5)/(10395*x) - (2*b*f^a*f^(b*x^2)*log(f))/(99
*x^9)
```

3.95 $\int f^{a+bx^3} x^m \, dx$

Optimal. Leaf size=46

$$-\frac{1}{3}f^a x^{1+m}\Gamma\left(\frac{1+m}{3},-bx^3\log(f)\right)\left(-bx^3\log(f)\right)^{\frac{1}{3}(-1-m)}$$

```
[Out] -1/3*f^a*x^(1+m)*GAMMA(1/3+1/3*m,-b*x^3*ln(f))*(-b*x^3*ln(f))^(-1/3-1/3*m)
```

Rubi [A]
time = 0.02, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$-\frac{1}{3}f^a x^{m+1}\left(-bx^3\log(f)\right)^{\frac{1}{3}(-m-1)}\text{Gamma}\left(\frac{m+1}{3},-bx^3\log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)*x^m,x]
```

```
[Out] -1/3*(f^a*x^(1 + m)*Gamma[(1 + m)/3, -(b*x^3*Log[f])]*(-(b*x^3*Log[f]))^((-
1 - m)/3))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^3}x^m\,dx=-\frac{1}{3}f^a x^{1+m}\Gamma\left(\frac{1+m}{3},-bx^3\log(f)\right)\left(-bx^3\log(f)\right)^{\frac{1}{3}(-1-m)}$$

Mathematica [A]
time = 0.02, size = 46, normalized size = 1.00

$$-\frac{1}{3}f^a x^{1+m}\Gamma\left(\frac{1+m}{3},-bx^3\log(f)\right)\left(-bx^3\log(f)\right)^{\frac{1}{3}(-1-m)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)*x^m,x]
```

[Out] -1/3*(f^a*x^(1 + m)*Gamma[(1 + m)/3, -(b*x^3*Log[f])]*(-(b*x^3*Log[f]))^((-1 - m)/3))

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 139 vs. $2(38) = 76$.
time = 0.03, size = 140, normalized size = 3.04

method	result
meijerg	$\frac{f^{a}(-b)^{-\frac{m}{3}-\frac{1}{3}}\ln(f)^{-\frac{m}{3}-\frac{1}{3}}\left(\frac{3x^{1+m}(-b)^{\frac{1}{3}+\frac{m}{3}}\ln(f)^{\frac{1}{3}+\frac{m}{3}}\left(\frac{1}{3}+\frac{m}{3}\right)\left(-b\,x^{3}\ln(f)\right)^{-\frac{m}{3}-\frac{1}{3}}\Gamma\left(\frac{1}{3}+\frac{m}{3}\right)}{1+m}+\frac{3x^{1+m}(-b)^{\frac{1}{3}+\frac{m}{3}}\ln(f)^{\frac{1}{3}+\frac{m}{3}}\left(-\frac{m}{3}-\frac{1}{3}\right)}{}\right.}{3}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(f^(b*x^3+a)*x^m,x,method=_RETURNVERBOSE)

[Out] 1/3*f^a*(-b)^(-1/3*m-1/3)*ln(f)^(-1/3*m-1/3)*(3/(1+m)*x^(1+m)*(-b)^(1/3+1/3*m)*ln(f)^(1/3+1/3*m)*(1/3+1/3*m)*(-b*x^3*ln(f))^(-1/3*m-1/3)*GAMMA(1/3+1/3*m)+3/(1+m)*x^(1+m)*(-b)^(1/3+1/3*m)*ln(f)^(1/3+1/3*m)*(-1/3*m-1/3)*(-b*x^3*ln(f))^(-1/3*m-1/3)*GAMMA(1/3+1/3*m,-b*x^3*ln(f)))

Maxima [A]
time = 0.07, size = 38, normalized size = 0.83

$$-\frac{1}{3}\left(-bx^{3}\log\left(f\right)\right)^{-\frac{1}{3}m-\frac{1}{3}}f^{a}x^{m+1}\Gamma\left(\frac{1}{3}m+\frac{1}{3},-bx^{3}\log\left(f\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(b*x^3+a)*x^m,x, algorithm="maxima")

[Out] -1/3*(-b*x^3*log(f))^(-1/3*m - 1/3)*f^a*x^(m + 1)*gamma(1/3*m + 1/3, -b*x^3*log(f))

Fricas [A]
time = 0.08, size = 40, normalized size = 0.87

$$\frac{e^{\left(-\frac{1}{3}(m-2)\log(-b\log(f))+a\log(f)\right)}\Gamma\left(\frac{1}{3}m+\frac{1}{3},-bx^{3}\log\left(f\right)\right)}{3\,b\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(b*x^3+a)*x^m,x, algorithm="fricas")

[Out] 1/3*e^(-1/3*(m - 2)*log(-b*log(f)) + a*log(f))*gamma(1/3*m + 1/3, -b*x^3*log(f))/(b*log(f))

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

$$\int f^{a+bx^{3}}x^{m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)*x**m,x)
```

```
[Out] Integral(f**(a + b*x**3)*x**m, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^m,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^3 + a)*x^m, x)
```

Mupad [B]
time = 3.39, size = 56, normalized size = 1.22

$$\frac{f^a\,x^{m+1}\,\mathrm{e}^{\frac{b\,x^3\,\ln(f)}{2}}\,\mathrm{M}_{\frac{1}{3}-\frac{m}{6},\frac{m}{6}+\frac{1}{6}}\left(b\,x^3\,\ln\left(f\right)\right)}{\left(m+1\right)\,\left(b\,x^3\,\ln\left(f\right)\right)^{\frac{m}{6}+\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)*x^m,x)
```

```
[Out] (f^a*x^(m + 1)*exp((b*x^3*log(f))/2)*whittakerM(1/3 - m/6, m/6 + 1/6, b*x^3
*log(f)))/((m + 1)*(b*x^3*log(f))^(m/6 + 2/3))
```

3.96 $\int f^{a+bx^3} x^{17} \, dx$

Optimal. Leaf size=78

$$-\frac{f^{a+bx^3}\left(120-120bx^3\log(f)+60b^2x^6\log^2(f)-20b^3x^9\log^3(f)+5b^4x^{12}\log^4(f)-b^5x^{15}\log^5(f)\right)}{3b^6\log^6(f)}$$

```
[Out] -1/3*f^(b*x^3+a)*(120-120*b*x^3*ln(f)+60*b^2*x^6*ln(f)^2-20*b^3*x^9*ln(f)^3
+5*b^4*x^12*ln(f)^4-b^5*x^15*ln(f)^5)/b^6/ln(f)^6
```

Rubi [A]
time = 0.03, antiderivative size = 78, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = $\{2249\}$

$$-\frac{f^{a+bx^3}\left(-b^5x^{15}\log^5(f)+5b^4x^{12}\log^4(f)-20b^3x^9\log^3(f)+60b^2x^6\log^2(f)-120bx^3\log(f)+120\right)}{3b^6\log^6(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)*x^17,x]
```

```
[Out] -1/3*(f^(a + b*x^3)*(120 - 120*b*x^3*Log[f] + 60*b^2*x^6*Log[f]^2 - 20*b^3*
x^9*Log[f]^3 + 5*b^4*x^12*Log[f]^4 - b^5*x^15*Log[f]^5))/(b^6*Log[f]^6)
```

Rule 2249

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> With[{p = Simplify[(m + 1)/n]}, Simp[(-F^a)*((f/d)^m/(d*n*
((-b)*Log[F])^p))*Simplify[FunctionExpand[Gamma[p, (-b)*(c + d*x)^n*Log[F]]
]], x] /; IGtQ[p, 0]] /; FreeQ[{F, a, b, c, d, e, f, m, n}, x] && EqQ[d*e -
 c*f, 0] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\int f^{a+bx^3} x^{17} \, dx = -\frac{f^a\Gamma(6,-bx^3\log(f))}{3b^6\log^6(f)}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.05, size = 24, normalized size = 0.31

$$-\frac{f^a\Gamma(6,-bx^3\log(f))}{3b^6\log^6(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)*x^17,x]
```

```
[Out] -1/3*(f^a*Gamma[6, -(b*x^3*Log[f])])/(b^6*Log[f]^6)
```

Maple [A]
time = 0.04, size = 76, normalized size = 0.97

method	result
gosper	$\frac{\left(b^{5} x^{15} \ln(f)^{5}-5 b^{4} x^{12} \ln(f)^{4}+20 b^{3} x^{9} \ln(f)^{3}-60 b^{2} x^{6} \ln(f)^{2}+120 b\, x^{3} \ln(f)-120\right) f^{b\, x^{3}+a}}{3 b^{6} \ln(f)^{6}}$
risch	$\frac{\left(b^{5} x^{15} \ln(f)^{5}-5 b^{4} x^{12} \ln(f)^{4}+20 b^{3} x^{9} \ln(f)^{3}-60 b^{2} x^{6} \ln(f)^{2}+120 b\, x^{3} \ln(f)-120\right) f^{b\, x^{3}+a}}{3 b^{6} \ln(f)^{6}}$
meijerg	$\frac{f^{a} \left(120-\frac{\left(-6 b^{5} x^{15} \ln(f)^{5}+30 b^{4} x^{12} \ln(f)^{4}-120 b^{3} x^{9} \ln(f)^{3}+360 b^{2} x^{6} \ln(f)^{2}-720 b\, x^{3} \ln(f)+720\right) e^{b\, x^{3} \ln(f)}}{6}\right)}{3 b^{6} \ln(f)^{6}}$
norman	$-\frac{40\, e^{\left(b\, x^{3}+a\right) \ln(f)}}{b^{6} \ln(f)^{6}}+\frac{40 x^{3} e^{\left(b\, x^{3}+a\right) \ln(f)}}{b^{5} \ln(f)^{5}}+\frac{x^{15} e^{\left(b\, x^{3}+a\right) \ln(f)}}{3 b \ln(f)}-\frac{20 x^{6} e^{\left(b\, x^{3}+a\right) \ln(f)}}{\ln(f)^{4} b^{4}}+\frac{20 x^{9} e^{\left(b\, x^{3}+a\right) \ln(f)}}{3 \ln(f)^{3} b^{3}}-\frac{5 x^{12} e^{\left(b\, x^{3}+\right.}}{3 \ln(f)^{2}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)*x^17,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*(b^5*x^15*ln(f)^5-5*b^4*x^12*ln(f)^4+20*b^3*x^9*ln(f)^3-60*b^2*x^6*ln(f
)^2+120*b*x^3*ln(f)-120)*f^(b*x^3+a)/b^6/ln(f)^6
```

Maxima [A]
time = 0.29, size = 92, normalized size = 1.18

$$\frac{\left(b^{5} f^{a} x^{15} \log\left(f\right)^{5} - 5\, b^{4} f^{a} x^{12} \log\left(f\right)^{4} + 20\, b^{3} f^{a} x^{9} \log\left(f\right)^{3} - 60\, b^{2} f^{a} x^{6} \log\left(f\right)^{2} + 120\, b f^{a} x^{3} \log\left(f\right) - 120\, f^{a}\right) f^{b x^{3}}}{3\, b^{6} \log\left(f\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^17,x, algorithm="maxima")
```

```
[Out] 1/3*(b^5*f^a*x^15*log(f)^5 - 5*b^4*f^a*x^12*log(f)^4 + 20*b^3*f^a*x^9*log(f
)^3 - 60*b^2*f^a*x^6*log(f)^2 + 120*b*f^a*x^3*log(f) - 120*f^a)*f^(b*x^3)/(
b^6*log(f)^6)
```

Fricas [A]
time = 0.38, size = 75, normalized size = 0.96

$$\frac{\left(b^{5} x^{15} \log\left(f\right)^{5} - 5\, b^{4} x^{12} \log\left(f\right)^{4} + 20\, b^{3} x^{9} \log\left(f\right)^{3} - 60\, b^{2} x^{6} \log\left(f\right)^{2} + 120\, b x^{3} \log\left(f\right) - 120\right) f^{b x^{3} + a}}{3\, b^{6} \log\left(f\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^17,x, algorithm="fricas")
```

```
[Out] 1/3*(b^5*x^15*log(f)^5 - 5*b^4*x^12*log(f)^4 + 20*b^3*x^9*log(f)^3 - 60*b^2
*x^6*log(f)^2 + 120*b*x^3*log(f) - 120)*f^(b*x^3 + a)/(b^6*log(f)^6)
```

Sympy [A]
time = 0.06, size = 94, normalized size = 1.21

$$\begin{cases} \frac{f^{a+bx^3}\left(b^5x^{15}\log{(f)}^5-5b^4x^{12}\log{(f)}^4+20b^3x^9\log{(f)}^3-60b^2x^6\log{(f)}^2+120bx^3\log{(f)}-120\right)}{3b^6\log{(f)}^6} & \text{for } b^6\log{(f)}^6 \neq 0 \\ \frac{x^{18}}{18} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)*x**17,x)
```

```
[Out] Piecewise((f**(a + b*x**3)*(b**5*x**15*log(f)**5 - 5*b**4*x**12*log(f)**4 +
 20*b**3*x**9*log(f)**3 - 60*b**2*x**6*log(f)**2 + 120*b*x**3*log(f) - 120)
/(3*b**6*log(f)**6), Ne(b**6*log(f)**6, 0)), (x**18/18, True))
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^17,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:Polynomial exponent overflow. Error:
Bad Argument Value
```

Mupad [B]
time = 3.66, size = 76, normalized size = 0.97

$$-\frac{f^{b\,x^3+a}\,\left(-\frac{b^5\,x^{15}\,\ln(f)^5}{3}+\frac{5\,b^4\,x^{12}\,\ln(f)^4}{3}-\frac{20\,b^3\,x^9\,\ln(f)^3}{3}+20\,b^2\,x^6\,\ln\left(f\right)^2-40\,b\,x^3\,\ln\left(f\right)+40\right)}{b^6\,\ln\left(f\right)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)*x^17,x)
```

```
[Out] -(f^(a + b*x^3)*(20*b^2*x^6*log(f)^2 - (20*b^3*x^9*log(f)^3)/3 + (5*b^4*x^1
2*log(f)^4)/3 - (b^5*x^15*log(f)^5)/3 - 40*b*x^3*log(f) + 40))/(b^6*log(f)^
6)
```

3.97 $\int f^{a+bx^3} x^{14}\, dx$

Optimal. Leaf size=65

$$\frac{f^{a+bx^3}\left(24-24bx^3\log(f)+12b^2x^6\log^2(f)-4b^3x^9\log^3(f)+b^4x^{12}\log^4(f)\right)}{3b^5\log^5(f)}$$

```
[Out] 1/3*f^(b*x^3+a)*(24-24*b*x^3*ln(f)+12*b^2*x^6*ln(f)^2-4*b^3*x^9*ln(f)^3+b^4
*x^12*ln(f)^4)/b^5/ln(f)^5
```

Rubi [A]
time = 0.02, antiderivative size = 65, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2249}

$$\frac{f^{a+bx^3}\left(b^4x^{12}\log^4(f)-4b^3x^9\log^3(f)+12b^2x^6\log^2(f)-24bx^3\log(f)+24\right)}{3b^5\log^5(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)*x^14,x]
```

```
[Out] (f^(a + b*x^3)*(24 - 24*b*x^3*Log[f] + 12*b^2*x^6*Log[f]^2 - 4*b^3*x^9*Log[
f]^3 + b^4*x^12*Log[f]^4))/(3*b^5*Log[f]^5)
```

Rule 2249

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> With[{p = Simplify[(m + 1)/n]}, Simp[(-F^a)*((f/d)^m/(d*n*
((-b)*Log[F])^p))*Simplify[FunctionExpand[Gamma[p, (-b)*(c + d*x)^n*Log[F]]
]], x] /; IGtQ[p, 0]] /; FreeQ[{F, a, b, c, d, e, f, m, n}, x] && EqQ[d*e -
 c*f, 0] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\int f^{a+bx^3}x^{14}\,dx=\frac{f^a\Gamma(5,-bx^3\log(f))}{3b^5\log^5(f)}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.04, size = 24, normalized size = 0.37

$$\frac{f^a\Gamma(5,-bx^3\log(f))}{3b^5\log^5(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)*x^14,x]
[Out] (f^a*Gamma[5, -(b*x^3*Log[f])])/(3*b^5*Log[f]^5)
```

Maple [A]
time = 0.03, size = 64, normalized size = 0.98

method	result	size
gosper	$\frac{f^{b\,x^{3}+a}\left(24-24b\,x^{3}\ln\left(f\right)+12b^{2}x^{6}\ln\left(f\right)^{2}-4b^{3}x^{9}\ln\left(f\right)^{3}+b^{4}x^{12}\ln\left(f\right)^{4}\right)}{3b^{5}\ln\left(f\right)^{5}}$	64
risch	$\frac{f^{b\,x^{3}+a}\left(24-24b\,x^{3}\ln\left(f\right)+12b^{2}x^{6}\ln\left(f\right)^{2}-4b^{3}x^{9}\ln\left(f\right)^{3}+b^{4}x^{12}\ln\left(f\right)^{4}\right)}{3b^{5}\ln\left(f\right)^{5}}$	64
meijerg	$-\frac{f^{a}\left(24-\frac{\left(5b^{4}x^{12}\ln\left(f\right)^{4}-20b^{3}x^{9}\ln\left(f\right)^{3}+60b^{2}x^{6}\ln\left(f\right)^{2}-120b\,x^{3}\ln\left(f\right)+120\right)e^{b\,x^{3}\ln\left(f\right)}}{5}\right)}{3b^{5}\ln\left(f\right)^{5}}$	71
norman	$\frac{8\,e^{\left(b\,x^{3}+a\right)\ln\left(f\right)}}{b^{5}\ln\left(f\right)^{5}}+\frac{x^{12}e^{\left(b\,x^{3}+a\right)\ln\left(f\right)}}{3b\ln\left(f\right)}-\frac{8x^{3}e^{\left(b\,x^{3}+a\right)\ln\left(f\right)}}{\ln\left(f\right)^{4}b^{4}}+\frac{4x^{6}e^{\left(b\,x^{3}+a\right)\ln\left(f\right)}}{\ln\left(f\right)^{3}b^{3}}-\frac{4x^{9}e^{\left(b\,x^{3}+a\right)\ln\left(f\right)}}{3\ln\left(f\right)^{2}b^{2}}$	114

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)*x^14,x,method=_RETURNVERBOSE)
[Out] 1/3*f^(b*x^3+a)*(24-24*b*x^3*ln(f)+12*b^2*x^6*ln(f)^2-4*b^3*x^9*ln(f)^3+b^4
*x^12*ln(f)^4)/b^5/ln(f)^5
```

Maxima [A]
time = 0.29, size = 77, normalized size = 1.18

$$\frac{\left(b^{4}f^{a}x^{12}\log\left(f\right)^{4}-4\,b^{3}f^{a}x^{9}\log\left(f\right)^{3}+12\,b^{2}f^{a}x^{6}\log\left(f\right)^{2}-24\,bf^{a}x^{3}\log\left(f\right)+24\,f^{a}\right)f^{bx^{3}}}{3\,b^{5}\log\left(f\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^14,x, algorithm="maxima")
[Out] 1/3*(b^4*f^a*x^12*log(f)^4 - 4*b^3*f^a*x^9*log(f)^3 + 12*b^2*f^a*x^6*log(f)
^2 - 24*b*f^a*x^3*log(f) + 24*f^a)*f^(b*x^3)/(b^5*log(f)^5)
```

Fricas [A]
time = 0.38, size = 63, normalized size = 0.97

$$\frac{\left(b^{4}x^{12}\log\left(f\right)^{4}-4\,b^{3}x^{9}\log\left(f\right)^{3}+12\,b^{2}x^{6}\log\left(f\right)^{2}-24\,bx^{3}\log\left(f\right)+24\right)f^{bx^{3}+a}}{3\,b^{5}\log\left(f\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^14,x, algorithm="fricas")
```

```
[Out] 1/3*(b^4*x^12*log(f)^4 - 4*b^3*x^9*log(f)^3 + 12*b^2*x^6*log(f)^2 - 24*b*x^
3*log(f) + 24)*f^(b*x^3 + a)/(b^5*log(f)^5)
```

Sympy [A]
time = 0.05, size = 80, normalized size = 1.23

$$\begin{cases} \frac{f^{a+bx^3}\left(b^4x^{12}\log{(f)}^4-4b^3x^9\log{(f)}^3+12b^2x^6\log{(f)}^2-24bx^3\log{(f)}+24\right)}{3b^5\log{(f)}^5} & \text{for}\ b^5\log{(f)}^5\neq 0 \\ \frac{x^{15}}{15} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)*x**14,x)
```

```
[Out] Piecewise((f**(a + b*x**3)*(b**4*x**12*log(f)**4 - 4*b**3*x**9*log(f)**3 +
12*b**2*x**6*log(f)**2 - 24*b*x**3*log(f) + 24)/(3*b**5*log(f)**5), Ne(b**5
*log(f)**5, 0)), (x**15/15, True))
```

Giac [A]
time = 2.44, size = 105, normalized size = 1.62

$$\frac{b^4f^{bx^3}f^ax^{12}\log{(f)}^4-4\,b^3f^{bx^3}f^ax^9\log{(f)}^3+12\,b^2f^{bx^3}f^ax^6\log{(f)}^2-24\,bf^{bx^3}f^ax^3\log{(f)}+24\,f^{bx^3}f^a}{3\,b^5\log{(f)}^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^14,x, algorithm="giac")
```

```
[Out] 1/3*(b^4*f^(b*x^3)*f^a*x^12*log(f)^4 - 4*b^3*f^(b*x^3)*f^a*x^9*log(f)^3 + 1
2*b^2*f^(b*x^3)*f^a*x^6*log(f)^2 - 24*b*f^(b*x^3)*f^a*x^3*log(f) + 24*f^(b*
x^3)*f^a)/(b^5*log(f)^5)
```

Mupad [B]
time = 3.54, size = 63, normalized size = 0.97

$$\frac{f^{b\,x^3+a}\,\left(\frac{b^4\,x^{12}\,\ln(f)^4}{3}-\frac{4\,b^3\,x^9\,\ln(f)^3}{3}+4\,b^2\,x^6\,\ln{(f)}^2-8\,b\,x^3\,\ln{(f)}+8\right)}{b^5\,\ln{(f)}^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)*x^14,x)
```

```
[Out] (f^(a + b*x^3)*(4*b^2*x^6*log(f)^2 - (4*b^3*x^9*log(f)^3)/3 + (b^4*x^12*log
(f)^4)/3 - 8*b*x^3*log(f) + 8))/(b^5*log(f)^5)
```

3.98 $\int f^{a+bx^3}x^{11}\,dx$

Optimal. Leaf size=84

$$-\frac{2f^{a+bx^3}}{b^4\log^4(f)}+\frac{2f^{a+bx^3}x^3}{b^3\log^3(f)}-\frac{f^{a+bx^3}x^6}{b^2\log^2(f)}+\frac{f^{a+bx^3}x^9}{3b\log(f)}$$

```
[Out] -2*f^(b*x^3+a)/b^4/ln(f)^4+2*f^(b*x^3+a)*x^3/b^3/ln(f)^3-f^(b*x^3+a)*x^6/b^
2/ln(f)^2+1/3*f^(b*x^3+a)*x^9/b/ln(f)
```

Rubi [A]

time = 0.07, antiderivative size = 84, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2243, 2240}

$$-\frac{2f^{a+bx^3}}{b^4\log^4(f)}+\frac{2x^3f^{a+bx^3}}{b^3\log^3(f)}-\frac{x^6f^{a+bx^3}}{b^2\log^2(f)}+\frac{x^9f^{a+bx^3}}{3b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)*x^11,x]
```

```
[Out] (-2*f^(a + b*x^3))/(b^4*Log[f]^4) + (2*f^(a + b*x^3)*x^3)/(b^3*Log[f]^3) -
(f^(a + b*x^3)*x^6)/(b^2*Log[f]^2) + (f^(a + b*x^3)*x^9)/(3*b*Log[f])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int f^{a+bx^3}x^{11}\,dx = \frac{f^{a+bx^3}x^9}{3b\log(f)} - \frac{3\int f^{a+bx^3}x^8\,dx}{b\log(f)}$$
$$= -\frac{f^{a+bx^3}x^6}{b^2\log^2(f)} + \frac{f^{a+bx^3}x^9}{3b\log(f)} + \frac{6\int f^{a+bx^3}x^5\,dx}{b^2\log^2(f)}$$
$$= \frac{2f^{a+bx^3}x^3}{b^3\log^3(f)} - \frac{f^{a+bx^3}x^6}{b^2\log^2(f)} + \frac{f^{a+bx^3}x^9}{3b\log(f)} - \frac{6\int f^{a+bx^3}x^2\,dx}{b^3\log^3(f)}$$
$$= -\frac{2f^{a+bx^3}}{b^4\log^4(f)} + \frac{2f^{a+bx^3}x^3}{b^3\log^3(f)} - \frac{f^{a+bx^3}x^6}{b^2\log^2(f)} + \frac{f^{a+bx^3}x^9}{3b\log(f)}$$

Mathematica [A]
time = 0.04, size = 53, normalized size = 0.63

$$\frac{f^{a+bx^3}\left(-6+6bx^3\log(f)-3b^2x^6\log^2(f)+b^3x^9\log^3(f)\right)}{3b^4\log^4(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)*x^11,x]
[Out] (f^(a + b*x^3)*(-6 + 6*b*x^3*Log[f] - 3*b^2*x^6*Log[f]^2 + b^3*x^9*Log[f]^3
))/(3*b^4*Log[f]^4)
```

Maple [A]
time = 0.02, size = 52, normalized size = 0.62

method	result	size
gosper	$\frac{\left(b^3x^9\ln(f)^3-3b^2x^6\ln(f)^2+6b\,x^3\ln(f)-6\right)f^{b\,x^3+a}}{3\ln(f)^4b^4}$	52
risch	$\frac{\left(b^3x^9\ln(f)^3-3b^2x^6\ln(f)^2+6b\,x^3\ln(f)-6\right)f^{b\,x^3+a}}{3\ln(f)^4b^4}$	52
meijerg	$\frac{f^a\left(6-\frac{\left(-4b^3x^9\ln(f)^3+12b^2x^6\ln(f)^2-24b\,x^3\ln(f)+24\right)e^{b\,x^3\ln(f)}}{4}\right)}{3b^4\ln(f)^4}$	59
norman	$-\frac{2\,e^{\left(b\,x^3+a\right)\ln(f)}}{\ln(f)^4b^4}+\frac{x^9e^{\left(b\,x^3+a\right)\ln(f)}}{3\ln(f)b}+\frac{2x^3e^{\left(b\,x^3+a\right)\ln(f)}}{\ln(f)^3b^3}-\frac{x^6e^{\left(b\,x^3+a\right)\ln(f)}}{\ln(f)^2b^2}$	91

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)*x^11,x,method=_RETURNVERBOSE)
[Out] 1/3*(b^3*x^9*ln(f)^3-3*b^2*x^6*ln(f)^2+6*b*x^3*ln(f)-6)*f^(b*x^3+a)/ln(f)^4
/b^4
```

Maxima [A]
time = 0.29, size = 62, normalized size = 0.74

$$\frac{\left(b^{3} f^{a} x^{9} \log \left(f\right)^{3}-3 \, b^{2} f^{a} x^{6} \log \left(f\right)^{2}+6 \, b f^{a} x^{3} \log \left(f\right)-6 \, f^{a}\right) f^{b x^{3}}}{3 \, b^{4} \log \left(f\right)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^11,x, algorithm="maxima")
```

```
[Out] 1/3*(b^3*f^a*x^9*log(f)^3 - 3*b^2*f^a*x^6*log(f)^2 + 6*b*f^a*x^3*log(f) - 6
*f^a)*f^(b*x^3)/(b^4*log(f)^4)
```

Fricas [A]
time = 0.39, size = 51, normalized size = 0.61

$$\frac{\left(b^{3} x^{9} \log \left(f\right)^{3}-3 \, b^{2} x^{6} \log \left(f\right)^{2}+6 \, b x^{3} \log \left(f\right)-6\right) f^{b x^{3}+a}}{3 \, b^{4} \log \left(f\right)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^11,x, algorithm="fricas")
```

```
[Out] 1/3*(b^3*x^9*log(f)^3 - 3*b^2*x^6*log(f)^2 + 6*b*x^3*log(f) - 6)*f^(b*x^3 +
 a)/(b^4*log(f)^4)
```

Sympy [A]
time = 0.06, size = 66, normalized size = 0.79

$$\begin{cases} \frac{f^{a+bx^{3}} \left(b^{3} x^{9} \log \left(f\right)^{3}-3 b^{2} x^{6} \log \left(f\right)^{2}+6 b x^{3} \log \left(f\right)-6\right)}{3 b^{4} \log \left(f\right)^{4}} & \text{for}\: b^{4} \log \left(f\right)^{4} \neq 0 \\ \frac{x^{12}}{12} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)*x**11,x)
```

```
[Out] Piecewise((f**(a + b*x**3)*(b**3*x**9*log(f)**3 - 3*b**2*x**6*log(f)**2 + 6
*b*x**3*log(f) - 6)/(3*b**4*log(f)**4), Ne(b**4*log(f)**4, 0)), (x**12/12,
True))
```

Giac [A]
time = 3.90, size = 83, normalized size = 0.99

$$\frac{b^{3} f^{b x^{3}} f^{a} x^{9} \log \left(f\right)^{3}-3 \, b^{2} f^{b x^{3}} f^{a} x^{6} \log \left(f\right)^{2}+6 \, b f^{b x^{3}} f^{a} x^{3} \log \left(f\right)-6 \, f^{b x^{3}} f^{a}}{3 \, b^{4} \log \left(f\right)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^11,x, algorithm="giac")
```

```
[Out] 1/3*(b^3*f^(b*x^3)*f^a*x^9*log(f)^3 - 3*b^2*f^(b*x^3)*f^a*x^6*log(f)^2 + 6*
b*f^(b*x^3)*f^a*x^3*log(f) - 6*f^(b*x^3)*f^a)/(b^4*log(f)^4)
```

Mupad [B]
time = 3.46, size = 51, normalized size = 0.61

$$-\frac{f^{b\,x^3+a}\,\left(-\frac{b^3\,x^9\,\ln(f)^3}{3}+b^2\,x^6\,\ln\left(f\right)^2-2\,b\,x^3\,\ln\left(f\right)+2\right)}{b^4\,\ln\left(f\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)*x^11,x)
```

```
[Out] -(f^(a + b*x^3)*(b^2*x^6*log(f)^2 - (b^3*x^9*log(f)^3)/3 - 2*b*x^3*log(f) +
 2))/(b^4*log(f)^4)
```

3.99 $\int f^{a+bx^3} x^8 \, dx$

Optimal. Leaf size=67

$$\frac{2f^{a+bx^3}}{3b^3\log^3(f)}-\frac{2f^{a+bx^3}x^3}{3b^2\log^2(f)}+\frac{f^{a+bx^3}x^6}{3b\log(f)}$$

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

Rubi [A]
time = 0.05, antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2243, 2240}

$$\frac{2f^{a+bx^3}}{3b^3\log^3(f)}-\frac{2x^3f^{a+bx^3}}{3b^2\log^2(f)}+\frac{x^6f^{a+bx^3}}{3b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)*x^8,x]
```

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

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int f^{a+bx^3}x^8\,dx = \frac{f^{a+bx^3}x^6}{3b\log(f)} - \frac{2\int f^{a+bx^3}x^5\,dx}{b\log(f)}$$
$$= -\frac{2f^{a+bx^3}x^3}{3b^2\log^2(f)} + \frac{f^{a+bx^3}x^6}{3b\log(f)} + \frac{2\int f^{a+bx^3}x^2\,dx}{b^2\log^2(f)}$$
$$= \frac{2f^{a+bx^3}}{3b^3\log^3(f)} - \frac{2f^{a+bx^3}x^3}{3b^2\log^2(f)} + \frac{f^{a+bx^3}x^6}{3b\log(f)}$$

Mathematica [A]
time = 0.03, size = 41, normalized size = 0.61

$$\frac{f^{a+bx^3}\left(2-2bx^3\log(f)+b^2x^6\log^2(f)\right)}{3b^3\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)*x^8,x]
[Out] (f^(a + b*x^3)*(2 - 2*b*x^3*Log[f] + b^2*x^6*Log[f]^2))/(3*b^3*Log[f]^3)
```

Maple [A]
time = 0.02, size = 40, normalized size = 0.60

method	result	size
gosper	$\frac{\left(b^2x^6\ln(f)^2-2bx^3\ln(f)+2\right)f^{bx^3+a}}{3\ln(f)^3b^3}$	40
risch	$\frac{\left(b^2x^6\ln(f)^2-2bx^3\ln(f)+2\right)f^{bx^3+a}}{3\ln(f)^3b^3}$	40
meijerg	$-\frac{f^a\left(2-\frac{\left(3b^2x^6\ln(f)^2-6bx^3\ln(f)+6\right)e^{bx^3\ln(f)}}{3}\right)}{3b^3\ln(f)^3}$	47
norman	$\frac{2\,e^{\left(bx^3+a\right)\ln(f)}}{3\ln(f)^3b^3}+\frac{x^6e^{\left(bx^3+a\right)\ln(f)}}{3b\ln(f)}-\frac{2x^3e^{\left(bx^3+a\right)\ln(f)}}{3\ln(f)^2b^2}$	68

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)*x^8,x,method=_RETURNVERBOSE)
[Out] 1/3*(b^2*x^6*ln(f)^2-2*b*x^3*ln(f)+2)*f^(b*x^3+a)/ln(f)^3/b^3
```

Maxima [A]
time = 0.28, size = 47, normalized size = 0.70

$$\frac{\left(b^2f^ax^6\log(f)^2-2\,bf^ax^3\log(f)+2\,f^a\right)f^{bx^3}}{3\,b^3\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^8,x, algorithm="maxima")
```

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

Fricas [A]
time = 0.41, size = 39, normalized size = 0.58

$$\frac{\left(b^2x^6\log\left(f\right)^2-2\,bx^3\log\left(f\right)+2\right)f^{bx^3+a}}{3\,b^3\log\left(f\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^8,x, algorithm="fricas")
```

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

Sympy [A]
time = 0.05, size = 53, normalized size = 0.79

$$\begin{cases}\frac{f^{a+bx^3}\left(b^2x^6\log\left(f\right)^2-2bx^3\log\left(f\right)+2\right)}{3b^3\log\left(f\right)^3} & \text{for } b^3\log\left(f\right)^3\neq 0\\ \frac{x^9}{9} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)*x**8,x)
```

```
[Out] Piecewise((f**(a + b*x**3)*(b**2*x**6*log(f)**2 - 2*b*x**3*log(f) + 2)/(3*b
**3*log(f)**3), Ne(b**3*log(f)**3, 0)), (x**9/9, True))
```

Giac [A]
time = 2.25, size = 61, normalized size = 0.91

$$\frac{b^2f^{bx^3}f^ax^6\log\left(f\right)^2-2\,bf^{bx^3}f^ax^3\log\left(f\right)+2\,f^{bx^3}f^a}{3\,b^3\log\left(f\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^8,x, algorithm="giac")
```

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

Mupad [B]
time = 3.47, size = 39, normalized size = 0.58

$$\frac{f^{b\,x^3+a}\,\left(\frac{b^2\,x^6\,\ln(f)^2}{3}-\frac{2\,b\,x^3\,\ln(f)}{3}+\frac{2}{3}\right)}{b^3\,\ln\left(f\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)*x^8,x)
```

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

3.100 $\int f^{a+bx^3} x^5\, dx$

Optimal. Leaf size=44

$$-\frac{f^{a+bx^3}}{3b^2\log^2(f)}+\frac{f^{a+bx^3}x^3}{3b\log(f)}$$

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

Rubi [A]

time = 0.03, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2243, 2240}

$$\frac{x^3 f^{a+bx^3}}{3b\log(f)}-\frac{f^{a+bx^3}}{3b^2\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)*x^5,x]
```

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

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\begin{aligned}\int f^{a+bx^3} x^5\, dx &= \frac{f^{a+bx^3}x^3}{3b\log(f)}-\frac{\int f^{a+bx^3}x^2\, dx}{b\log(f)}\\ &= -\frac{f^{a+bx^3}}{3b^2\log^2(f)}+\frac{f^{a+bx^3}x^3}{3b\log(f)}\end{aligned}$$

Mathematica [A]
time = 0.03, size = 29, normalized size = 0.66

$$\frac{f^{a+bx^3}\left(-1+bx^3\log(f)\right)}{3b^2\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)*x^5,x]
[Out] (f^(a + b*x^3)*(-1 + b*x^3*Log[f]))/(3*b^2*Log[f]^2)
```

Maple [A]
time = 0.01, size = 28, normalized size = 0.64

method	result	size
gosper	$\frac{\left(b\,x^3\ln(f)-1\right)f^{b\,x^3+a}}{3\ln(f)^2b^2}$	28
risch	$\frac{\left(b\,x^3\ln(f)-1\right)f^{b\,x^3+a}}{3\ln(f)^2b^2}$	28
meijerg	$\frac{f^a\left(1-\frac{\left(2-2b\,x^3\ln(f)\right)e^{b\,x^3\ln(f)}}{2}\right)}{3b^2\ln(f)^2}$	35
norman	$-\frac{e^{\left(b\,x^3+a\right)\ln(f)}}{3\ln(f)^2b^2}+\frac{x^3e^{\left(b\,x^3+a\right)\ln(f)}}{3\ln(f)b}$	45

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)*x^5,x,method=_RETURNVERBOSE)
[Out] 1/3*(b*x^3*ln(f)-1)*f^(b*x^3+a)/ln(f)^2/b^2
```

Maxima [A]
time = 0.28, size = 32, normalized size = 0.73

$$\frac{\left(bf^ax^3\log\left(f\right)-f^a\right)f^{bx^3}}{3\,b^2\log\left(f\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^5,x, algorithm="maxima")
[Out] 1/3*(b*f^a*x^3*log(f) - f^a)*f^(b*x^3)/(b^2*log(f)^2)
```

Fricas [A]
time = 0.41, size = 27, normalized size = 0.61

$$\frac{\left(bx^3\log\left(f\right)-1\right)f^{bx^3+a}}{3\,b^2\log\left(f\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^5,x, algorithm="fricas")
```

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

Sympy [A]
time = 0.04, size = 39, normalized size = 0.89

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)*x**5,x)
```

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

Giac [C] Result contains complex when optimal does not.
time = 2.50, size = 689, normalized size = 15.66

$$\frac{1}{3}\left(2\left(\frac{(bx^3\log(|f|)-1)(\pi^2b^2\operatorname{sgn}(f)-\pi^2b^2+2b^2\log(|f|)^2)}{(\pi^2b^2\operatorname{sgn}(f)-\pi^2b^2+2b^2\log(|f|)^2)^2+4(\pi b^2\log(|f|)\operatorname{sgn}(f)-\pi b^2\log(|f|))^2}+\frac{(\pi bx^3\operatorname{sgn}(f)-\pi bx^3)(\pi b^2\log(|f|)\operatorname{sgn}(f)-\pi b^2\log(|f|))}{(\pi^2b^2\operatorname{sgn}(f)-\pi^2b^2+2b^2\log(|f|)^2)^2+4(\pi b^2\log(|f|)\operatorname{sgn}(f)-\pi b^2\log(|f|))^2}\right)\cos\left(-\frac{1}{2}\pi bx^3\operatorname{sgn}(f)+\frac{1}{2}\pi bx^3-\frac{1}{2}\pi a\operatorname{sgn}(f)+\frac{1}{2}\pi a\right)+\left(\frac{(\pi bx^3\operatorname{sgn}(f)-\pi bx^3)(\pi^2b^2\operatorname{sgn}(f)-\pi^2b^2+2b^2\log(|f|)^2)}{(\pi^2b^2\operatorname{sgn}(f)-\pi^2b^2+2b^2\log(|f|)^2)^2+4(\pi b^2\log(|f|)\operatorname{sgn}(f)-\pi b^2\log(|f|))^2}-\frac{4(bx^3\log(|f|)-1)(\pi b^2\log(|f|)\operatorname{sgn}(f)-\pi b^2\log(|f|))}{(\pi^2b^2\operatorname{sgn}(f)-\pi^2b^2+2b^2\log(|f|)^2)^2+4(\pi b^2\log(|f|)\operatorname{sgn}(f)-\pi b^2\log(|f|))^2}\right)\sin\left(-\frac{1}{2}\pi bx^3\operatorname{sgn}(f)+\frac{1}{2}\pi bx^3-\frac{1}{2}\pi a\operatorname{sgn}(f)+\frac{1}{2}\pi a\right)\right)e^{(bx^3\log(|f|)+a\log(|f|))}-\frac{1}{6}i\left(\frac{(\pi bx^3\operatorname{sgn}(f)-\pi bx^3-2i\,bx^3\log(|f|)+2i)e^{(\frac{1}{2}i\,\pi bx^3\operatorname{sgn}(f)-\frac{1}{2}i\,\pi bx^3+\frac{1}{2}i\,\pi a\operatorname{sgn}(f)-\frac{1}{2}i\,\pi a)}}{\pi^2b^2\operatorname{sgn}(f)+2i\,\pi b^2\log(|f|)\operatorname{sgn}(f)-\pi^2b^2-2i\,\pi b^2\log(|f|)+2b^2\log(|f|)^2}+\frac{(\pi bx^3\operatorname{sgn}(f)-\pi bx^3+2i\,bx^3\log(|f|)-2i)e^{(-\frac{1}{2}i\,\pi bx^3\operatorname{sgn}(f)+\frac{1}{2}i\,\pi bx^3-\frac{1}{2}i\,\pi a\operatorname{sgn}(f)+\frac{1}{2}i\,\pi a)}}{\pi^2b^2\operatorname{sgn}(f)-2i\,\pi b^2\log(|f|)\operatorname{sgn}(f)-\pi^2b^2+2i\,\pi b^2\log(|f|)+2b^2\log(|f|)^2}\right)e^{(bx^3\log(|f|)+a\log(|f|))}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^5,x, algorithm="giac")
```

```
[Out] 1/3*(2*((b*x^3*log(abs(f)) - 1)*(pi^2*b^2*sgn(f) - pi^2*b^2 + 2*b^2*log(abs
(f))^2)/((pi^2*b^2*sgn(f) - pi^2*b^2 + 2*b^2*log(abs(f))^2)^2 + 4*(pi*b^2*l
og(abs(f))*sgn(f) - pi*b^2*log(abs(f)))^2) + (pi*b*x^3*sgn(f) - pi*b*x^3)*(
pi*b^2*log(abs(f))*sgn(f) - pi*b^2*log(abs(f)))/((pi^2*b^2*sgn(f) - pi^2*b^
2 + 2*b^2*log(abs(f))^2)^2 + 4*(pi*b^2*log(abs(f))*sgn(f) - pi*b^2*log(abs(
f)))^2))*cos(-1/2*pi*b*x^3*sgn(f) + 1/2*pi*b*x^3 - 1/2*pi*a*sgn(f) + 1/2*pi
*a) + ((pi*b*x^3*sgn(f) - pi*b*x^3)*(pi^2*b^2*sgn(f) - pi^2*b^2 + 2*b^2*log
(abs(f))^2)/((pi^2*b^2*sgn(f) - pi^2*b^2 + 2*b^2*log(abs(f))^2)^2 + 4*(pi*b
^2*log(abs(f))*sgn(f) - pi*b^2*log(abs(f)))^2) - 4*(b*x^3*log(abs(f)) - 1)*
(pi*b^2*log(abs(f))*sgn(f) - pi*b^2*log(abs(f)))/((pi^2*b^2*sgn(f) - pi^2*b
^2 + 2*b^2*log(abs(f))^2)^2 + 4*(pi*b^2*log(abs(f))*sgn(f) - pi*b^2*log(abs
(f)))^2))*sin(-1/2*pi*b*x^3*sgn(f) + 1/2*pi*b*x^3 - 1/2*pi*a*sgn(f) + 1/2*p
i*a))*e^(b*x^3*log(abs(f)) + a*log(abs(f))) - 1/6*I*((pi*b*x^3*sgn(f) - pi*
b*x^3 - 2*I*b*x^3*log(abs(f)) + 2*I)*e^(1/2*I*pi*b*x^3*sgn(f) - 1/2*I*pi*b*
x^3 + 1/2*I*pi*a*sgn(f) - 1/2*I*pi*a)/(pi^2*b^2*sgn(f) + 2*I*pi*b^2*log(abs
(f))*sgn(f) - pi^2*b^2 - 2*I*pi*b^2*log(abs(f)) + 2*b^2*log(abs(f))^2) + (p
i*b*x^3*sgn(f) - pi*b*x^3 + 2*I*b*x^3*log(abs(f)) - 2*I)*e^(-1/2*I*pi*b*x^3
*sgn(f) + 1/2*I*pi*b*x^3 - 1/2*I*pi*a*sgn(f) + 1/2*I*pi*a)/(pi^2*b^2*sgn(f)
 - 2*I*pi*b^2*log(abs(f))*sgn(f) - pi^2*b^2 + 2*I*pi*b^2*log(abs(f)) + 2*b^
2*log(abs(f))^2))*e^(b*x^3*log(abs(f)) + a*log(abs(f)))
```

Mupad [B]
time = 3.25, size = 27, normalized size = 0.61

$$\frac{f^{b\,x^3+a}\,\left(\frac{b\,x^3\,\ln(f)}{3}-\frac{1}{3}\right)}{b^2\,\ln\left(f\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)*x^5,x)
[Out] (f^(a + b*x^3)*((b*x^3*log(f))/3 - 1/3))/(b^2*log(f)^2)
```

3.101 $\int f^{a+bx^3} x^2 \, dx$

Optimal. Leaf size=20

$$\frac{f^{a+bx^3}}{3b\log(f)}$$

[Out] 1/3*f^(b*x^3+a)/b/ln(f)

Rubi [A]
time = 0.01, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2240}

$$\frac{f^{a+bx^3}}{3b\log(f)}$$

Antiderivative was successfully verified.

[In] Int[f^(a + b*x^3)*x^2,x]

[Out] f^(a + b*x^3)/(3*b*Log[f])

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^3} x^2 \, dx = \frac{f^{a+bx^3}}{3b\log(f)}$$

Mathematica [A]
time = 0.01, size = 20, normalized size = 1.00

$$\frac{f^{a+bx^3}}{3b\log(f)}$$

Antiderivative was successfully verified.

[In] Integrate[f^(a + b*x^3)*x^2,x]

[Out] f^(a + b*x^3)/(3*b*Log[f])

Maple [A]
time = 0.01, size = 19, normalized size = 0.95

method	result	size
gosper	$\frac{f^{b\,x^3+a}}{3b\ln(f)}$	19
derivativedivides	$\frac{f^{b\,x^3+a}}{3b\ln(f)}$	19
default	$\frac{f^{b\,x^3+a}}{3b\ln(f)}$	19
risch	$\frac{f^{b\,x^3+a}}{3b\ln(f)}$	19
norman	$\frac{e^{\left(b\,x^3+a\right)\ln(f)}}{3b\ln(f)}$	21
meijerg	$-\frac{f^a\left(1-e^{b\,x^3\ln(f)}\right)}{3b\ln(f)}$	25

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)*x^2,x,method=_RETURNVERBOSE)
[Out] 1/3*f^(b*x^3+a)/b/ln(f)
```

Maxima [A]
time = 0.28, size = 18, normalized size = 0.90

$$\frac{f^{bx^3+a}}{3\,b\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^2,x, algorithm="maxima")
[Out] 1/3*f^(b*x^3 + a)/(b*log(f))
```

Fricas [A]
time = 0.39, size = 18, normalized size = 0.90

$$\frac{f^{bx^3+a}}{3\,b\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^2,x, algorithm="fricas")
[Out] 1/3*f^(b*x^3 + a)/(b*log(f))
```

Sympy [A]
time = 0.03, size = 22, normalized size = 1.10

$$\begin{cases} \frac{f^{a+bx^3}}{3b\log(f)} & \text{for } b\log(f) \neq 0 \\ \frac{x^3}{3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)*x**2,x)
[Out] Piecewise((f**(a + b*x**3)/(3*b*log(f)), Ne(b*log(f), 0)), (x**3/3, True))
```

Giac [A]
time = 2.49, size = 18, normalized size = 0.90

$$\frac{f^{bx^3+a}}{3\,b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^2,x, algorithm="giac")
[Out] 1/3*f^(b*x^3 + a)/(b*log(f))
```

Mupad [B]
time = 3.47, size = 18, normalized size = 0.90

$$\frac{f^{b\,x^3+a}}{3\,b\,\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)*x^2,x)
[Out] f^(a + b*x^3)/(3*b*log(f))
```

3.102 $\int \frac{f^{a+bx^3}}{x} dx$

Optimal. Leaf size=15

$$\frac{1}{3}f^a\text{Ei}\left(bx^3\log(f)\right)$$

```
[Out] 1/3*f^a*Ei(b*x^3*ln(f))
```

Rubi [A]
time = 0.02, antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2241}

$$\frac{1}{3}f^a\text{Ei}\left(bx^3\log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)/x,x]
```

```
[Out] (f^a*ExpIntegralEi[b*x^3*Log[f]])/3
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^3}}{x} dx = \frac{1}{3}f^a\text{Ei}\left(bx^3\log(f)\right)$$

Mathematica [A]
time = 0.02, size = 15, normalized size = 1.00

$$\frac{1}{3}f^a\text{Ei}\left(bx^3\log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)/x,x]
```

```
[Out] (f^a*ExpIntegralEi[b*x^3*Log[f]])/3
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 40 vs. $2(13) = 26$.
time = 0.02, size = 41, normalized size = 2.73

method	result	size
meijerg	$\frac{f^{a}\left(-\ln \left(-b\,x^{3} \ln \left(f \right)\right)-\operatorname{expIntegral}\left(1,-b\,x^{3} \ln \left(f \right)\right)+3 \ln \left(x \right)+\ln \left(-b \right)+\ln \left(\ln \left(f \right)\right)\right)}{3}$	41

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)/x,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*f^a*(-ln(-b*x^3*ln(f))-Ei(1,-b*x^3*ln(f))+3*ln(x)+ln(-b)+ln(ln(f)))
```

Maxima [A]
time = 0.32, size = 13, normalized size = 0.87

$$\frac{1}{3}\,f^{a}{\rm Ei}\left(bx^{3}\log\left(f\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*f^a*Ei(b*x^3*log(f))
```

Fricas [A]
time = 0.41, size = 13, normalized size = 0.87

$$\frac{1}{3}\,f^{a}{\rm Ei}\left(bx^{3}\log\left(f\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*f^a*Ei(b*x^3*log(f))
```

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

$$\int\frac{f^{a+bx^{3}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)/x,x)
```

```
[Out] Integral(f**(a + b*x**3)/x, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^(b*x^3 + a)/x, x)
```

Mupad [B]
time = 3.24, size = 13, normalized size = 0.87

$$\frac{f^a\,\mathrm{ei}(b\,x^3\,\ln\left(f\right))}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)/x,x)
```

```
[Out] (f^a*ei(b*x^3*log(f)))/3
```

3.103 $\int \frac{f^{a+bx^3}}{x^4} dx$

Optimal. Leaf size=35

$$-\frac{f^{a+bx^3}}{3x^3}+\frac{1}{3}bf^a\text{Ei}\left(bx^3\log(f)\right)\log(f)$$

```
[Out] -1/3*f^(b*x^3+a)/x^3+1/3*b*f^a*Ei(b*x^3*ln(f))*ln(f)
```

Rubi [A]
time = 0.03, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2245, 2241}

$$\frac{1}{3}bf^a\log(f)\text{Ei}\left(bx^3\log(f)\right)-\frac{f^{a+bx^3}}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)/x^4,x]
```

```
[Out] -1/3*f^(a + b*x^3)/x^3 + (b*f^a*ExpIntegralEi[b*x^3*Log[f]]*Log[f])/3
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int \frac{f^{a+bx^3}}{x^4} dx &= -\frac{f^{a+bx^3}}{3x^3}+(b\log(f))\int \frac{f^{a+bx^3}}{x} dx\\ &= -\frac{f^{a+bx^3}}{3x^3}+\frac{1}{3}bf^a\text{Ei}\left(bx^3\log(f)\right)\log(f)\end{aligned}$$

Mathematica [A]
time = 0.03, size = 32, normalized size = 0.91

$$\frac{1}{3}f^a\left(-\frac{f^{bx^3}}{x^3}+b\text{Ei}\left(bx^3\log(f)\right)\log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)/x^4,x]
```

```
[Out] (f^a*(-(f^(b*x^3)/x^3) + b*ExpIntegralEi[b*x^3*Log[f]]*Log[f]))/3
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 96 vs. 2(31) = 62.
time = 0.02, size = 97, normalized size = 2.77

method	result
meijerg	$-\frac{f^a b\ln(f)\left(-\frac{2+2b x^3\ln(f)}{2b x^3\ln(f)}+\frac{e^{b x^3\ln(f)}}{x^3\ln(f)b}+\ln\left(-b x^3\ln(f)\right)+\text{expIntegral}\left(1,-b x^3\ln(f)\right)+1-3\ln(x)-\ln(-b)-\ln(\ln(f))+\frac{1}{x^3\ln(f)b}\right)}{3}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*f^a*b*ln(f)*(-1/2/b/x^3/ln(f)*(2+2*b*x^3*ln(f))+1/x^3/ln(f)/b*exp(b*x^
3*ln(f))+ln(-b*x^3*ln(f))+Ei(1,-b*x^3*ln(f))+1-3*ln(x)-ln(-b)-ln(ln(f))+1/x
^3/ln(f)/b)
```

Maxima [A]
time = 0.32, size = 18, normalized size = 0.51

$$\frac{1}{3}\,bf^a\Gamma\left(-1,-bx^3\log\left(f\right)\right)\log\left(f\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^4,x, algorithm="maxima")
```

```
[Out] 1/3*b*f^a*gamma(-1, -b*x^3*log(f))*log(f)
```

Fricas [A]
time = 0.36, size = 35, normalized size = 1.00

$$\frac{bf^ax^3\text{Ei}\left(bx^3\log\left(f\right)\right)\log\left(f\right)-f^{bx^3+a}}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^4,x, algorithm="fricas")
```

```
[Out] 1/3*(b*f^a*x^3*Ei(b*x^3*log(f))*log(f) - f^(b*x^3 + a))/x^3
```

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

$$\int \frac{f^{a+bx^3}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)/x**4,x)
```

```
[Out] Integral(f**(a + b*x**3)/x**4, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^4,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^3 + a)/x^4, x)
```

Mupad [B]
time = 3.53, size = 32, normalized size = 0.91

$$-\frac{f^a\,\left(f^{b\,x^3}+b\,x^3\,\ln\left(f\right)\,\mathrm{expint}\left(-b\,x^3\,\ln\left(f\right)\right)\right)}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)/x^4,x)
```

```
[Out] -(f^a*(f^(b*x^3) + b*x^3*log(f)*expint(-b*x^3*log(f))))/(3*x^3)
```

3.104 $\int \frac{f^{a+bx^3}}{x^7}\,dx$

Optimal. Leaf size=58

$$-\frac{f^{a+bx^3}}{6x^6}-\frac{bf^{a+bx^3}\log(f)}{6x^3}+\frac{1}{6}b^2f^a\text{Ei}\left(bx^3\log(f)\right)\log^2(f)$$

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

Rubi [A]
time = 0.04, antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2245, 2241}

$$\frac{1}{6}b^2f^a\log^2(f)\text{Ei}\left(bx^3\log(f)\right)-\frac{b\log(f)f^{a+bx^3}}{6x^3}-\frac{f^{a+bx^3}}{6x^6}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)/x^7,x]
```

```
[Out] -1/6*f^(a + b*x^3)/x^6 - (b*f^(a + b*x^3)*Log[f])/(6*x^3) + (b^2*f^a*ExpInt
egralEi[b*x^3*Log[f]]*Log[f]^2)/6
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int \frac{f^{a+bx^3}}{x^7}\,dx &= -\frac{f^{a+bx^3}}{6x^6}+\frac{1}{2}(b\log(f))\int \frac{f^{a+bx^3}}{x^4}\,dx\\ &= -\frac{f^{a+bx^3}}{6x^6}-\frac{bf^{a+bx^3}\log(f)}{6x^3}+\frac{1}{2}\left(b^2\log^2(f)\right)\int \frac{f^{a+bx^3}}{x}\,dx\\ &= -\frac{f^{a+bx^3}}{6x^6}-\frac{bf^{a+bx^3}\log(f)}{6x^3}+\frac{1}{6}b^2f^a\text{Ei}\left(bx^3\log(f)\right)\log^2(f)\end{aligned}$$

Mathematica [A]
time = 0.04, size = 48, normalized size = 0.83

$$\frac{f^a\left(b^2x^6\text{Ei}(bx^3\log(f))\log^2(f)-f^{bx^3}(1+bx^3\log(f))\right)}{6x^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)/x^7,x]
```

```
[Out] (f^a*(b^2*x^6*ExpIntegralEi[b*x^3*Log[f]]*Log[f]^2 - f^(b*x^3)*(1 + b*x^3*L
og[f])))/(6*x^6)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 140 vs. 2(52) = 104.
time = 0.03, size = 141, normalized size = 2.43

method	result
meijerg	$\frac{f^a b^2 \ln(f)^2 \left(\frac{9b^2x^6\ln(f)^2+12bx^3\ln(f)+6}{12b^2x^6\ln(f)^2}-\frac{\left(3+3bx^3\ln(f)\right)e^{bx^3\ln(f)}}{6b^2x^6\ln(f)^2}-\frac{\ln\left(-bx^3\ln(f)\right)}{2}-\frac{\text{expIntegral}\left(1,-bx^3\ln(f)\right)}{2}-\frac{3}{4}+\frac{3\ln(x)}{2}+\frac{\ln(-b)}{2}+\text{ln}\right.}{3}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)/x^7,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*f^a*b^2*ln(f)^2*(1/12/b^2/x^6/ln(f)^2*(9*b^2*x^6*ln(f)^2+12*b*x^3*ln(f)
+6)-1/6/b^2/x^6/ln(f)^2*(3+3*b*x^3*ln(f))*exp(b*x^3*ln(f))-1/2*ln(-b*x^3*ln
(f))-1/2*Ei(1,-b*x^3*ln(f))-3/4+3/2*ln(x)+1/2*ln(-b)+1/2*ln(ln(f))-1/2/b^2/
x^6/ln(f)^2-1/x^3/ln(f)/b)
```

Maxima [A]
time = 0.32, size = 22, normalized size = 0.38

$$-\frac{1}{3}\,b^2f^a\Gamma\left(-2,-bx^3\log\left(f\right)\right)\log\left(f\right)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^7,x, algorithm="maxima")
```

```
[Out] -1/3*b^2*f^a*gamma(-2, -b*x^3*log(f))*log(f)^2
```

Fricas [**A**]
time = 0.35, size = 48, normalized size = 0.83

$$\frac{b^2 f^a x^6 \mathrm{Ei}(bx^3 \log(f)) \log(f)^2 - (bx^3 \log(f) + 1) f^{bx^3+a}}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^7,x, algorithm="fricas")
```

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

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx^3}}{x^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)/x**7,x)
```

```
[Out] Integral(f**(a + b*x**3)/x**7, x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^7,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^3 + a)/x^7, x)
```

Mupad [**B**]
time = 3.32, size = 57, normalized size = 0.98

$$-\frac{b^2\,f^a\,\ln(f)^2\,\left(f^{b\,x^3}\,\left(\frac{1}{2\,b\,x^3\,\ln(f)}+\frac{1}{2\,b^2\,x^6\,\ln(f)^2}\right)+\frac{\mathrm{expint}\left(-b\,x^3\,\ln(f)\right)}{2}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)/x^7,x)
```

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

3.105 $\int \frac{f^{a+bx^3}}{x^{10}} \, dx$

Optimal. Leaf size=81

$$-\frac{f^{a+bx^3}}{9x^9}-\frac{bf^{a+bx^3}\log(f)}{18x^6}-\frac{b^2f^{a+bx^3}\log^2(f)}{18x^3}+\frac{1}{18}b^3f^a\text{Ei}\left(bx^3\log(f)\right)\log^3(f)$$

```
[Out] -1/9*f^(b*x^3+a)/x^9-1/18*b*f^(b*x^3+a)*ln(f)/x^6-1/18*b^2*f^(b*x^3+a)*ln(f
)^2/x^3+1/18*b^3*f^a*Ei(b*x^3*ln(f))*ln(f)^3
```

Rubi [A]
time = 0.06, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2245, 2241}

$$\frac{1}{18}b^3f^a\log^3(f)\text{Ei}\left(bx^3\log(f)\right)-\frac{b^2\log^2(f)f^{a+bx^3}}{18x^3}-\frac{f^{a+bx^3}}{9x^9}-\frac{b\log(f)f^{a+bx^3}}{18x^6}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)/x^10,x]
```

```
[Out] -1/9*f^(a + b*x^3)/x^9 - (b*f^(a + b*x^3)*Log[f])/(18*x^6) - (b^2*f^(a + b*
x^3)*Log[f]^2)/(18*x^3) + (b^3*f^a*ExpIntegralEi[b*x^3*Log[f]]*Log[f]^3)/18
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$
\begin{aligned}
\int \frac{f^{a+bx^3}}{x^{10}}\,dx &= -\frac{f^{a+bx^3}}{9x^9}+\frac{1}{3}(b\log(f))\int \frac{f^{a+bx^3}}{x^7}\,dx\\
&= -\frac{f^{a+bx^3}}{9x^9}-\frac{bf^{a+bx^3}\log(f)}{18x^6}+\frac{1}{6}\left(b^2\log^2(f)\right)\int \frac{f^{a+bx^3}}{x^4}\,dx\\
&= -\frac{f^{a+bx^3}}{9x^9}-\frac{bf^{a+bx^3}\log(f)}{18x^6}-\frac{b^2f^{a+bx^3}\log^2(f)}{18x^3}+\frac{1}{6}\left(b^3\log^3(f)\right)\int \frac{f^{a+bx^3}}{x}\,dx\\
&= -\frac{f^{a+bx^3}}{9x^9}-\frac{bf^{a+bx^3}\log(f)}{18x^6}-\frac{b^2f^{a+bx^3}\log^2(f)}{18x^3}+\frac{1}{18}b^3f^a\text{Ei}\left(bx^3\log(f)\right)\log^3(f)
\end{aligned}
$$

Mathematica [**A**]
time = 0.04, size = 59, normalized size = 0.73

$$
\frac{f^a\left(b^3x^9\text{Ei}(bx^3\log(f))\log^3(f)-f^{bx^3}\left(2+bx^3\log(f)+b^2x^6\log^2(f)\right)\right)}{18x^9}
$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)/x^10,x]
```

```
[Out] (f^a*(b^3*x^9*ExpIntegralEi[b*x^3*Log[f]]*Log[f]^3 - f^(b*x^3)*(2 + b*x^3*L
og[f] + b^2*x^6*Log[f]^2)))/(18*x^9)
```

Maple [**B**] Leaf count of result is larger than twice the leaf count of optimal. 176 vs. 2(73) = 146.
time = 0.03, size = 177, normalized size = 2.19

method	result
meijerg	$-\frac{f^a b^3\ln(f)^3\left(-\frac{22b^3x^9\ln(f)^3+36b^2x^6\ln(f)^2+36bx^3\ln(f)+24}{72b^3x^9\ln(f)^3}+\frac{\left(4b^2x^6\ln(f)^2+4bx^3\ln(f)+8\right)e^{bx^3\ln(f)}}{24b^3x^9\ln(f)^3}+\frac{\ln\left(-bx^3\ln(f)\right)}{6}+\frac{\text{expIntegral}\left(1,\right.}{6}\right.}{3}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)/x^10,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*f^a*b^3*ln(f)^3*(-1/72/b^3/x^9/ln(f)^3*(22*b^3*x^9*ln(f)^3+36*b^2*x^6*
ln(f)^2+36*b*x^3*ln(f)+24)+1/24/b^3/x^9/ln(f)^3*(4*b^2*x^6*ln(f)^2+4*b*x^3*
ln(f)+8)*exp(b*x^3*ln(f))+1/6*ln(-b*x^3*ln(f))+1/6*Ei(1,-b*x^3*ln(f))+11/36
-1/2*ln(x)-1/6*ln(-b)-1/6*ln(ln(f))+1/3/b^3/x^9/ln(f)^3+1/2/b^2/x^6/ln(f)^2
+1/2/x^3/ln(f)/b)
```

Maxima [**A**]
time = 0.33, size = 22, normalized size = 0.27

$$
\frac{1}{3}\,b^3f^a\Gamma\left(-3,-bx^3\log\left(f\right)\right)\log\left(f\right)^3
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^10,x, algorithm="maxima")
```

```
[Out] 1/3*b^3*f^a*gamma(-3, -b*x^3*log(f))*log(f)^3
```

Fricas [A]
time = 0.37, size = 59, normalized size = 0.73

$$\frac{b^3 f^a x^9 \text{Ei}(bx^3 \log(f)) \log(f)^3 - \left(b^2 x^6 \log(f)^2 + bx^3 \log(f) + 2\right) f^{bx^3+a}}{18\, x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^10,x, algorithm="fricas")
```

```
[Out] 1/18*(b^3*f^a*x^9*Ei(b*x^3*log(f))*log(f)^3 - (b^2*x^6*log(f)^2 + b*x^3*log
(f) + 2)*f^(b*x^3 + a))/x^9
```

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

$$\int \frac{f^{a+bx^3}}{x^{10}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)/x**10,x)
```

```
[Out] Integral(f**(a + b*x**3)/x**10, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^10,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^3 + a)/x^10, x)
```

Mupad [B]
time = 3.53, size = 69, normalized size = 0.85

$$-\frac{b^3\, f^a \ln(f)^3 \left(f^{b\,x^3} \left(\frac{1}{6\,b\,x^3\,\ln(f)} + \frac{1}{6\,b^2\,x^6\,\ln(f)^2} + \frac{1}{3\,b^3\,x^9\,\ln(f)^3}\right) + \frac{\mathrm{expint}\left(-b\,x^3\,\ln(f)\right)}{6}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)/x^10,x)
```

```
[Out] -(b^3*f^a*log(f)^3*(f^(b*x^3)*(1/(6*b*x^3*log(f)) + 1/(6*b^2*x^6*log(f)^2)
+ 1/(3*b^3*x^9*log(f)^3)) + expint(-b*x^3*log(f))/6))/3
```

3.106 $\int \frac{f^{a+bx^3}}{x^{13}} dx$

Optimal. Leaf size=24

$$-\frac{1}{3}b^4 f^a \Gamma\left(-4,-bx^3\log(f)\right)\log^4(f)$$

```
[Out] -1/3*f^a/x^12*Ei(5,-b*x^3*ln(f))
```

Rubi [A]
time = 0.01, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$-\frac{1}{3}b^4 f^a \log^4(f)\text{Gamma}\left(-4,-bx^3\log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)/x^13,x]
```

```
[Out] -1/3*(b^4*f^a*Gamma[-4, -(b*x^3*Log[f])]*Log[f]^4)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^3}}{x^{13}} dx = -\frac{1}{3}b^4 f^a \Gamma\left(-4,-bx^3\log(f)\right)\log^4(f)$$

Mathematica [A]
time = 0.03, size = 24, normalized size = 1.00

$$-\frac{1}{3}b^4 f^a \Gamma\left(-4,-bx^3\log(f)\right)\log^4(f)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)/x^13,x]
```

```
[Out] -1/3*(b^4*f^a*Gamma[-4, -(b*x^3*Log[f])]*Log[f]^4)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 212 vs. 2(18) = 36.
time = 0.04, size = 213, normalized size = 8.88

method	result
meijerg	$\frac{f^a b^4 \ln(f)^4 \left(\frac{125b^4x^{12}\ln(f)^4+240b^3x^9\ln(f)^3+360b^2x^6\ln(f)^2+480b\,x^3\ln(f)+360}{1440b^4x^{12}\ln(f)^4} - \frac{\left(5b^3x^9\ln(f)^3+5b^2x^6\ln(f)^2+10b\,x^3\ln(f)+30\right)e^{b\,x^3\ln(f)}}{120b^4x^{12}\ln(f)^4} - \cdots \right.}{3}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)/x^13,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*f^a*b^4*ln(f)^4*(1/1440/b^4/x^12/ln(f)^4*(125*b^4*x^12*ln(f)^4+240*b^3*
x^9*ln(f)^3+360*b^2*x^6*ln(f)^2+480*b*x^3*ln(f)+360)-1/120/b^4/x^12/ln(f)^4
*(5*b^3*x^9*ln(f)^3+5*b^2*x^6*ln(f)^2+10*b*x^3*ln(f)+30)*exp(b*x^3*ln(f))-1
/24*ln(-b*x^3*ln(f))-1/24*Ei(1,-b*x^3*ln(f))-25/288+1/8*ln(x)+1/24*ln(-b)+1
/24*ln(ln(f))-1/4/b^4/x^12/ln(f)^4-1/3/b^3/x^9/ln(f)^3-1/4/b^2/x^6/ln(f)^2-
1/6/x^3/ln(f)/b)
```

Maxima [A]
time = 0.06, size = 22, normalized size = 0.92

$$-\frac{1}{3}\,b^4 f^a \Gamma\left(-4, -bx^3\log\left(f\right)\right)\log\left(f\right)^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^13,x, algorithm="maxima")
```

```
[Out] -1/3*b^4*f^a*gamma(-4, -b*x^3*log(f))*log(f)^4
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 71 vs. 2(18) = 36.
time = 0.10, size = 71, normalized size = 2.96

$$\frac{b^4 f^a x^{12}\mathrm{Ei}\left(bx^3\log\left(f\right)\right)\log\left(f\right)^4 - \left(b^3x^9\log\left(f\right)^3 + b^2x^6\log\left(f\right)^2 + 2\,bx^3\log\left(f\right) + 6\right)f^{bx^3+a}}{72\,x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^13,x, algorithm="fricas")
```

```
[Out] 1/72*(b^4*f^a*x^12*Ei(b*x^3*log(f))*log(f)^4 - (b^3*x^9*log(f)^3 + b^2*x^6*
log(f)^2 + 2*b*x^3*log(f) + 6)*f^(b*x^3 + a))/x^12
```

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

$$\int \frac{f^{a+bx^3}}{x^{13}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)/x**13,x)
```

```
[Out] Integral(f**(a + b*x**3)/x**13, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^13,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^3 + a)/x^13, x)
```

Mupad [B]
time = 3.58, size = 90, normalized size = 3.75

$$-\frac{b^4\,f^a\ln\left(f\right)^4\,\mathrm{expint}(-b\,x^3\,\ln\left(f\right))}{72}-\frac{b^4\,f^a\,f^{b\,x^3}\ln\left(f\right)^4\left(\frac{1}{24\,b\,x^3\,\ln(f)}+\frac{1}{24\,b^2\,x^6\ln(f)^2}+\frac{1}{12\,b^3\,x^9\ln(f)^3}+\frac{1}{4\,b^4\,x^{12}\ln(f)^4}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)/x^13,x)
```

```
[Out] - (b^4*f^a*log(f)^4*expint(-b*x^3*log(f)))/72 - (b^4*f^a*f^(b*x^3)*log(f)^4
*(1/(24*b*x^3*log(f)) + 1/(24*b^2*x^6*log(f)^2) + 1/(12*b^3*x^9*log(f)^3) +
 1/(4*b^4*x^12*log(f)^4)))/3
```

3.107 $\int \frac{f^{a+bx^3}}{x^{16}}\,dx$

Optimal. Leaf size=24

$$\frac{1}{3}b^5 f^a \Gamma\left(-5,-bx^3\log(f)\right)\log^5(f)$$

```
[Out] -1/3*f^a/x^15*Ei(6,-b*x^3*ln(f))
```

Rubi [A]
time = 0.01, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$\frac{1}{3}b^5 f^a \log^5(f)\text{Gamma}\left(-5,-bx^3\log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)/x^16,x]
```

```
[Out] (b^5*f^a*Gamma[-5, -(b*x^3*Log[f])]*Log[f]^5)/3
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^3}}{x^{16}}\,dx = \frac{1}{3}b^5 f^a \Gamma\left(-5,-bx^3\log(f)\right)\log^5(f)$$

Mathematica [A]
time = 0.03, size = 24, normalized size = 1.00

$$\frac{1}{3}b^5 f^a \Gamma\left(-5,-bx^3\log(f)\right)\log^5(f)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)/x^16,x]
```

```
[Out] (b^5*f^a*Gamma[-5, -(b*x^3*Log[f])]*Log[f]^5)/3
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 248 vs. $2(18) = 36$.

time = 0.04, size = 249, normalized size = 10.38

method	result
meijerg	$-\frac{f^a b^5 \ln(f)^5 \left(-\frac{137b^5x^{15}\ln(f)^5+300b^4x^{12}\ln(f)^4+600b^3x^9\ln(f)^3+1200b^2x^6\ln(f)^2+1800b\,x^3\ln(f)+1440}{7200b^5x^{15}\ln(f)^5}+\frac{\left(6b^4x^{12}\ln(f)^4+6b^3x^9\ln(f)^3+12\right.}{720}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)/x^16,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*f^a*b^5*ln(f)^5*(-1/7200/b^5/x^15/ln(f)^5*(137*b^5*x^15*ln(f)^5+300*b^
4*x^12*ln(f)^4+600*b^3*x^9*ln(f)^3+1200*b^2*x^6*ln(f)^2+1800*b*x^3*ln(f)+14
40)+1/720/b^5/x^15/ln(f)^5*(6*b^4*x^12*ln(f)^4+6*b^3*x^9*ln(f)^3+12*b^2*x^6
*ln(f)^2+36*b*x^3*ln(f)+144)*exp(b*x^3*ln(f))+1/120*ln(-b*x^3*ln(f))+1/120*
Ei(1,-b*x^3*ln(f))+137/7200-1/40*ln(x)-1/120*ln(-b)-1/120*ln(ln(f))+1/5/b^5
/x^15/ln(f)^5+1/4/b^4/x^12/ln(f)^4+1/6/b^3/x^9/ln(f)^3+1/12/b^2/x^6/ln(f)^2
+1/24/x^3/ln(f)/b)
```

Maxima [A]

time = 0.06, size = 22, normalized size = 0.92

$$\frac{1}{3}\,b^5 f^a \Gamma\left(-5, -bx^3 \log(f)\right) \log(f)^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^16,x, algorithm="maxima")
```

```
[Out] 1/3*b^5*f^a*gamma(-5, -b*x^3*log(f))*log(f)^5
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 83 vs. $2(18) = 36$.

time = 0.09, size = 83, normalized size = 3.46

$$\frac{b^5 f^a x^{15} \mathrm{Ei}(bx^3 \log(f)) \log(f)^5 - \left(b^4x^{12}\log(f)^4 + b^3x^9\log(f)^3 + 2\,b^2x^6\log(f)^2 + 6\,bx^3\log(f) + 24\right) f^{bx^3+a}}{360\,x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^16,x, algorithm="fricas")
```

```
[Out] 1/360*(b^5*f^a*x^15*Ei(b*x^3*log(f))*log(f)^5 - (b^4*x^12*log(f)^4 + b^3*x^
9*log(f)^3 + 2*b^2*x^6*log(f)^2 + 6*b*x^3*log(f) + 24)*f^(b*x^3 + a))/x^15
```

Sympy [F]

time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx^3}}{x^{16}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)/x**16,x)
```

```
[Out] Integral(f**(a + b*x**3)/x**16, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^16,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^3 + a)/x^16, x)
```

Mupad [B]
time = 3.47, size = 102, normalized size = 4.25

$$-\frac{b^5\,f^a\ln\left(f\right)^5\,\mathrm{expint}(-b\,x^3\,\ln\left(f\right))}{360}-\frac{b^5\,f^a\,f^{b\,x^3}\ln\left(f\right)^5\left(\frac{1}{120\,b\,x^3\,\ln(f)}+\frac{1}{120\,b^2\,x^6\ln(f)^2}+\frac{1}{60\,b^3\,x^9\ln(f)^3}+\frac{1}{20\,b^4\,x^{12}\ln(f)^4}+\frac{1}{5\,b^5\,x^{15}\ln(f)^5}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)/x^16,x)
```

```
[Out] - (b^5*f^a*log(f)^5*expint(-b*x^3*log(f)))/360 - (b^5*f^a*f^(b*x^3)*log(f)^
5*(1/(120*b*x^3*log(f)) + 1/(120*b^2*x^6*log(f)^2) + 1/(60*b^3*x^9*log(f)^3
) + 1/(20*b^4*x^12*log(f)^4) + 1/(5*b^5*x^15*log(f)^5)))/3
```

3.108 $\int f^{a+bx^3} x^4\,dx$

Optimal. Leaf size=34

$$-\frac{f^a x^5 \Gamma\left(\frac{5}{3}, -bx^3 \log(f)\right)}{3\left(-bx^3 \log(f)\right)^{5/3}}$$

```
[Out] -1/3*f^a*x^5*GAMMA(5/3,-b*x^3*ln(f))/(-b*x^3*ln(f))^(5/3)
```

Rubi [A]
time = 0.01, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$-\frac{x^5 f^a \text{Gamma}\left(\frac{5}{3}, -bx^3 \log(f)\right)}{3\left(-bx^3 \log(f)\right)^{5/3}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)*x^4,x]
```

```
[Out] -1/3*(f^a*x^5*Gamma[5/3, -(b*x^3*Log[f])])/(-(b*x^3*Log[f]))^(5/3)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^3} x^4\,dx = -\frac{f^a x^5 \Gamma\left(\frac{5}{3}, -bx^3 \log(f)\right)}{3\left(-bx^3 \log(f)\right)^{5/3}}$$

Mathematica [A]
time = 0.06, size = 34, normalized size = 1.00

$$-\frac{f^a x^5 \Gamma\left(\frac{5}{3}, -bx^3 \log(f)\right)}{3\left(-bx^3 \log(f)\right)^{5/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)*x^4,x]
```

```
[Out] -1/3*(f^a*x^5*Gamma[5/3, -(b*x^3*Log[f])])/(-(b*x^3*Log[f]))^(5/3)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 105 vs. $2(28) = 56$.
time = 0.02, size = 106, normalized size = 3.12

method	result	size
meijerg	$\frac{f^{a}\left(-\frac{2x^{2}(-b)^{\frac{5}{3}}\ln(f)^{\frac{2}{3}}\Gamma\left(\frac{2}{3}\right)}{3b\left(-b\,x^{3}\ln(f)\right)^{\frac{2}{3}}}+\frac{x^{2}(-b)^{\frac{5}{3}}\ln(f)^{\frac{2}{3}}{\mathrm e}^{b\,x^{3}\ln(f)}}{b}+\frac{2x^{2}(-b)^{\frac{5}{3}}\ln(f)^{\frac{2}{3}}\Gamma\left(\frac{2}{3},-b\,x^{3}\ln(f)\right)}{3b\left(-b\,x^{3}\ln(f)\right)^{\frac{2}{3}}}\right)}{3(-b)^{\frac{5}{3}}\ln(f)^{\frac{5}{3}}}$	106

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)*x^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*f^a/(-b)^(5/3)/ln(f)^(5/3)*(-2/3*x^2*(-b)^(5/3)*ln(f)^(2/3)/b*GAMMA(2/3
)/(-b*x^3*ln(f))^(2/3)+x^2*(-b)^(5/3)*ln(f)^(2/3)/b*exp(b*x^3*ln(f))+2/3*x^
2*(-b)^(5/3)*ln(f)^(2/3)/b/(-b*x^3*ln(f))^(2/3)*GAMMA(2/3,-b*x^3*ln(f)))
```

Maxima [A]
time = 0.06, size = 28, normalized size = 0.82

$$-\frac{f^{a}x^{5}\Gamma\left(\frac{5}{3}, -bx^{3}\log\left(f\right)\right)}{3\,\left(-bx^{3}\log\left(f\right)\right)^{\frac{5}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^4,x, algorithm="maxima")
```

```
[Out] -1/3*f^a*x^5*gamma(5/3, -b*x^3*log(f))/(-b*x^3*log(f))^(5/3)
```

Fricas [A]
time = 0.09, size = 49, normalized size = 1.44

$$\frac{3\,bf^{bx^{3}+a}x^{2}\log\left(f\right) - 2\,\left(-b\log\left(f\right)\right)^{\frac{1}{3}}\,f^{a}\Gamma\left(\frac{2}{3}, -bx^{3}\log\left(f\right)\right)}{9\,b^{2}\log\left(f\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^4,x, algorithm="fricas")
```

```
[Out] 1/9*(3*b*f^(b*x^3 + a)*x^2*log(f) - 2*(-b*log(f))^(1/3)*f^a*gamma(2/3, -b*x
^3*log(f)))/(b^2*log(f)^2)
```

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

$$\int f^{a+bx^{3}}x^{4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)*x**4,x)
```

```
[Out] Integral(f**(a + b*x**3)*x**4, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^4,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^3 + a)*x^4, x)
```

Mupad [B]
time = 3.56, size = 71, normalized size = 2.09

$$\frac{2\,f^a\,x^5\,\Gamma\left(\frac{2}{3}\right)}{9\,{\left(-b\,x^3\,\ln\left(f\right)\right)}^{5/3}}-\frac{2\,f^a\,x^5\,\Gamma\left(\frac{2}{3},-b\,x^3\,\ln\left(f\right)\right)}{9\,{\left(-b\,x^3\,\ln\left(f\right)\right)}^{5/3}}+\frac{f^a\,f^{b\,x^3}\,x^2}{3\,b\,\ln\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)*x^4,x)
```

```
[Out] (2*f^a*x^5*gamma(2/3))/(9*(-b*x^3*log(f))^(5/3)) - (2*f^a*x^5*igamma(2/3, -
b*x^3*log(f)))/(9*(-b*x^3*log(f))^(5/3)) + (f^a*f^(b*x^3)*x^2)/(3*b*log(f))
```

3.109 $\int f^{a+bx^3}x^3\,dx$

Optimal. Leaf size=34

$$-\frac{f^a x^4 \Gamma\left(\frac{4}{3},-b x^3 \log(f)\right)}{3\left(-b x^3 \log(f)\right)^{4/3}}$$

```
[Out] -1/3*f^a*x^4*GAMMA(4/3,-b*x^3*ln(f))/(-b*x^3*ln(f))^(4/3)
```

Rubi [A]
time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$-\frac{x^4 f^a \text{Gamma}\left(\frac{4}{3},-b x^3 \log(f)\right)}{3\left(-b x^3 \log(f)\right)^{4/3}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)*x^3,x]
```

```
[Out] -1/3*(f^a*x^4*Gamma[4/3, -(b*x^3*Log[f])])/(-(b*x^3*Log[f]))^(4/3)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^3}x^3\,dx=-\frac{f^a x^4 \Gamma\left(\frac{4}{3},-b x^3 \log(f)\right)}{3\left(-b x^3 \log(f)\right)^{4/3}}$$

Mathematica [A]
time = 0.05, size = 34, normalized size = 1.00

$$-\frac{f^a x^4 \Gamma\left(\frac{4}{3},-b x^3 \log(f)\right)}{3\left(-b x^3 \log(f)\right)^{4/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)*x^3,x]
```

```
[Out] -1/3*(f^a*x^4*Gamma[4/3, -(b*x^3*Log[f])])/(-(b*x^3*Log[f]))^(4/3)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 108 vs. $2(28) = 56$.
time = 0.03, size = 109, normalized size = 3.21

method	result	size
meijerg	$-\frac{f^{a}\left(-\frac{2x(-b)^{\frac{4}{3}}\ln(f)^{\frac{1}{3}}\pi\sqrt{3}}{9b\Gamma\left(\frac{2}{3}\right)\left(-b\,x^{3}\ln(f)\right)^{\frac{1}{3}}}+\frac{x(-b)^{\frac{4}{3}}\ln(f)^{\frac{1}{3}}e^{b\,x^{3}\ln(f)}}{b}+\frac{x(-b)^{\frac{4}{3}}\ln(f)^{\frac{1}{3}}\Gamma\left(\frac{1}{3},-b\,x^{3}\ln(f)\right)}{3b\left(-b\,x^{3}\ln(f)\right)^{\frac{1}{3}}}\right)}{3b\ln(f)^{\frac{4}{3}}(-b)^{\frac{1}{3}}}$	109

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)*x^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*f^a/b/ln(f)^(4/3)/(-b)^(1/3)*(-2/9*x*(-b)^(4/3)*ln(f)^(1/3)/b*Pi*3^(1/
2)/GAMMA(2/3)/(-b*x^3*ln(f))^(1/3)+x*(-b)^(4/3)*ln(f)^(1/3)/b*exp(b*x^3*ln(
f))+1/3*x*(-b)^(4/3)*ln(f)^(1/3)/b/(-b*x^3*ln(f))^(1/3)*GAMMA(1/3,-b*x^3*ln
(f)))
```

Maxima [A]
time = 0.06, size = 28, normalized size = 0.82

$$-\frac{f^{a}x^{4}\Gamma\left(\frac{4}{3},-bx^{3}\log\left(f\right)\right)}{3\left(-bx^{3}\log\left(f\right)\right)^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/3*f^a*x^4*gamma(4/3, -b*x^3*log(f))/(-b*x^3*log(f))^(4/3)
```

Fricas [A]
time = 0.12, size = 47, normalized size = 1.38

$$\frac{3\,bf^{bx^{3}+a}x\log\left(f\right)-\left(-b\log\left(f\right)\right)^{\frac{2}{3}}f^{a}\Gamma\left(\frac{1}{3},-bx^{3}\log\left(f\right)\right)}{9\,b^{2}\log\left(f\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/9*(3*b*f^(b*x^3 + a)*x*log(f) - (-b*log(f))^(2/3)*f^a*gamma(1/3, -b*x^3*l
og(f)))/(b^2*log(f)^2)
```

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

$$\int f^{a+bx^{3}}x^{3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)*x**3,x)
```

```
[Out] Integral(f**(a + b*x**3)*x**3, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^(b*x^3 + a)*x^3, x)
```

Mupad [B]
time = 3.18, size = 75, normalized size = 2.21

$$\frac{f^a\,f^{b\,x^3}\,x}{3\,b\,\ln\left(f\right)}-\frac{f^a\,x^4\,\Gamma\left(\frac{1}{3},-b\,x^3\,\ln\left(f\right)\right)}{9\,{\left(-b\,x^3\,\ln\left(f\right)\right)}^{4/3}}+\frac{2\,\pi\,\sqrt{3}\,f^a\,x^4}{27\,\Gamma\left(\frac{2}{3}\right)\,{\left(-b\,x^3\,\ln\left(f\right)\right)}^{4/3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)*x^3,x)
```

```
[Out] (f^a*f^(b*x^3)*x)/(3*b*log(f)) - (f^a*x^4*igamma(1/3, -b*x^3*log(f)))/(9*(-
b*x^3*log(f))^(4/3)) + (2*3^(1/2)*f^a*x^4*pi)/(27*gamma(2/3)*(-b*x^3*log(f)
)^(4/3))
```

3.110 $\int f^{a+bx^3} x \, dx$

Optimal. Leaf size=34

$$-\frac{f^a x^2 \Gamma\left(\frac{2}{3}, -bx^3 \log(f)\right)}{3\left(-bx^3 \log(f)\right)^{2/3}}$$

```
[Out] -1/3*f^a*x^2*GAMMA(2/3,-b*x^3*ln(f))/(-b*x^3*ln(f))^(2/3)
```

Rubi [A]
time = 0.01, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2250}

$$-\frac{x^2 f^a \text{Gamma}\left(\frac{2}{3}, -bx^3 \log(f)\right)}{3\left(-bx^3 \log(f)\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)*x,x]
```

```
[Out] -1/3*(f^a*x^2*Gamma[2/3, -(b*x^3*Log[f])])/(-(b*x^3*Log[f]))^(2/3)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^3} x \, dx = -\frac{f^a x^2 \Gamma\left(\frac{2}{3}, -bx^3 \log(f)\right)}{3\left(-bx^3 \log(f)\right)^{2/3}}$$

Mathematica [A]
time = 0.05, size = 34, normalized size = 1.00

$$-\frac{f^a x^2 \Gamma\left(\frac{2}{3}, -bx^3 \log(f)\right)}{3\left(-bx^3 \log(f)\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)*x,x]
```

```
[Out] -1/3*(f^a*x^2*Gamma[2/3, -(b*x^3*Log[f])])/(-(b*x^3*Log[f]))^(2/3)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 74 vs. $2(28) = 56$.
time = 0.01, size = 75, normalized size = 2.21

method	result	size
meijerg	$\frac{f^{a}\left(\frac{x^{2}(-b)^{\frac{2}{3}}\ln(f)^{\frac{2}{3}}\Gamma\left(\frac{2}{3}\right)}{\left(-b\,x^{3}\ln(f)\right)^{\frac{2}{3}}}-\frac{x^{2}(-b)^{\frac{2}{3}}\ln(f)^{\frac{2}{3}}\Gamma\left(\frac{2}{3},-b\,x^{3}\ln(f)\right)}{\left(-b\,x^{3}\ln(f)\right)^{\frac{2}{3}}}\right)}{3(-b)^{\frac{2}{3}}\ln(f)^{\frac{2}{3}}}$	75

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)*x,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*f^a/(-b)^(2/3)/ln(f)^(2/3)*(x^2*(-b)^(2/3)*ln(f)^(2/3)*GAMMA(2/3)/(-b*x
^3*ln(f))^(2/3)-x^2*(-b)^(2/3)*ln(f)^(2/3)/(-b*x^3*ln(f))^(2/3)*GAMMA(2/3,-
b*x^3*ln(f)))
```

Maxima [A]
time = 0.06, size = 28, normalized size = 0.82

$$-\frac{f^{a}x^{2}\Gamma\left(\frac{2}{3},-bx^{3}\log\left(f\right)\right)}{3\,\left(-bx^{3}\log\left(f\right)\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/3*f^a*x^2*gamma(2/3, -b*x^3*log(f))/(-b*x^3*log(f))^(2/3)
```

Fricas [A]
time = 0.08, size = 29, normalized size = 0.85

$$\frac{\left(-b\log\left(f\right)\right)^{\frac{1}{3}}f^{a}\Gamma\left(\frac{2}{3},-bx^{3}\log\left(f\right)\right)}{3\,b\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*(-b*log(f))^(1/3)*f^a*gamma(2/3, -b*x^3*log(f))/(b*log(f))
```

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

$$\int f^{a+bx^{3}}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)*x,x)
```

```
[Out] Integral(f**(a + b*x**3)*x, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^(b*x^3 + a)*x, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.03

$$\int f^{b\,x^3+a}\,x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)*x,x)
```

```
[Out] int(f^(a + b*x^3)*x, x)
```

3.111 $\int f^{a+bx^3}\,dx$

Optimal. Leaf size=32

$$-\frac{f^a x\Gamma\left(\frac{1}{3},-bx^3\log(f)\right)}{3\sqrt[3]{-bx^3\log(f)}}$$

```
[Out] -1/3*f^a*x*GAMMA(1/3,-b*x^3*ln(f))/(-b*x^3*ln(f))^(1/3)
```

Rubi [A]
time = 0.00, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2239}

$$-\frac{xf^a\text{Gamma}\left(\frac{1}{3},-bx^3\log(f)\right)}{3\sqrt[3]{-bx^3\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3),x]
```

```
[Out] -1/3*(f^a*x*Gamma[1/3, -(b*x^3*Log[f])])/(-(b*x^3*Log[f]))^(1/3)
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rubi steps

$$\int f^{a+bx^3}\,dx = -\frac{f^a x\Gamma\left(\frac{1}{3},-bx^3\log(f)\right)}{3\sqrt[3]{-bx^3\log(f)}}$$

Mathematica [A]
time = 0.05, size = 32, normalized size = 1.00

$$-\frac{f^a x\Gamma\left(\frac{1}{3},-bx^3\log(f)\right)}{3\sqrt[3]{-bx^3\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3),x]
```

```
[Out] -1/3*(f^a*x*Gamma[1/3, -(b*x^3*Log[f])])/(-(b*x^3*Log[f]))^(1/3)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 77 vs. $2(26) = 52$.
time = 0.01, size = 78, normalized size = 2.44

method	result	size
meijerg	$\frac{f^a\left(\frac{2x(-b)^{\frac{1}{3}}\ln(f)^{\frac{1}{3}}\pi\sqrt{3}}{3\Gamma\left(\frac{2}{3}\right)\left(-b\,x^3\ln(f)\right)^{\frac{1}{3}}}-\frac{x(-b)^{\frac{1}{3}}\ln(f)^{\frac{1}{3}}\Gamma\left(\frac{1}{3},-b\,x^3\ln(f)\right)}{\left(-b\,x^3\ln(f)\right)^{\frac{1}{3}}}\right)}{3(-b)^{\frac{1}{3}}\ln(f)^{\frac{1}{3}}}$	78

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a),x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*f^a/(-b)^(1/3)/ln(f)^(1/3)*(2/3*x*(-b)^(1/3)*ln(f)^(1/3)*Pi*3^(1/2)/GAM
MA(2/3)/(-b*x^3*ln(f))^(1/3)-x*(-b)^(1/3)*ln(f)^(1/3)/(-b*x^3*ln(f))^(1/3)*
GAMMA(1/3,-b*x^3*ln(f)))
```

Maxima [A]
time = 0.06, size = 26, normalized size = 0.81

$$-\frac{f^a x\Gamma\left(\frac{1}{3}, -bx^3\log\left(f\right)\right)}{3\,\left(-bx^3\log\left(f\right)\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/3*f^a*x*gamma(1/3, -b*x^3*log(f))/(-b*x^3*log(f))^(1/3)
```

Fricas [A]
time = 0.10, size = 29, normalized size = 0.91

$$\frac{\left(-b\log\left(f\right)\right)^{\frac{2}{3}}\,f^a\Gamma\left(\frac{1}{3}, -bx^3\log\left(f\right)\right)}{3\,b\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*(-b*log(f))^(2/3)*f^a*gamma(1/3, -b*x^3*log(f))/(b*log(f))
```

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

$$\int f^{a+bx^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a),x)
```

```
[Out] Integral(f**(a + b*x**3), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^(b*x^3 + a), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.03

$$\int f^{b\,x^3+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3),x)
```

```
[Out] int(f^(a + b*x^3), x)
```

3.112 $\int \frac{f^{a+bx^3}}{x^2} \, dx$

Optimal. Leaf size=34

$$-\frac{f^a\Gamma\left(-\frac{1}{3},-bx^3\log(f)\right)\sqrt[3]{-bx^3\log(f)}}{3x}$$

```
[Out] -1/3*f^a*GAMMA(-1/3,-b*x^3*ln(f))*(-b*x^3*ln(f))^(1/3)/x
```

Rubi [A]
time = 0.01, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = $\{2250\}$

$$-\frac{f^a\sqrt[3]{-bx^3\log(f)}\,\text{Gamma}\left(-\frac{1}{3},-bx^3\log(f)\right)}{3x}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)/x^2,x]
```

```
[Out] -1/3*(f^a*Gamma[-1/3, -(b*x^3*Log[f])]*(-(b*x^3*Log[f]))^(1/3))/x
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^3}}{x^2} \, dx = -\frac{f^a\Gamma\left(-\frac{1}{3},-bx^3\log(f)\right)\sqrt[3]{-bx^3\log(f)}}{3x}$$

Mathematica [A]
time = 0.06, size = 34, normalized size = 1.00

$$-\frac{f^a\Gamma\left(-\frac{1}{3},-bx^3\log(f)\right)\sqrt[3]{-bx^3\log(f)}}{3x}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)/x^2,x]
```

```
[Out] -1/3*(f^a*Gamma[-1/3, -(b*x^3*Log[f])]*(-(b*x^3*Log[f]))^(1/3))/x
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 99 vs. $2(28) = 56$.
time = 0.02, size = 100, normalized size = 2.94

method	result	size
meijerg	$\frac{f^{a}(-b)^{\frac{1}{3}}\ln(f)^{\frac{1}{3}}\left(\frac{3x^{2}\ln(f)^{\frac{2}{3}}b\Gamma\left(\frac{2}{3}\right)}{(-b)^{\frac{1}{3}}\left(-b\,x^{3}\ln(f)\right)^{\frac{2}{3}}}-\frac{3\,\mathrm{e}^{b\,x^{3}\ln(f)}}{x(-b)^{\frac{1}{3}}\ln(f)^{\frac{1}{3}}}-\frac{3x^{2}\ln(f)^{\frac{2}{3}}b\Gamma\left(\frac{2}{3},-b\,x^{3}\ln(f)\right)}{(-b)^{\frac{1}{3}}\left(-b\,x^{3}\ln(f)\right)^{\frac{2}{3}}}\right)}{3}$	100

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*f^a*(-b)^(1/3)*ln(f)^(1/3)*(3*x^2/(-b)^(1/3)*ln(f)^(2/3)*b*GAMMA(2/3)/(
-b*x^3*ln(f))^(2/3)-3/x/(-b)^(1/3)/ln(f)^(1/3)*exp(b*x^3*ln(f))-3*x^2/(-b)^
(1/3)*ln(f)^(2/3)*b/(-b*x^3*ln(f))^(2/3)*GAMMA(2/3,-b*x^3*ln(f)))
```

Maxima [A]
time = 0.06, size = 28, normalized size = 0.82

$$-\frac{\left(-bx^{3}\log\left(f\right)\right)^{\frac{1}{3}}f^{a}\Gamma\left(-\frac{1}{3},-bx^{3}\log\left(f\right)\right)}{3\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^2,x, algorithm="maxima")
```

```
[Out] -1/3*(-b*x^3*log(f))^(1/3)*f^a*gamma(-1/3, -b*x^3*log(f))/x
```

Fricas [A]
time = 0.10, size = 38, normalized size = 1.12

$$\frac{\left(-b\log\left(f\right)\right)^{\frac{1}{3}}f^{a}x\Gamma\left(\frac{2}{3},-bx^{3}\log\left(f\right)\right)-f^{bx^{3}+a}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^2,x, algorithm="fricas")
```

```
[Out] ((-b*log(f))^(1/3)*f^a*x*gamma(2/3, -b*x^3*log(f)) - f^(b*x^3 + a))/x
```

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

$$\int\frac{f^{a+bx^{3}}}{x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)/x**2,x)
```

```
[Out] Integral(f**(a + b*x**3)/x**2, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^2,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^3 + a)/x^2, x)
```

Mupad [B]
time = 3.47, size = 63, normalized size = 1.85

$$\frac{f^a\,\Gamma\left(\frac{2}{3},-b\,x^3\,\ln\left(f\right)\right)\,{\left(-b\,x^3\,\ln\left(f\right)\right)}^{1/3}}{x}-\frac{f^a\,\Gamma\left(\frac{2}{3}\right)\,{\left(-b\,x^3\,\ln\left(f\right)\right)}^{1/3}}{x}-\frac{f^a\,f^{b\,x^3}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)/x^2,x)
```

```
[Out] (f^a*igamma(2/3, -b*x^3*log(f))*(-b*x^3*log(f))^(1/3))/x - (f^a*gamma(2/3)*
(-b*x^3*log(f))^(1/3))/x - (f^a*f^(b*x^3))/x
```

3.113 $\int \frac{f^{a+bx^3}}{x^3} \, dx$

Optimal. Leaf size=34

$$-\frac{f^a\Gamma\left(-\frac{2}{3},-bx^3\log(f)\right)\left(-bx^3\log(f)\right)^{2/3}}{3x^2}$$

```
[Out] -1/3*f^a*GAMMA(-2/3,-b*x^3*ln(f))*(-b*x^3*ln(f))^(2/3)/x^2
```

Rubi [A]
time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$-\frac{f^a\left(-bx^3\log(f)\right)^{2/3}\text{Gamma}\left(-\frac{2}{3},-bx^3\log(f)\right)}{3x^2}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)/x^3,x]
```

```
[Out] -1/3*(f^a*Gamma[-2/3, -(b*x^3*Log[f])]*(-(b*x^3*Log[f]))^(2/3))/x^2
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^3}}{x^3} \, dx = -\frac{f^a\Gamma\left(-\frac{2}{3},-bx^3\log(f)\right)\left(-bx^3\log(f)\right)^{2/3}}{3x^2}$$

Mathematica [A]
time = 0.06, size = 34, normalized size = 1.00

$$-\frac{f^a\Gamma\left(-\frac{2}{3},-bx^3\log(f)\right)\left(-bx^3\log(f)\right)^{2/3}}{3x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)/x^3,x]
```

```
[Out] -1/3*(f^a*Gamma[-2/3, -(b*x^3*Log[f])]*(-(b*x^3*Log[f]))^(2/3))/x^2
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 101 vs. $2(28) = 56$.
time = 0.02, size = 102, normalized size = 3.00

method	result	size
meijerg	$-\frac{f^{a} b \ln(f)^{\frac{2}{3}} \left(\frac{x \ln(f)^{\frac{1}{3}} b \pi \sqrt{3}}{(-b)^{\frac{2}{3}} \Gamma\left(\frac{2}{3}\right) \left(-b\, x^{3} \ln(f)\right)^{\frac{1}{3}}}-\frac{3\, \mathrm{e}^{b\, x^{3} \ln(f)}}{2 x^{2} (-b)^{\frac{2}{3}} \ln(f)^{\frac{2}{3}}}-\frac{3 x \ln(f)^{\frac{1}{3}} b \Gamma\left(\frac{1}{3}, -b\, x^{3} \ln(f)\right)}{2 (-b)^{\frac{2}{3}} \left(-b\, x^{3} \ln(f)\right)^{\frac{1}{3}}}\right)}{3 (-b)^{\frac{1}{3}}}$	102

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*f^a*b*ln(f)^(2/3)/(-b)^(1/3)*(x/(-b)^(2/3)*ln(f)^(1/3)*b*Pi*3^(1/2)/GA
MMA(2/3)/(-b*x^3*ln(f))^(1/3)-3/2/x^2/(-b)^(2/3)/ln(f)^(2/3)*exp(b*x^3*ln(f
))-3/2*x/(-b)^(2/3)*ln(f)^(1/3)*b/(-b*x^3*ln(f))^(1/3)*GAMMA(1/3,-b*x^3*ln(
f)))
```

Maxima [A]
time = 0.06, size = 28, normalized size = 0.82

$$-\frac{\left(-b x^{3} \log\left(f\right)\right)^{\frac{2}{3}} f^{a} \Gamma\left(-\frac{2}{3}, -b x^{3} \log\left(f\right)\right)}{3\, x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/3*(-b*x^3*log(f))^(2/3)*f^a*gamma(-2/3, -b*x^3*log(f))/x^2
```

Fricas [A]
time = 0.11, size = 41, normalized size = 1.21

$$\frac{\left(-b \log\left(f\right)\right)^{\frac{2}{3}} f^{a} x^{2} \Gamma\left(\frac{1}{3}, -b x^{3} \log\left(f\right)\right) - f^{b x^{3}+a}}{2\, x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*((-b*log(f))^(2/3)*f^a*x^2*gamma(1/3, -b*x^3*log(f)) - f^(b*x^3 + a))/x
^2
```

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

$$\int \frac{f^{a+b x^{3}}}{x^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)/x**3,x)
```

```
[Out] Integral(f**(a + b*x**3)/x**3, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^(b*x^3 + a)/x^3, x)
```

Mupad [B]
time = 3.58, size = 70, normalized size = 2.06

$$\frac{f^a\,\Gamma\left(\frac{1}{3},-b\,x^3\,\ln\left(f\right)\right)\,{\left(-b\,x^3\,\ln\left(f\right)\right)}^{2/3}}{2\,x^2}-\frac{f^a\,f^{b\,x^3}}{2\,x^2}-\frac{\pi\,\sqrt{3}\,f^a\,{\left(-b\,x^3\,\ln\left(f\right)\right)}^{2/3}}{3\,x^2\,\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)/x^3,x)
```

```
[Out] (f^a*igamma(1/3, -b*x^3*log(f))*(-b*x^3*log(f))^(2/3))/(2*x^2) - (f^a*f^(b*
x^3))/(2*x^2) - (3^(1/2)*f^a*pi*(-b*x^3*log(f))^(2/3))/(3*x^2*gamma(2/3))
```

3.114 $\int e^{4x^3} x^2 \, dx$

Optimal. Leaf size=11

$$\frac{e^{4x^3}}{12}$$

[Out] 1/12*exp(4*x^3)

Rubi [A]
time = 0.01, antiderivative size = 11, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2240}

$$\frac{e^{4x^3}}{12}$$

Antiderivative was successfully verified.

[In] Int[E^(4*x^3)*x^2,x]

[Out] E^(4*x^3)/12

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int e^{4x^3} x^2 \, dx = \frac{e^{4x^3}}{12}$$

Mathematica [A]
time = 0.01, size = 11, normalized size = 1.00

$$\frac{e^{4x^3}}{12}$$

Antiderivative was successfully verified.

[In] Integrate[E^(4*x^3)*x^2,x]

[Out] E^(4*x^3)/12

Maple [A]
time = 0.01, size = 9, normalized size = 0.82

method	result	size
gosper	$\frac{e^{4x^3}}{12}$	9
derivativedivides	$\frac{e^{4x^3}}{12}$	9
default	$\frac{e^{4x^3}}{12}$	9
norman	$\frac{e^{4x^3}}{12}$	9
risch	$\frac{e^{4x^3}}{12}$	9
meijerg	$-\frac{1}{12}+\frac{e^{4x^3}}{12}$	11

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x^3)*x^2,x,method=_RETURNVERBOSE)
[Out] 1/12*exp(4*x^3)
```

Maxima [A]
time = 0.28, size = 8, normalized size = 0.73

$$\frac{1}{12}\,e^{\left(4\,x^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x^3)*x^2,x, algorithm="maxima")
[Out] 1/12*e^(4*x^3)
```

Fricas [A]
time = 0.36, size = 8, normalized size = 0.73

$$\frac{1}{12}\,e^{\left(4\,x^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x^3)*x^2,x, algorithm="fricas")
[Out] 1/12*e^(4*x^3)
```

Sympy [A]
time = 0.03, size = 7, normalized size = 0.64

$$\frac{e^{4x^3}}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x**3)*x**2,x)
```

```
[Out] exp(4*x**3)/12
```

Giac [A]
time = 2.54, size = 8, normalized size = 0.73

$$\frac{1}{12}\,e^{\left(4\,x^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x^3)*x^2,x, algorithm="giac")
```

```
[Out] 1/12*e^(4*x^3)
```

Mupad [B]
time = 0.04, size = 8, normalized size = 0.73

$$\frac{\mathrm{e}^{4\,x^3}}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*exp(4*x^3),x)
```

```
[Out] exp(4*x^3)/12
```

3.115 $\int f^{a+\frac{b}{x}} x^m \, dx$

Optimal. Leaf size=35

$$f^a x^{1+m} \Gamma\left(-1-m, -\frac{b \log(f)}{x}\right) \left(-\frac{b \log(f)}{x}\right)^{1+m}$$

```
[Out] f^a*x^(1+m)*GAMMA(-1-m,-b*ln(f)/x)*(-b*ln(f)/x)^(1+m)
```

Rubi [A]
time = 0.01, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$f^a x^{m+1} \left(-\frac{b \log(f)}{x}\right)^{m+1} \text{Gamma}\left(-m-1, -\frac{b \log(f)}{x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x)*x^m,x]
```

```
[Out] f^a*x^(1 + m)*Gamma[-1 - m, -((b*Log[f])/x)]*(-((b*Log[f])/x))^(1 + m)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x}} x^m \, dx = f^a x^{1+m} \Gamma\left(-1-m, -\frac{b \log(f)}{x}\right) \left(-\frac{b \log(f)}{x}\right)^{1+m}$$

Mathematica [A]
time = 0.01, size = 35, normalized size = 1.00

$$f^a x^{1+m} \Gamma\left(-1-m, -\frac{b \log(f)}{x}\right) \left(-\frac{b \log(f)}{x}\right)^{1+m}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x)*x^m,x]
```

[Out] f^a*x^(1 + m)*Gamma[-1 - m, -((b*Log[f])/x)]*(-((b*Log[f])/x))^(1 + m)

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 135 vs. $2(35) = 70$.
time = 0.04, size = 136, normalized size = 3.89

method	result
meijerg	$f^{a} (-b)^{m} \ln(f)^{1+m} b\left(-\frac{x^{m} (-b)^{-m} \ln(f)^{-m} \Gamma(-m) \left(-\frac{b \ln(f)}{x}\right)^{m}}{1+m}+\frac{x^{1+m} (-b)^{-m} \ln(f)^{-m-1} e^{\frac{b \ln(f)}{x}}}{(1+m) b}+\frac{x^{m} (-b)^{-m} \ln(f\right.$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(f^(a+b/x)*x^m,x,method=_RETURNVERBOSE)

[Out] f^a*(-b)^m*ln(f)^(1+m)*b*(-1/(1+m)*x^m*(-b)^(-m)*ln(f)^(-m)*GAMMA(-m)*(-b*l n(f)/x)^m+1/(1+m)*x^(1+m)*(-b)^(-m)*ln(f)^(-m-1)/b*exp(b*ln(f)/x)+1/(1+m)*x ^m*(-b)^(-m)*ln(f)^(-m)*(-b*ln(f)/x)^m*GAMMA(-m,-b*ln(f)/x))

Maxima [A]
time = 0.06, size = 35, normalized size = 1.00

$$f^{a} x^{m+1} \left(-\frac{b \log(f)}{x}\right)^{m+1} \Gamma\left(-m-1, -\frac{b \log(f)}{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(a+b/x)*x^m,x, algorithm="maxima")

[Out] f^a*x^(m + 1)*(-b*log(f)/x)^(m + 1)*gamma(-m - 1, -b*log(f)/x)

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(a+b/x)*x^m,x, algorithm="fricas")

[Out] integral(f^((a*x + b)/x)*x^m, x)

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

$$\int f^{a+\frac{b}{x}} x^{m}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f**(a+b/x)*x**m,x)

```
[Out] Integral(f**(a + b/x)*x**m, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)*x^m,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x)*x^m, x)
```

Mupad [B]
time = 3.50, size = 52, normalized size = 1.49

$$\frac{f^a\,x^{m+1}\,\mathrm{e}^{\frac{b\,\ln(f)}{2\,x}}\,\mathrm{M}_{\frac{m}{2}+1,-\frac{m}{2}-\frac{1}{2}}\left(\frac{b\,\ln(f)}{x}\right)\,\left(\frac{b\,\ln(f)}{x}\right)^{m/2}}{m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x)*x^m,x)
```

```
[Out] (f^a*x^(m + 1)*exp((b*log(f))/(2*x))*whittakerM(m/2 + 1, - m/2 - 1/2, (b*lo
g(f))/x)*((b*log(f))/x)^(m/2))/(m + 1)
```

3.116 $\int f^{a+\frac{b}{x}}x^4\,dx$

Optimal. Leaf size=22

$$-b^5f^a\Gamma\left(-5,-\frac{b\log(f)}{x}\right)\log^5(f)$$

```
[Out] f^a*x^5*Ei(6,-b*ln(f)/x)
```

Rubi [A]
time = 0.01, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = $\{2250\}$

$$-b^5f^a\log^5(f)\text{Gamma}\left(-5,-\frac{b\log(f)}{x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x)*x^4,x]
```

```
[Out] -(b^5*f^a*Gamma[-5, -((b*Log[f])/x)]*Log[f]^5)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x}}x^4\,dx=-b^5f^a\Gamma\left(-5,-\frac{b\log(f)}{x}\right)\log^5(f)$$

Mathematica [A]
time = 0.00, size = 22, normalized size = 1.00

$$-b^5f^a\Gamma\left(-5,-\frac{b\log(f)}{x}\right)\log^5(f)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x)*x^4,x]
```

```
[Out] -(b^5*f^a*Gamma[-5, -((b*Log[f])/x)]*Log[f]^5)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 120 vs. $2(17) = 34$.
time = 0.07, size = 121, normalized size = 5.50

method	result
risch	$\frac{f^a f^{\frac{b}{x}} x^5}{5} + \frac{b \ln(f) f^a f^{\frac{b}{x}} x^4}{20} + \frac{b^2 \ln(f)^2 f^a f^{\frac{b}{x}} x^3}{60} + \frac{b^3 \ln(f)^3 f^a f^{\frac{b}{x}} x^2}{120} + \frac{b^4 \ln(f)^4 f^a f^{\frac{b}{x}} x}{120} + \frac{b^5 \ln(f)^5 f^a \operatorname{expIntegral}\left(1, -\frac{b \ln(f)}{x}\right)}{120}$
meijerg	$f^a b^5 \ln(f)^5 \left(-\frac{x^5 \left(\frac{137 b^5 \ln(f)^5}{x^5} + \frac{300 b^4 \ln(f)^4}{x^4} + \frac{600 b^3 \ln(f)^3}{x^3} + \frac{1200 b^2 \ln(f)^2}{x^2} + \frac{1800 b \ln(f)}{x} + 1440 \right)}{7200 b^5 \ln(f)^5} + \frac{x^5 \left(\frac{6 b^4 \ln(f)^4}{x^4} + \frac{6 b^3 \ln(f)^3}{x^3} + \cdots \right.}{720 \cdots}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x)*x^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/5*f^a*f^(b/x)*x^5+1/20*b*ln(f)*f^a*f^(b/x)*x^4+1/60*b^2*ln(f)^2*f^a*f^(b/
x)*x^3+1/120*b^3*ln(f)^3*f^a*f^(b/x)*x^2+1/120*b^4*ln(f)^4*f^a*f^(b/x)*x+1/
120*b^5*ln(f)^5*f^a*Ei(1,-b*ln(f)/x)
```

Maxima [A]
time = 0.06, size = 22, normalized size = 1.00

$$-b^5 f^a \Gamma\left(-5, -\frac{b \log(f)}{x}\right) \log(f)^5$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -b^5*f^a*gamma(-5, -b*log(f)/x)*log(f)^5
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 80 vs. $2(17) = 34$.
time = 0.09, size = 80, normalized size = 3.64

$$-\frac{1}{120} b^5 f^a \operatorname{Ei}\left(\frac{b \log(f)}{x}\right) \log(f)^5 + \frac{1}{120} \left(b^4 x \log(f)^4 + b^3 x^2 \log(f)^3 + 2 b^2 x^3 \log(f)^2 + 6 b x^4 \log(f) + 24 x^5\right) f^{\frac{ax+b}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/120*b^5*f^a*Ei(b*log(f)/x)*log(f)^5 + 1/120*(b^4*x*log(f)^4 + b^3*x^2*lo
g(f)^3 + 2*b^2*x^3*log(f)^2 + 6*b*x^4*log(f) + 24*x^5)*f^((a*x + b)/x)
```

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

$$\int f^{a+\frac{b}{x}} x^4 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x)*x**4,x)
```

```
[Out] Integral(f**(a + b/x)*x**4, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^(a + b/x)*x^4, x)
```

Mupad [B]
time = 3.69, size = 99, normalized size = 4.50

$$\frac{b^5 f^a \ln(f)^5 \operatorname{expint}\left(-\frac{b \ln(f)}{x}\right)}{120} + b^5 f^a f^{b/x} \ln(f)^5 \left(\frac{x^2}{120 b^2 \ln(f)^2} + \frac{x^3}{60 b^3 \ln(f)^3} + \frac{x^4}{20 b^4 \ln(f)^4} + \frac{x^5}{5 b^5 \ln(f)^5} + \frac{x}{120 b \ln(f)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x)*x^4,x)
```

```
[Out] (b^5*f^a*log(f)^5*expint(-(b*log(f))/x))/120 + b^5*f^a*f^(b/x)*log(f)^5*(x^
2/(120*b^2*log(f)^2) + x^3/(60*b^3*log(f)^3) + x^4/(20*b^4*log(f)^4) + x^5/
(5*b^5*log(f)^5) + x/(120*b*log(f)))
```

3.117 $\int f^{a+\frac{b}{x}} x^3 \, dx$

Optimal. Leaf size=21

$$b^4 f^a \Gamma\left(-4, -\frac{b \log(f)}{x}\right) \log^4(f)$$

```
[Out] f^a*x^4*Ei(5,-b*ln(f)/x)
```

Rubi [A]
time = 0.02, antiderivative size = 21, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$b^4 f^a \log^4(f) \text{Gamma}\left(-4, -\frac{b \log(f)}{x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x)*x^3,x]
```

```
[Out] b^4*f^a*Gamma[-4, -((b*Log[f])/x)]*Log[f]^4
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x}} x^3 \, dx = b^4 f^a \Gamma\left(-4, -\frac{b \log(f)}{x}\right) \log^4(f)$$

Mathematica [A]
time = 0.00, size = 21, normalized size = 1.00

$$b^4 f^a \Gamma\left(-4, -\frac{b \log(f)}{x}\right) \log^4(f)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x)*x^3,x]
```

```
[Out] b^4*f^a*Gamma[-4, -((b*Log[f])/x)]*Log[f]^4
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 98 vs. $2(17) = 34$.
time = 0.06, size = 99, normalized size = 4.71

method	result
risch	$\frac{f^a f^{\frac{b}{x}} x^4}{4}+\frac{b \ln(f) f^a f^{\frac{b}{x}} x^3}{12}+\frac{b^2 \ln(f)^2 f^a f^{\frac{b}{x}} x^2}{24}+\frac{b^3 \ln(f)^3 f^a f^{\frac{b}{x}} x}{24}+\frac{b^4 \ln(f)^4 f^a \operatorname{expIntegral}\left(1,-\frac{b \ln(f)}{x}\right)}{24}$
meijerg	$-f^a \ln(f)^4 b^4 \left(\frac{x^4\left(\frac{125 b^4 \ln(f)^4}{x^4}+\frac{240 b^3 \ln(f)^3}{x^3}+\frac{360 b^2 \ln(f)^2}{x^2}+\frac{480 b \ln(f)}{x}+360\right)}{1440 b^4 \ln(f)^4}-\frac{x^4\left(\frac{5 b^3 \ln(f)^3}{x^3}+\frac{5 b^2 \ln(f)^2}{x^2}+\frac{10 b \ln(f)}{x}+30\right) e^{\frac{b}{}}}{120 b^4 \ln(f)^4}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x)*x^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/4*f^a*f^(b/x)*x^4+1/12*b*ln(f)*f^a*f^(b/x)*x^3+1/24*b^2*ln(f)^2*f^a*f^(b/
x)*x^2+1/24*b^3*ln(f)^3*f^a*f^(b/x)*x+1/24*b^4*ln(f)^4*f^a*Ei(1,-b*ln(f)/x)
```

Maxima [A]
time = 0.06, size = 21, normalized size = 1.00

$$b^4 f^a \Gamma\left(-4, -\frac{b \log(f)}{x}\right) \log(f)^4$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] b^4*f^a*gamma(-4, -b*log(f)/x)*log(f)^4
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 68 vs. $2(17) = 34$.
time = 0.12, size = 68, normalized size = 3.24

$$-\frac{1}{24} b^4 f^a \mathrm{Ei}\left(\frac{b \log(f)}{x}\right) \log(f)^4 + \frac{1}{24} \left(b^3 x \log(f)^3 + b^2 x^2 \log(f)^2 + 2 b x^3 \log(f) + 6 x^4\right) f^{\frac{ax+b}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/24*b^4*f^a*Ei(b*log(f)/x)*log(f)^4 + 1/24*(b^3*x*log(f)^3 + b^2*x^2*log(
f)^2 + 2*b*x^3*log(f) + 6*x^4)*f^((a*x + b)/x)
```

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

$$\int f^{a+\frac{b}{x}} x^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x)*x**3,x)
```

```
[Out] Integral(f**(a + b/x)*x**3, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^(a + b/x)*x^3, x)
```

Mupad [B]
time = 3.63, size = 87, normalized size = 4.14

$$\frac{b^4\,f^a\ln\left(f\right)^4\,\mathrm{expint}\left(-\frac{b\,\ln(f)}{x}\right)}{24}+b^4\,f^a\,f^{b/x}\ln\left(f\right)^4\left(\frac{x^2}{24\,b^2\ln\left(f\right)^2}+\frac{x^3}{12\,b^3\ln\left(f\right)^3}+\frac{x^4}{4\,b^4\ln\left(f\right)^4}+\frac{x}{24\,b\,\ln\left(f\right)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x)*x^3,x)
```

```
[Out] (b^4*f^a*log(f)^4*expint(-(b*log(f))/x))/24 + b^4*f^a*f^(b/x)*log(f)^4*(x^2
/(24*b^2*log(f)^2) + x^3/(12*b^3*log(f)^3) + x^4/(4*b^4*log(f)^4) + x/(24*b
*log(f)))
```

3.118 $\int f^{a+\frac{b}{x}}x^2\,dx$

Optimal. Leaf size=79

$$\frac{1}{3}f^{a+\frac{b}{x}}x^3+\frac{1}{6}bf^{a+\frac{b}{x}}x^2\log(f)+\frac{1}{6}b^2f^{a+\frac{b}{x}}x\log^2(f)-\frac{1}{6}b^3f^a\mathrm{Ei}\left(\frac{b\log(f)}{x}\right)\log^3(f)$$

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

Rubi [A]
time = 0.04, antiderivative size = 79, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}=0.231$, Rules used = {2245, 2237, 2241}

$$-\frac{1}{6}b^3f^a\log^3(f)\mathrm{Ei}\left(\frac{b\log(f)}{x}\right)+\frac{1}{6}b^2x\log^2(f)f^{a+\frac{b}{x}}+\frac{1}{3}x^3f^{a+\frac{b}{x}}+\frac{1}{6}bx^2\log(f)f^{a+\frac{b}{x}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x)*x^2,x]
```

```
[Out] (f^(a + b/x)*x^3)/3 + (b*f^(a + b/x)*x^2*Log[f])/6 + (b^2*f^(a + b/x)*x*Log
[f]^2)/6 - (b^3*f^a*ExpIntegralEi[(b*Log[f])/x]*Log[f]^3)/6
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int f^{a+\frac{b}{x}}x^2\,dx &= \frac{1}{3}f^{a+\frac{b}{x}}x^3+\frac{1}{3}(b\log(f))\int f^{a+\frac{b}{x}}x\,dx\\ &= \frac{1}{3}f^{a+\frac{b}{x}}x^3+\frac{1}{6}bf^{a+\frac{b}{x}}x^2\log(f)+\frac{1}{6}\left(b^2\log^2(f)\right)\int f^{a+\frac{b}{x}}\,dx\\ &= \frac{1}{3}f^{a+\frac{b}{x}}x^3+\frac{1}{6}bf^{a+\frac{b}{x}}x^2\log(f)+\frac{1}{6}b^2f^{a+\frac{b}{x}}x\log^2(f)+\frac{1}{6}\left(b^3\log^3(f)\right)\int \frac{f^{a+\frac{b}{x}}}{x}\,dx\\ &= \frac{1}{3}f^{a+\frac{b}{x}}x^3+\frac{1}{6}bf^{a+\frac{b}{x}}x^2\log(f)+\frac{1}{6}b^2f^{a+\frac{b}{x}}x\log^2(f)-\frac{1}{6}b^3f^a\mathrm{Ei}\left(\frac{b\log(f)}{x}\right)\log^3(f)\end{aligned}$$

Mathematica [A]
time = 0.02, size = 53, normalized size = 0.67

$$\frac{1}{6}f^a\left(-b^3\mathrm{Ei}\left(\frac{b\log(f)}{x}\right)\log^3(f)+f^{b/x}x\left(2x^2+bx\log(f)+b^2\log^2(f)\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x)*x^2,x]
```

```
[Out] (f^a*(-(b^3*ExpIntegralEi[(b*Log[f])/x]*Log[f]^3) + f^(b/x)*x*(2*x^2 + b*x*
Log[f] + b^2*Log[f]^2)))/6
```

Maple [A]
time = 0.07, size = 77, normalized size = 0.97

method	result
risch	$\frac{f^a f^{\frac{b}{x}} x^3}{3}+\frac{b\ln(f) f^a f^{\frac{b}{x}} x^2}{6}+\frac{b^2\ln(f)^2 f^a f^{\frac{b}{x}} x}{6}+\frac{b^3\ln(f)^3 f^a \operatorname{expIntegral}\left(1,-\frac{b\ln(f)}{x}\right)}{6}$
meijerg	$f^a\ln\left(f\right)^3 b^3\left(-\frac{x^3\left(\frac{22b^3\ln(f)^3}{x^3}+\frac{36b^2\ln(f)^2}{x^2}+\frac{36b\ln(f)}{x}+24\right)}{72b^3\ln(f)^3}+\frac{x^3\left(\frac{4b^2\ln(f)^2}{x^2}+\frac{4b\ln(f)}{x}+8\right)e^{\frac{b\ln(f)}{x}}}{24b^3\ln(f)^3}+\frac{\ln\left(-\frac{b\ln(f)}{x}\right)}{6}+\mathrm{expInt}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x)*x^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*f^a*f^(b/x)*x^3+1/6*b*ln(f)*f^a*f^(b/x)*x^2+1/6*b^2*ln(f)^2*f^a*f^(b/x)
*x+1/6*b^3*ln(f)^3*f^a*Ei(1,-b*ln(f)/x)
```

Maxima [A]
time = 0.32, size = 22, normalized size = 0.28

$$-b^3f^a\Gamma\left(-3,-\frac{b\log\left(f\right)}{x}\right)\log\left(f\right)^3$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -b^3*f^a*gamma(-3, -b*log(f)/x)*log(f)^3
```

Fricas [A]
time = 0.46, size = 56, normalized size = 0.71

$$-\frac{1}{6}\,b^3 f^a \mathrm{Ei}\left(\frac{b\log\left(f\right)}{x}\right)\log\left(f\right)^3+\frac{1}{6}\,\left(b^2 x\log\left(f\right)^2+bx^2\log\left(f\right)+2\,x^3\right)f^{\frac{ax+b}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int f^{a+\frac{b}{x}}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x)*x**2,x)
```

```
[Out] Integral(f**(a + b/x)*x**2, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^(a + b/x)*x^2, x)
```

Mupad [B]
time = 3.60, size = 66, normalized size = 0.84

$$b^3\,f^a\,\ln\left(f\right)^3\,\left(f^{b/x}\,\left(\frac{x^2}{6\,b^2\,\ln\left(f\right)^2}+\frac{x^3}{3\,b^3\,\ln\left(f\right)^3}+\frac{x}{6\,b\,\ln\left(f\right)}\right)+\frac{\mathrm{expint}\left(-\frac{b\,\ln\left(f\right)}{x}\right)}{6}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x)*x^2,x)
```

```
[Out] b^3*f^a*log(f)^3*(f^(b/x)*(x^2/(6*b^2*log(f)^2) + x^3/(3*b^3*log(f)^3) + x/
(6*b*log(f))) + expint(-(b*log(f))/x)/6)
```

3.119 $\int f^{a+\frac{b}{x}} x \, dx$

Optimal. Leaf size=56

$$\frac{1}{2}f^{a+\frac{b}{x}}x^2+\frac{1}{2}bf^{a+\frac{b}{x}}x\log(f)-\frac{1}{2}b^2f^a\text{Ei}\left(\frac{b\log(f)}{x}\right)\log^2(f)$$

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

Rubi [A]
time = 0.03, antiderivative size = 56, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {2245, 2237, 2241}

$$-\frac{1}{2}b^2f^a\log^2(f)\text{Ei}\left(\frac{b\log(f)}{x}\right)+\frac{1}{2}x^2f^{a+\frac{b}{x}}+\frac{1}{2}bx\log(f)f^{a+\frac{b}{x}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x)*x,x]
```

```
[Out] (f^(a + b/x)*x^2)/2 + (b*f^(a + b/x)*x*Log[f])/2 - (b^2*f^a*ExpIntegralEi[(
b*Log[f])/x]*Log[f]^2)/2
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$
\begin{aligned}
\int f^{a+\frac{b}{x}}x\,dx &= \frac{1}{2}f^{a+\frac{b}{x}}x^2+\frac{1}{2}(b\log(f))\int f^{a+\frac{b}{x}}\,dx\\
&= \frac{1}{2}f^{a+\frac{b}{x}}x^2+\frac{1}{2}bf^{a+\frac{b}{x}}x\log(f)+\frac{1}{2}\left(b^2\log^2(f)\right)\int \frac{f^{a+\frac{b}{x}}}{x}\,dx\\
&= \frac{1}{2}f^{a+\frac{b}{x}}x^2+\frac{1}{2}bf^{a+\frac{b}{x}}x\log(f)-\frac{1}{2}b^2f^a\mathrm{Ei}\left(\frac{b\log(f)}{x}\right)\log^2(f)
\end{aligned}
$$

Mathematica [A]
time = 0.01, size = 40, normalized size = 0.71

$$\frac{1}{2}f^a\left(-b^2\mathrm{Ei}\left(\frac{b\log(f)}{x}\right)\log^2(f)+f^{b/x}x(x+b\log(f))\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x)*x,x]
```

```
[Out] (f^a*(-(b^2*ExpIntegralEi[(b*Log[f])/x]*Log[f]^2) + f^(b/x)*x*(x + b*Log[f]
)))/2
```

Maple [A]
time = 0.07, size = 55, normalized size = 0.98

method	result
risch	$\frac{f^a f^{\frac{b}{x}} x^2}{2}+\frac{b\ln(f) f^a f^{\frac{b}{x}} x}{2}+\frac{b^2\ln(f)^2 f^a \,\mathrm{expIntegral}\left(1,-\frac{b\ln(f)}{x}\right)}{2}$
meijerg	$-f^a b^2\ln(f)^2\left(\frac{x^2\left(\frac{9b^2\ln(f)^2}{x^2}+\frac{12b\ln(f)}{x}+6\right)}{12b^2\ln(f)^2}-\frac{x^2\left(3+\frac{3b\ln(f)}{x}\right)\mathrm{e}^{\frac{b\ln(f)}{x}}}{6b^2\ln(f)^2}-\frac{\ln\left(-\frac{b\ln(f)}{x}\right)}{2}-\frac{\mathrm{expIntegral}\left(1,-\frac{b\ln(f)}{x}\right)}{2}-\frac{3}{4}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x)*x,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*f^a*f^(b/x)*x^2+1/2*b*ln(f)*f^a*f^(b/x)*x+1/2*b^2*ln(f)^2*f^a*Ei(1,-b*l
n(f)/x)
```

Maxima [A]
time = 0.32, size = 21, normalized size = 0.38

$$b^2f^a\Gamma\left(-2,-\frac{b\log(f)}{x}\right)\log(f)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)*x,x, algorithm="maxima")
```

```
[Out] b^2*f^a*gamma(-2, -b*log(f)/x)*log(f)^2
```

Fricas [A]
time = 0.37, size = 43, normalized size = 0.77

$$-\frac{1}{2}b^{2}f^{a}\mathrm{Ei}\left(\frac{b\log\left(f\right)}{x}\right)\log\left(f\right)^{2}+\frac{1}{2}\left(bx\log\left(f\right)+x^{2}\right)f^{\frac{ax+b}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)*x,x, algorithm="fricas")
```

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

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

$$\int f^{a+\frac{b}{x}}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x)*x,x)
```

```
[Out] Integral(f**(a + b/x)*x, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)*x,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x)*x, x)
```

Mupad [B]
time = 3.64, size = 54, normalized size = 0.96

$$b^{2}f^{a}\ln\left(f\right)^{2}\left(f^{b/x}\left(\frac{x^{2}}{2b^{2}\ln\left(f\right)^{2}}+\frac{x}{2b\ln\left(f\right)}\right)+\frac{\mathrm{expint}\left(-\frac{b\ln(f)}{x}\right)}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x)*x,x)
```

```
[Out] b^2*f^a*log(f)^2*(f^(b/x)*(x^2/(2*b^2*log(f)^2) + x/(2*b*log(f))) + expint(
-(b*log(f))/x)/2)
```

3.120 $\int f^{a+\frac{b}{x}}\,dx$

Optimal. Leaf size=28

$$f^{a+\frac{b}{x}}x - bf^a\text{Ei}\left(\frac{b\log(f)}{x}\right)\log(f)$$

```
[Out] f^(a+b/x)*x-b*f^a*Ei(b*ln(f)/x)*ln(f)
```

Rubi [A]
time = 0.02, antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {2237, 2241}

$$xf^{a+\frac{b}{x}} - bf^a\log(f)\text{Ei}\left(\frac{b\log(f)}{x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x),x]
```

```
[Out] f^(a + b/x)*x - b*f^a*ExpIntegralEi[(b*Log[f])/x]*Log[f]
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c + d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a + b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && ILtQ[n, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\begin{aligned}\int f^{a+\frac{b}{x}}\,dx &= f^{a+\frac{b}{x}}x + (b\log(f))\int \frac{f^{a+\frac{b}{x}}}{x}\,dx\\ &= f^{a+\frac{b}{x}}x - bf^a\text{Ei}\left(\frac{b\log(f)}{x}\right)\log(f)\end{aligned}$$

Mathematica [A]
time = 0.01, size = 28, normalized size = 1.00

$$f^{a+\frac{b}{x}}x - bf^a\text{Ei}\left(\frac{b\log(f)}{x}\right)\log(f)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x),x]
```

```
[Out] f^(a + b/x)*x - b*f^a*ExpIntegralEi[(b*Log[f])/x]*Log[f]
```

Maple [A]
time = 0.06, size = 31, normalized size = 1.11

method	result
risch	$b\ln(f)\, f^{a}\, \mathrm{expIntegral}\left(1,-\frac{b\ln(f)}{x}\right)+f^{a} f^{\frac{b}{x}} x$
meijerg	$f^{a} b\ln(f) \Big(-\frac{x\left(2+\frac{2b\ln(f)}{x}\right)}{2b\ln(f)}+\frac{x\, \mathrm{e}^{\frac{b\ln(f)}{x}}}{b\ln(f)}+\ln\left(-\frac{b\ln(f)}{x}\right)+\mathrm{expIntegral}\left(1,-\frac{b\ln(f)}{x}\right)+1+\ln(x)-\ln(-$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x),x,method=_RETURNVERBOSE)
```

```
[Out] b*ln(f)*f^a*Ei(1,-b*ln(f)/x)+f^a*f^(b/x)*x
```

Maxima [A]
time = 0.32, size = 18, normalized size = 0.64

$$-bf^{a}\Gamma\left(-1,-\frac{b\log(f)}{x}\right)\log(f)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x),x, algorithm="maxima")
```

```
[Out] -b*f^a*gamma(-1, -b*log(f)/x)*log(f)
```

Fricas [A]
time = 0.39, size = 30, normalized size = 1.07

$$-bf^{a}\mathrm{Ei}\left(\frac{b\log(f)}{x}\right)\log(f)+f^{\frac{ax+b}{x}}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x),x, algorithm="fricas")
```

```
[Out] -b*f^a*Ei(b*log(f)/x)*log(f) + f^((a*x + b)/x)*x
```

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

$$\int f^{a+\frac{b}{x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x),x)
```

```
[Out] Integral(f**(a + b/x), x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x),x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x), x)
```

Mupad [B]
time = 3.60, size = 27, normalized size = 0.96

$$f^a\left(f^{b/x}\,x+b\,\ln\left(f\right)\,\mathrm{expint}\left(-\frac{b\,\ln\left(f\right)}{x}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x),x)
```

```
[Out] f^a*(f^(b/x)*x + b*log(f)*expint(-(b*log(f))/x))
```

3.121 $\int \frac{f^{a+\frac{b}{x}}}{x} dx$

Optimal. Leaf size=13

$$-f^a \text{Ei}\left(\frac{b\log(f)}{x}\right)$$

[Out] -f^a*Ei(b*ln(f)/x)

Rubi [A]
time = 0.01, antiderivative size = 13, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2241}

$$-f^a \text{Ei}\left(\frac{b\log(f)}{x}\right)$$

Antiderivative was successfully verified.

[In] Int[f^(a + b/x)/x,x]

[Out] -(f^a*ExpIntegralEi[(b*Log[f])/x])

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x}}}{x} dx = -f^a \text{Ei}\left(\frac{b\log(f)}{x}\right)$$

Mathematica [A]
time = 0.00, size = 13, normalized size = 1.00

$$-f^a \text{Ei}\left(\frac{b\log(f)}{x}\right)$$

Antiderivative was successfully verified.

[In] Integrate[f^(a + b/x)/x,x]

[Out] -(f^a*ExpIntegralEi[(b*Log[f])/x])

Maple [A]
time = 0.06, size = 15, normalized size = 1.15

method	result	size
risch	$f^{a}\operatorname{expIntegral}\left(1,-\frac{b\ln\left(f\right)}{x}\right)$	15
meijerg	$-f^{a}\left(-\ln\left(-\frac{b\ln\left(f\right)}{x}\right)-\operatorname{expIntegral}\left(1,-\frac{b\ln\left(f\right)}{x}\right)-\ln\left(x\right)+\ln\left(-b\right)+\ln\left(\ln\left(f\right)\right)\right)$	41

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x)/x,x,method=_RETURNVERBOSE)
[Out] f^a*Ei(1,-b*ln(f)/x)
```

Maxima [A]
time = 0.32, size = 13, normalized size = 1.00

$$-f^{a}\operatorname{Ei}\left(\frac{b\log\left(f\right)}{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x,x, algorithm="maxima")
[Out] -f^a*Ei(b*log(f)/x)
```

Fricas [A]
time = 0.36, size = 13, normalized size = 1.00

$$-f^{a}\operatorname{Ei}\left(\frac{b\log\left(f\right)}{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x,x, algorithm="fricas")
[Out] -f^a*Ei(b*log(f)/x)
```

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

$$\int \frac{f^{a+\frac{b}{x}}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x)/x,x)
[Out] Integral(f**(a + b/x)/x, x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x)/x, x)
```

Mupad [**B**]
time = 3.49, size = 13, normalized size = 1.00

$$-f^a\,\mathrm{ei}\left(\frac{b\,\ln\left(f\right)}{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x)/x,x)
```

```
[Out] -f^a*ei((b*log(f))/x)
```

3.122 $\int \frac{f^{a+\frac{b}{x}}}{x^2}\,dx$

Optimal. Leaf size=18

$$-\frac{f^{a+\frac{b}{x}}}{b\log(f)}$$

```
[Out] -f^(a+b/x)/b/ln(f)
```

Rubi [A]
time = 0.01, antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2240}

$$-\frac{f^{a+\frac{b}{x}}}{b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x)/x^2,x]
```

```
[Out] -(f^(a + b/x)/(b*Log[f]))
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x}}}{x^2}\,dx = -\frac{f^{a+\frac{b}{x}}}{b\log(f)}$$

Mathematica [A]
time = 0.00, size = 18, normalized size = 1.00

$$-\frac{f^{a+\frac{b}{x}}}{b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x)/x^2,x]
```

```
[Out] -(f^(a + b/x)/(b*Log[f]))
```

Maple [A]
time = 0.01, size = 19, normalized size = 1.06

method	result	size
derivativedivides	$-\frac{f^{a+\frac{b}{x}}}{b\ln(f)}$	19
default	$-\frac{f^{a+\frac{b}{x}}}{b\ln(f)}$	19
norman	$-\frac{e^{\left(a+\frac{b}{x}\right)\ln(f)}}{\ln(f)b}$	21
risch	$-\frac{f^{\frac{ax+b}{x}}}{\ln(f)b}$	21
meijerg	$\frac{f^{a}\left(1-e^{\frac{b\ln(f)}{x}}\right)}{\ln(f)b}$	24

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x)/x^2,x,method=_RETURNVERBOSE)
[Out] -f^(a+b/x)/b/ln(f)
```

Maxima [A]
time = 0.28, size = 18, normalized size = 1.00

$$-\frac{f^{a+\frac{b}{x}}}{b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^2,x, algorithm="maxima")
[Out] -f^(a + b/x)/(b*log(f))
```

Fricas [A]
time = 0.36, size = 20, normalized size = 1.11

$$-\frac{f^{\frac{ax+b}{x}}}{b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^2,x, algorithm="fricas")
[Out] -f^((a*x + b)/x)/(b*log(f))
```

Sympy [**A**]
time = 0.04, size = 20, normalized size = 1.11

$$\begin{cases} -\frac{f^{a+\frac{b}{x}}}{b\log(f)} & \text{for } b\log(f) \neq 0 \\ -\frac{1}{x} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x)/x**2,x)
```

```
[Out] Piecewise((-f**(a + b/x)/(b*log(f)), Ne(b*log(f), 0)), (-1/x, True))
```

Giac [**A**]
time = 3.33, size = 20, normalized size = 1.11

$$-\frac{f^{\frac{ax+b}{x}}}{b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^2,x, algorithm="giac")
```

```
[Out] -f^((a*x + b)/x)/(b*log(f))
```

Mupad [**B**]
time = 3.52, size = 18, normalized size = 1.00

$$-\frac{f^{a+\frac{b}{x}}}{b\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x)/x^2,x)
```

```
[Out] -f^(a + b/x)/(b*log(f))
```

3.123 $\int \frac{f^{a+\frac{b}{x}}}{x^3}\,dx$

Optimal. Leaf size=39

$$\frac{f^{a+\frac{b}{x}}}{b^2\log^2(f)}-\frac{f^{a+\frac{b}{x}}}{bx\log(f)}$$

```
[Out] f^(a+b/x)/b^2/ln(f)^2-f^(a+b/x)/b/x/ln(f)
```

Rubi [A]
time = 0.02, antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}=0.154$, Rules used = {2243, 2240}

$$\frac{f^{a+\frac{b}{x}}}{b^2\log^2(f)}-\frac{f^{a+\frac{b}{x}}}{bx\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x)/x^3,x]
```

```
[Out] f^(a + b/x)/(b^2*Log[f]^2) - f^(a + b/x)/(b*x*Log[f])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\begin{aligned}\int \frac{f^{a+\frac{b}{x}}}{x^3}\,dx &= -\frac{f^{a+\frac{b}{x}}}{bx\log(f)}-\frac{\int \frac{f^{a+\frac{b}{x}}}{x^2}\,dx}{b\log(f)}\\ &= \frac{f^{a+\frac{b}{x}}}{b^2\log^2(f)}-\frac{f^{a+\frac{b}{x}}}{bx\log(f)}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 27, normalized size = 0.69

$$\frac{f^{a+\frac{b}{x}}(x-b\log(f))}{b^2x\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x)/x^3,x]
```

```
[Out] (f^(a + b/x)*(x - b*Log[f]))/(b^2*x*Log[f]^2)
```

Maple [A]
time = 0.02, size = 32, normalized size = 0.82

method	result	size
risch	$-\frac{(b\ln(f)-x)f^{\frac{ax+b}{x}}}{\ln(f)^2 b^2 x}$	32
meijerg	$-\frac{f^a\left(1-\frac{\left(2-\frac{2b\ln(f)}{x}\right)e^{\frac{b\ln(f)}{x}}}{2}\right)}{\ln(f)^2 b^2}$	35
norman	$\frac{\frac{x^2 e^{\left(a+\frac{b}{x}\right)\ln(f)}}{b^2\ln(f)^2}-\frac{x\,e^{\left(a+\frac{b}{x}\right)\ln(f)}}{\ln(f)b}}{x^2}$	49

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x)/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] -(b*ln(f)-x)/ln(f)^2/b^2/x*f^((a*x+b)/x)
```

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 0.32, size = 21, normalized size = 0.54

$$\frac{f^a\Gamma\left(2,-\frac{b\log(f)}{x}\right)}{b^2\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^3,x, algorithm="maxima")
```

```
[Out] f^a*gamma(2, -b*log(f)/x)/(b^2*log(f)^2)
```

Fricas [A]
time = 0.44, size = 31, normalized size = 0.79

$$-\frac{(b\log(f)-x)f^{\frac{ax+b}{x}}}{b^2x\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^3,x, algorithm="fricas")
```

```
[Out] -(b*log(f) - x)*f^((a*x + b)/x)/(b^2*x*log(f)^2)
```

Sympy [A]
time = 0.04, size = 22, normalized size = 0.56

$$\frac{f^{a+\frac{b}{x}}(-b\log{(f)}+x)}{b^2x\log{(f)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x)/x**3,x)
```

```
[Out] f**(a + b/x)*(-b*log(f) + x)/(b**2*x*log(f)**2)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^3,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x)/x^3, x)
```

Mupad [B]
time = 3.55, size = 27, normalized size = 0.69

$$\frac{f^{a+\frac{b}{x}}\,(x-b\,\ln{(f)})}{b^2\,x\ln{(f)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x)/x^3,x)
```

```
[Out] (f^(a + b/x)*(x - b*log(f)))/(b^2*x*log(f)^2)
```

3.124 $\int \frac{f^{a+\frac{b}{x}}}{x^4} dx$

Optimal. Leaf size=61

$$-\frac{2f^{a+\frac{b}{x}}}{b^3 \log^3(f)}+\frac{2f^{a+\frac{b}{x}}}{b^2 x \log^2(f)}-\frac{f^{a+\frac{b}{x}}}{b x^2 \log(f)}$$

```
[Out] -2*f^(a+b/x)/b^3/ln(f)^3+2*f^(a+b/x)/b^2/x/ln(f)^2-f^(a+b/x)/b/x^2/ln(f)
```

Rubi [A]
time = 0.04, antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2243, 2240}

$$-\frac{2f^{a+\frac{b}{x}}}{b^3 \log^3(f)}+\frac{2f^{a+\frac{b}{x}}}{b^2 x \log^2(f)}-\frac{f^{a+\frac{b}{x}}}{b x^2 \log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x)/x^4,x]
```

```
[Out] (-2*f^(a + b/x))/(b^3*Log[f]^3) + (2*f^(a + b/x))/(b^2*x*Log[f]^2) - f^(a +
 b/x)/(b*x^2*Log[f])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x}}}{x^4}\,dx = -\frac{f^{a+\frac{b}{x}}}{bx^2\log(f)} - \frac{2\int \frac{f^{a+\frac{b}{x}}}{x^3}\,dx}{b\log(f)}$$
$$= \frac{2f^{a+\frac{b}{x}}}{b^2x\log^2(f)} - \frac{f^{a+\frac{b}{x}}}{bx^2\log(f)} + \frac{2\int \frac{f^{a+\frac{b}{x}}}{x^2}\,dx}{b^2\log^2(f)}$$
$$= -\frac{2f^{a+\frac{b}{x}}}{b^3\log^3(f)} + \frac{2f^{a+\frac{b}{x}}}{b^2x\log^2(f)} - \frac{f^{a+\frac{b}{x}}}{bx^2\log(f)}$$

Mathematica [A]
time = 0.01, size = 41, normalized size = 0.67

$$-\frac{f^{a+\frac{b}{x}}\left(2x^2-2bx\log(f)+b^2\log^2(f)\right)}{b^3x^2\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x)/x^4,x]
[Out] -((f^(a + b/x)*(2*x^2 - 2*b*x*Log[f] + b^2*Log[f]^2))/(b^3*x^2*Log[f]^3))
```

Maple [A]
time = 0.02, size = 44, normalized size = 0.72

method	result	size
risch	$-\frac{\left(\ln(f)^2b^2-2\ln(f)bx+2x^2\right)f^{\frac{ax+b}{x}}}{\ln(f)^3b^3x^2}$	44
meijerg	$\frac{f^a\left(2-\frac{\left(\frac{3b^2\ln(f)^2}{x^2}-\frac{6b\ln(f)}{x}+6\right)e^{\frac{b\ln(f)}{x}}}{3}\right)}{\ln(f)^3b^3}$	46
norman	$\frac{-\frac{x\,e^{\left(a+\frac{b}{x}\right)\ln(f)}}{\ln(f)b}+\frac{2x^2e^{\left(a+\frac{b}{x}\right)\ln(f)}}{b^2\ln(f)^2}-\frac{2x^3e^{\left(a+\frac{b}{x}\right)\ln(f)}}{b^3\ln(f)^3}}{x^3}$	73

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x)/x^4,x,method=_RETURNVERBOSE)
[Out] -(ln(f)^2*b^2-2*ln(f)*b*x+2*x^2)/ln(f)^3/b^3/x^2*f^((a*x+b)/x)
```

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 0.32, size = 22, normalized size = 0.36

$$-\frac{f^a\Gamma\left(3,-\frac{b\log(f)}{x}\right)}{b^3\log\left(f\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^4,x, algorithm="maxima")
```

```
[Out] -f^a*gamma(3, -b*log(f)/x)/(b^3*log(f)^3)
```

Fricas [A]
time = 0.45, size = 43, normalized size = 0.70

$$-\frac{\left(b^2\log\left(f\right)^2-2\,bx\log\left(f\right)+2\,x^2\right)f^{\frac{ax+b}{x}}}{b^3x^2\log\left(f\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^4,x, algorithm="fricas")
```

```
[Out] -(b^2*log(f)^2 - 2*b*x*log(f) + 2*x^2)*f^((a*x + b)/x)/(b^3*x^2*log(f)^3)
```

Sympy [A]
time = 0.05, size = 39, normalized size = 0.64

$$\frac{f^{a+\frac{b}{x}}\left(-b^2\log\left(f\right)^2+2bx\log\left(f\right)-2x^2\right)}{b^3x^2\log\left(f\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x)/x**4,x)
```

```
[Out] f**(a + b/x)*(-b**2*log(f)**2 + 2*b*x*log(f) - 2*x**2)/(b**3*x**2*log(f)**3
)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^4,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x)/x^4, x)
```

Mupad [B]
time = 3.55, size = 45, normalized size = 0.74

$$-\frac{f^{a+\frac{b}{x}}\,\left(\frac{1}{b\,\ln\left(f\right)}+\frac{2\,x^2}{b^3\,{\ln\left(f\right)}^3}-\frac{2\,x}{b^2\,{\ln\left(f\right)}^2}\right)}{x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x)/x^4,x)
```

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

3.125 $\int \frac{f^{a+\frac{b}{x}}}{x^5}\,dx$

Optimal. Leaf size=82

$$\frac{6f^{a+\frac{b}{x}}}{b^4\log^4(f)}-\frac{6f^{a+\frac{b}{x}}}{b^3x\log^3(f)}+\frac{3f^{a+\frac{b}{x}}}{b^2x^2\log^2(f)}-\frac{f^{a+\frac{b}{x}}}{bx^3\log(f)}$$

```
[Out] 6*f^(a+b/x)/b^4/ln(f)^4-6*f^(a+b/x)/b^3/x/ln(f)^3+3*f^(a+b/x)/b^2/x^2/ln(f)
^2-f^(a+b/x)/b/x^3/ln(f)
```

Rubi [A]
time = 0.06, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2243, 2240}

$$\frac{6f^{a+\frac{b}{x}}}{b^4\log^4(f)}-\frac{6f^{a+\frac{b}{x}}}{b^3x\log^3(f)}+\frac{3f^{a+\frac{b}{x}}}{b^2x^2\log^2(f)}-\frac{f^{a+\frac{b}{x}}}{bx^3\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x)/x^5,x]
```

```
[Out] (6*f^(a + b/x))/(b^4*Log[f]^4) - (6*f^(a + b/x))/(b^3*x*Log[f]^3) + (3*f^(a
 + b/x))/(b^2*x^2*Log[f]^2) - f^(a + b/x)/(b*x^3*Log[f])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x}}}{x^5}\,dx = -\frac{f^{a+\frac{b}{x}}}{bx^3\log(f)} - \frac{3\int \frac{f^{a+\frac{b}{x}}}{x^4}\,dx}{b\log(f)}$$
$$= \frac{3f^{a+\frac{b}{x}}}{b^2x^2\log^2(f)} - \frac{f^{a+\frac{b}{x}}}{bx^3\log(f)} + \frac{6\int \frac{f^{a+\frac{b}{x}}}{x^3}\,dx}{b^2\log^2(f)}$$
$$= -\frac{6f^{a+\frac{b}{x}}}{b^3x\log^3(f)} + \frac{3f^{a+\frac{b}{x}}}{b^2x^2\log^2(f)} - \frac{f^{a+\frac{b}{x}}}{bx^3\log(f)} - \frac{6\int \frac{f^{a+\frac{b}{x}}}{x^2}\,dx}{b^3\log^3(f)}$$
$$= \frac{6f^{a+\frac{b}{x}}}{b^4\log^4(f)} - \frac{6f^{a+\frac{b}{x}}}{b^3x\log^3(f)} + \frac{3f^{a+\frac{b}{x}}}{b^2x^2\log^2(f)} - \frac{f^{a+\frac{b}{x}}}{bx^3\log(f)}$$

Mathematica [A]
time = 0.01, size = 53, normalized size = 0.65

$$\frac{f^{a+\frac{b}{x}}\left(6x^3-6bx^2\log(f)+3b^2x\log^2(f)-b^3\log^3(f)\right)}{b^4x^3\log^4(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x)/x^5,x]
[Out] (f^(a + b/x)*(6*x^3 - 6*b*x^2*Log[f] + 3*b^2*x*Log[f]^2 - b^3*Log[f]^3))/(b
^4*x^3*Log[f]^4)
```

Maple [A]
time = 0.02, size = 56, normalized size = 0.68

method	result	size
risch	$-\frac{\left(\ln(f)^3b^3-3\ln(f)^2b^2x+6b\,x^2\ln(f)-6x^3\right)f^{\frac{ax+b}{x}}}{\ln(f)^4b^4x^3}$	56
meijerg	$-\frac{f^a\left(6-\frac{\left(-\frac{4b^3\ln(f)^3}{x^3}+\frac{12b^2\ln(f)^2}{x^2}-\frac{24b\ln(f)}{x}+24\right)e^{\frac{b\ln(f)}{x}}}{4}\right)}{b^4\ln(f)^4}$	59
norman	$\frac{-\frac{x\,e^{\left(a+\frac{b}{x}\right)\ln(f)}}{\ln(f)b}+\frac{3x^2e^{\left(a+\frac{b}{x}\right)\ln(f)}}{b^2\ln(f)^2}-\frac{6x^3e^{\left(a+\frac{b}{x}\right)\ln(f)}}{b^3\ln(f)^3}+\frac{6x^4e^{\left(a+\frac{b}{x}\right)\ln(f)}}{b^4\ln(f)^4}}{x^4}$	96

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x)/x^5,x,method=_RETURNVERBOSE)
[Out] -(ln(f)^3*b^3-3*ln(f)^2*b^2*x+6*b*x^2*ln(f)-6*x^3)/ln(f)^4/b^4/x^3*f^((a*x+
b)/x)
```

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 0.32, size = 21, normalized size = 0.26

$$\frac{f^a\Gamma\left(4,-\frac{b\log(f)}{x}\right)}{b^4\log{(f)}^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^5,x, algorithm="maxima")
```

```
[Out] f^a*gamma(4, -b*log(f)/x)/(b^4*log(f)^4)
```

Fricas [A]
time = 0.43, size = 55, normalized size = 0.67

$$-\frac{\left(b^3\log{(f)}^3-3\,b^2x\log{(f)}^2+6\,bx^2\log{(f)}-6\,x^3\right)f^{\frac{ax+b}{x}}}{b^4x^3\log{(f)}^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^5,x, algorithm="fricas")
```

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

Sympy [A]
time = 0.05, size = 53, normalized size = 0.65

$$\frac{f^{a+\frac{b}{x}}\left(-b^3\log{(f)}^3+3b^2x\log{(f)}^2-6bx^2\log{(f)}+6x^3\right)}{b^4x^3\log{(f)}^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x)/x**5,x)
```

```
[Out] f**(a + b/x)*(-b**3*log(f)**3 + 3*b**2*x*log(f)**2 - 6*b*x**2*log(f) + 6*x*
*3)/(b**4*x**3*log(f)**4)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^5,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x)/x^5, x)
```

Mupad [B]
time = 3.55, size = 57, normalized size = 0.70

$$-\frac{f^{a+\frac{b}{x}}\left(\frac{1}{b\ln(f)}+\frac{6x^2}{b^3\ln(f)^3}-\frac{6x^3}{b^4\ln(f)^4}-\frac{3x}{b^2\ln(f)^2}\right)}{x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x)/x^5,x)
```

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

3.126 $\int \frac{f^{a+\frac{b}{x}}}{x^6}\,dx$

Optimal. Leaf size=65

$$-\frac{f^{a+\frac{b}{x}}\left(24x^4-24bx^3\log(f)+12b^2x^2\log^2(f)-4b^3x\log^3(f)+b^4\log^4(f)\right)}{b^5x^4\log^5(f)}$$

```
[Out] -f^(a+b/x)*(24*x^4-24*b*x^3*ln(f)+12*b^2*x^2*ln(f)^2-4*b^3*x*ln(f)^3+b^4*ln
(f)^4)/b^5/x^4/ln(f)^5
```

Rubi [A]
time = 0.02, antiderivative size = 65, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2249}

$$-\frac{f^{a+\frac{b}{x}}\left(b^4\log^4(f)-4b^3x\log^3(f)+12b^2x^2\log^2(f)-24bx^3\log(f)+24x^4\right)}{b^5x^4\log^5(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x)/x^6,x]
```

```
[Out] -((f^(a + b/x)*(24*x^4 - 24*b*x^3*Log[f] + 12*b^2*x^2*Log[f]^2 - 4*b^3*x*Lo
g[f]^3 + b^4*Log[f]^4))/(b^5*x^4*Log[f]^5))
```

Rule 2249

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> With[{p = Simplify[(m + 1)/n]}, Simp[(-F^a)*((f/d)^m/(d*n*
((-b)*Log[F])^p))*Simplify[FunctionExpand[Gamma[p, (-b)*(c + d*x)^n*Log[F]]
]], x] /; IGtQ[p, 0]] /; FreeQ[{F, a, b, c, d, e, f, m, n}, x] && EqQ[d*e -
 c*f, 0] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x}}}{x^6}\,dx=-\frac{f^a\Gamma\left(5,-\frac{b\log(f)}{x}\right)}{b^5\log^5(f)}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.00, size = 22, normalized size = 0.34

$$-\frac{f^a\Gamma\left(5,-\frac{b\log(f)}{x}\right)}{b^5\log^5(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x)/x^6,x]
```

```
[Out] -((f^a*Gamma[5, -((b*Log[f])/x)])/(b^5*Log[f]^5))
```

Maple [A]
time = 0.03, size = 68, normalized size = 1.05

method	result	size
risch	$-\frac{\left(24 x^{4}-24 b\,x^{3} \ln \left(f \right)+12 b^{2} x^{2} \ln \left(f \right)^{2}-4 b^{3} x \ln \left(f \right)^{3}+b^{4} \ln \left(f \right)^{4}\right) f^{\frac{a x +b}{x}}}{b^{5} \ln \left(f \right)^{5} x^{4}}$	68
meijerg	$\frac{f^{a} \left(24-\frac{\left(\frac{5 b^{4} \ln \left(f \right)^{4}}{x^{4}}-\frac{20 b^{3} \ln \left(f \right)^{3}}{x^{3}}+\frac{60 b^{2} \ln \left(f \right)^{2}}{x^{2}}-\frac{120 b \ln \left(f \right)}{x}+120\right) {\mathrm e}^{\frac{b \ln \left(f \right)}{x}}}{5}\right)}{b^{5} \ln \left(f \right)^{5}}$	70
norman	$\frac{-\frac{x \,{\mathrm e}^{\left(a +\frac{b}{x}\right) \ln \left(f \right)}}{\ln \left(f \right) b}+\frac{4 x^{2} {\mathrm e}^{\left(a +\frac{b}{x}\right) \ln \left(f \right)}}{b^{2} \ln \left(f \right)^{2}}-\frac{12 x^{3} {\mathrm e}^{\left(a +\frac{b}{x}\right) \ln \left(f \right)}}{b^{3} \ln \left(f \right)^{3}}+\frac{24 x^{4} {\mathrm e}^{\left(a +\frac{b}{x}\right) \ln \left(f \right)}}{b^{4} \ln \left(f \right)^{4}}-\frac{24 x^{5} {\mathrm e}^{\left(a +\frac{b}{x}\right) \ln \left(f \right)}}{b^{5} \ln \left(f \right)^{5}}}{x^{5}}$	119

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x)/x^6,x,method=_RETURNVERBOSE)
```

```
[Out] -(24*x^4-24*b*x^3*ln(f)+12*b^2*x^2*ln(f)^2-4*b^3*x*ln(f)^3+b^4*ln(f)^4)/b^5
/ln(f)^5/x^4*f^((a*x+b)/x)
```

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 0.32, size = 22, normalized size = 0.34

$$-\frac{f^{a}\Gamma\left(5,-\frac{b\log\left(f\right)}{x}\right)}{b^{5}\log\left(f\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^6,x, algorithm="maxima")
```

```
[Out] -f^a*gamma(5, -b*log(f)/x)/(b^5*log(f)^5)
```

Fricas [A]
time = 0.36, size = 67, normalized size = 1.03

$$-\frac{\left(b^{4}\log\left(f\right)^{4}-4\,b^{3}x\log\left(f\right)^{3}+12\,b^{2}x^{2}\log\left(f\right)^{2}-24\,bx^{3}\log\left(f\right)+24\,x^{4}\right)f^{\frac{ax+b}{x}}}{b^{5}x^{4}\log\left(f\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^6,x, algorithm="fricas")
```

```
[Out] -(b^4*log(f)^4 - 4*b^3*x*log(f)^3 + 12*b^2*x^2*log(f)^2 - 24*b*x^3*log(f) +
 24*x^4)*f^((a*x + b)/x)/(b^5*x^4*log(f)^5)
```

Sympy [A]
time = 0.05, size = 66, normalized size = 1.02

$$\frac{f^{a+\frac{b}{x}} \left(-b^4 \log{(f)}^4 + 4b^3 x \log{(f)}^3 - 12b^2 x^2 \log{(f)}^2 + 24b x^3 \log{(f)} - 24x^4\right)}{b^5 x^4 \log{(f)}^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x)/x**6,x)
```

```
[Out] f**(a + b/x)*(-b**4*log(f)**4 + 4*b**3*x*log(f)**3 - 12*b**2*x**2*log(f)**2
 + 24*b*x**3*log(f) - 24*x**4)/(b**5*x**4*log(f)**5)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^6,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x)/x^6, x)
```

Mupad [B]
time = 3.60, size = 69, normalized size = 1.06

$$-\frac{f^{a+\frac{b}{x}} \left(\frac{1}{b\,\ln(f)} + \frac{12\,x^2}{b^3\,\ln(f)^3} - \frac{24\,x^3}{b^4\,\ln(f)^4} + \frac{24\,x^4}{b^5\,\ln(f)^5} - \frac{4\,x}{b^2\,\ln(f)^2}\right)}{x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x)/x^6,x)
```

```
[Out] -(f^(a + b/x)*(1/(b*log(f)) + (12*x^2)/(b^3*log(f)^3) - (24*x^3)/(b^4*log(f
)^4) + (24*x^4)/(b^5*log(f)^5) - (4*x)/(b^2*log(f)^2)))/x^4
```

3.127 $\int \frac{f^{a+\frac{b}{x}}}{x^7} dx$

Optimal. Leaf size=77

$$\frac{f^{a+\frac{b}{x}}(120x^5 - 120bx^4\log(f) + 60b^2x^3\log^2(f) - 20b^3x^2\log^3(f) + 5b^4x\log^4(f) - b^5\log^5(f))}{b^6x^5\log^6(f)}$$

```
[Out] f^(a+b/x)*(120*x^5-120*b*x^4*ln(f)+60*b^2*x^3*ln(f)^2-20*b^3*x^2*ln(f)^3+5*
b^4*x*ln(f)^4-b^5*ln(f)^5)/b^6/x^5/ln(f)^6
```

Rubi [A]
time = 0.02, antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2249}

$$\frac{f^{a+\frac{b}{x}}(-b^5\log^5(f) + 5b^4x\log^4(f) - 20b^3x^2\log^3(f) + 60b^2x^3\log^2(f) - 120bx^4\log(f) + 120x^5)}{b^6x^5\log^6(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x)/x^7,x]
```

```
[Out] (f^(a + b/x)*(120*x^5 - 120*b*x^4*Log[f] + 60*b^2*x^3*Log[f]^2 - 20*b^3*x^2
*Log[f]^3 + 5*b^4*x*Log[f]^4 - b^5*Log[f]^5))/(b^6*x^5*Log[f]^6)
```

Rule 2249

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> With[{p = Simplify[(m + 1)/n]}, Simp[(-F^a)*((f/d)^m/(d*n*
((-b)*Log[F])^p))*Simplify[FunctionExpand[Gamma[p, (-b)*(c + d*x)^n*Log[F]]
]], x] /; IGtQ[p, 0]] /; FreeQ[{F, a, b, c, d, e, f, m, n}, x] && EqQ[d*e -
 c*f, 0] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x}}}{x^7} dx = \frac{f^a\Gamma\left(6, -\frac{b\log(f)}{x}\right)}{b^6\log^6(f)}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.00, size = 21, normalized size = 0.27

$$\frac{f^a\Gamma\left(6, -\frac{b\log(f)}{x}\right)}{b^6\log^6(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x)/x^7,x]
```

```
[Out] (f^a*Gamma[6, -((b*Log[f])/x)])/(b^6*Log[f]^6)
```

Maple [A]
time = 0.03, size = 80, normalized size = 1.04

method	result	size
risch	$-\frac{\left(b^{5} \ln \left(f\right)^{5}-5 b^{4} x \ln \left(f\right)^{4}+20 b^{3} x^{2} \ln \left(f\right)^{3}-60 b^{2} x^{3} \ln \left(f\right)^{2}+120 b \,x^{4} \ln \left(f\right)-120 x^{5}\right) f^{\frac{a x+b}{x}}}{b^{6} \ln \left(f\right)^{6} x^{5}}$	80
meijerg	$-\frac{f^{a} \left(120-\frac{\left(-\frac{6 b^{5} \ln \left(f\right)^{5}}{x^{5}}+\frac{30 b^{4} \ln \left(f\right)^{4}}{x^{4}}-\frac{120 b^{3} \ln \left(f\right)^{3}}{x^{3}}+\frac{360 b^{2} \ln \left(f\right)^{2}}{x^{2}}-\frac{720 b \ln \left(f\right)}{x}+720\right) {\mathrm e}^{\frac{b \ln \left(f\right)}{x}}}{6}\right)}{b^{6} \ln \left(f\right)^{6}}$	83
norman	$\frac{\frac{120 x^{6} {\mathrm e}^{\left(a+\frac{b}{x}\right) \ln \left(f\right)}}{b^{6} \ln \left(f\right)^{6}}-\frac{x \,{\mathrm e}^{\left(a+\frac{b}{x}\right) \ln \left(f\right)}}{\ln \left(f\right) b}+\frac{5 x^{2} {\mathrm e}^{\left(a+\frac{b}{x}\right) \ln \left(f\right)}}{b^{2} \ln \left(f\right)^{2}}-\frac{20 x^{3} {\mathrm e}^{\left(a+\frac{b}{x}\right) \ln \left(f\right)}}{b^{3} \ln \left(f\right)^{3}}+\frac{60 x^{4} {\mathrm e}^{\left(a+\frac{b}{x}\right) \ln \left(f\right)}}{b^{4} \ln \left(f\right)^{4}}-\frac{120 x^{5} {\mathrm e}^{\left(a+\frac{b}{x}\right) \ln \left(f\right)}}{b^{5} \ln \left(f\right)^{5}}}{x^{6}}$	142

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x)/x^7,x,method=_RETURNVERBOSE)
```

```
[Out] -(b^5*ln(f)^5-5*b^4*x*ln(f)^4+20*b^3*x^2*ln(f)^3-60*b^2*x^3*ln(f)^2+120*b*x
^4*ln(f)-120*x^5)/b^6/ln(f)^6/x^5*f^((a*x+b)/x)
```

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 0.32, size = 21, normalized size = 0.27

$$\frac{f^{a}\Gamma\left(6, -\frac{b \log\left(f\right)}{x}\right)}{b^{6} \log\left(f\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^7,x, algorithm="maxima")
```

```
[Out] f^a*gamma(6, -b*log(f)/x)/(b^6*log(f)^6)
```

Fricas [A]
time = 0.37, size = 79, normalized size = 1.03

$$-\frac{{\left(b^{5} \log\left(f\right)^{5} - 5 \, b^{4} x \log\left(f\right)^{4} + 20 \, b^{3} x^{2} \log\left(f\right)^{3} - 60 \, b^{2} x^{3} \log\left(f\right)^{2} + 120 \, b x^{4} \log\left(f\right) - 120 \, x^{5}\right)} f^{\frac{a x + b}{x}}}{b^{6} x^{5} \log\left(f\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^7,x, algorithm="fricas")
```

```
[Out] -(b^5*log(f)^5 - 5*b^4*x*log(f)^4 + 20*b^3*x^2*log(f)^3 - 60*b^2*x^3*log(f)
^2 + 120*b*x^4*log(f) - 120*x^5)*f^((a*x + b)/x)/(b^6*x^5*log(f)^6)
```

Sympy [A]
time = 0.06, size = 80, normalized size = 1.04

$$\frac{f^{a+\frac{b}{x}}\left(-b^{5}\log\left(f\right)^{5}+5b^{4}x\log\left(f\right)^{4}-20b^{3}x^{2}\log\left(f\right)^{3}+60b^{2}x^{3}\log\left(f\right)^{2}-120bx^{4}\log\left(f\right)+120x^{5}\right)}{b^{6}x^{5}\log\left(f\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x)/x**7,x)
```

```
[Out] f**(a + b/x)*(-b**5*log(f)**5 + 5*b**4*x*log(f)**4 - 20*b**3*x**2*log(f)**3
 + 60*b**2*x**3*log(f)**2 - 120*b*x**4*log(f) + 120*x**5)/(b**6*x**5*log(f)
**6)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^7,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x)/x^7, x)
```

Mupad [B]
time = 3.65, size = 81, normalized size = 1.05

$$-\frac{f^{a+\frac{b}{x}}\left(\frac{1}{b\,\ln(f)}+\frac{20\,x^2}{b^3\ln(f)^3}-\frac{60\,x^3}{b^4\ln(f)^4}+\frac{120\,x^4}{b^5\ln(f)^5}-\frac{120\,x^5}{b^6\ln(f)^6}-\frac{5\,x}{b^2\ln(f)^2}\right)}{x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x)/x^7,x)
```

```
[Out] -(f^(a + b/x)*(1/(b*log(f)) + (20*x^2)/(b^3*log(f)^3) - (60*x^3)/(b^4*log(f
)^4) + (120*x^4)/(b^5*log(f)^5) - (120*x^5)/(b^6*log(f)^6) - (5*x)/(b^2*log
(f)^2)))/x^5
```

3.128 $\int f^{a+\frac{b}{x^2}} x^m \, dx$

Optimal. Leaf size=46

$$\frac{1}{2} f^a x^{1+m} \Gamma\left(\frac{1}{2}(-1-m), -\frac{b\log(f)}{x^2}\right)\left(-\frac{b\log(f)}{x^2}\right)^{\frac{1+m}{2}}$$

```
[Out] 1/2*f^a*x^(1+m)*GAMMA(-1/2-1/2*m,-b*ln(f)/x^2)*(-b*ln(f)/x^2)^(1/2+1/2*m)
```

Rubi [A]
time = 0.02, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$\frac{1}{2} f^a x^{m+1} \left(-\frac{b\log(f)}{x^2}\right)^{\frac{m+1}{2}} \text{Gamma}\left(\frac{1}{2}(-m-1), -\frac{b\log(f)}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)*x^m,x]
```

```
[Out] (f^a*x^(1 + m)*Gamma[(-1 - m)/2, -((b*Log[f])/x^2)]*(-((b*Log[f])/x^2))^((1
 + m)/2))/2
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x^2}} x^m \, dx = \frac{1}{2} f^a x^{1+m} \Gamma\left(\frac{1}{2}(-1-m), -\frac{b\log(f)}{x^2}\right)\left(-\frac{b\log(f)}{x^2}\right)^{\frac{1+m}{2}}$$

Mathematica [A]
time = 0.01, size = 46, normalized size = 1.00

$$\frac{1}{2} f^a x^{1+m} \Gamma\left(\frac{1}{2}(-1-m), -\frac{b\log(f)}{x^2}\right)\left(-\frac{b\log(f)}{x^2}\right)^{\frac{1+m}{2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)*x^m,x]
```

```
[Out] (f^a*x^(1 + m)*Gamma[(-1 - m)/2, -((b*Log[f])/x^2)]*(-((b*Log[f])/x^2))^((1
 + m)/2))/2
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 168 vs. $2(38) = 76$.
time = 0.03, size = 169, normalized size = 3.67

method	result
meijerg	$-\frac{f^{a}(-b)^{\frac{m}{2}+\frac{1}{2}}\ln(f)^{\frac{m}{2}+\frac{1}{2}}\left(\frac{2x^{-1+m}(-b)^{-\frac{m}{2}-\frac{1}{2}}\ln(f)^{\frac{1}{2}-\frac{m}{2}}b\left(-\frac{b\ln(f)}{x^{2}}\right)^{-\frac{1}{2}+\frac{m}{2}}\Gamma\left(\frac{1}{2}-\frac{m}{2}\right)}{1+m}-\frac{2x^{1+m}(-b)^{-\frac{m}{2}-\frac{1}{2}}\ln(f)^{-\frac{m}{2}-\frac{1}{2}}e^{\frac{b\ln(f)}{x^{2}}}}{1+m}-\right.}{2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)*x^m,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*f^a*(-b)^(1/2*m+1/2)*ln(f)^(1/2*m+1/2)*(2/(1+m)*x^(-1+m)*(-b)^(-1/2*m-
1/2)*ln(f)^(1/2-1/2*m)*b*(-b*ln(f)/x^2)^(-1/2+1/2*m)*GAMMA(1/2-1/2*m)-2/(1+
m)*x^(1+m)*(-b)^(-1/2*m-1/2)*ln(f)^(-1/2*m-1/2)*exp(b*ln(f)/x^2)-2/(1+m)*x^
(-1+m)*(-b)^(-1/2*m-1/2)*ln(f)^(1/2-1/2*m)*b*(-b*ln(f)/x^2)^(-1/2+1/2*m)*GA
MMA(1/2-1/2*m,-b*ln(f)/x^2))
```

Maxima [A]
time = 0.06, size = 38, normalized size = 0.83

$$\frac{1}{2}\,f^{a}x^{m+1}\left(-\frac{b\log\left(f\right)}{x^{2}}\right)^{\frac{1}{2}\,m+\frac{1}{2}}\Gamma\left(-\frac{1}{2}\,m-\frac{1}{2},-\frac{b\log\left(f\right)}{x^{2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^m,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*x^(m + 1)*(-b*log(f)/x^2)^(1/2*m + 1/2)*gamma(-1/2*m - 1/2, -b*log(
f)/x^2)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^m,x, algorithm="fricas")
```

```
[Out] integral(f^((a*x^2 + b)/x^2)*x^m, x)
```

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

$$\int f^{a+\frac{b}{x^2}}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)*x**m,x)
```

```
[Out] Integral(f**(a + b/x**2)*x**m, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^m,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)*x^m, x)
```

Mupad [B]
time = 3.51, size = 54, normalized size = 1.17

$$\frac{f^a\,x^{m+1}\,\mathrm{e}^{\frac{b\,\ln(f)}{2\,x^2}}\,\mathrm{M}_{\frac{m}{4}+\frac{3}{4},-\frac{m}{4}-\frac{1}{4}}\left(\frac{b\,\ln(f)}{x^2}\right)\,\left(\frac{b\,\ln(f)}{x^2}\right)^{\frac{m}{4}-\frac{1}{4}}}{m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)*x^m,x)
```

```
[Out] (f^a*x^(m + 1)*exp((b*log(f))/(2*x^2))*whittakerM(m/4 + 3/4, - m/4 - 1/4, (
b*log(f))/x^2)*((b*log(f))/x^2)^(m/4 - 1/4))/(m + 1)
```

3.129 $\int f^{a+\frac{b}{x^2}} x^9 \, dx$

Optimal. Leaf size=24

$$-\frac{1}{2}b^5 f^a \Gamma\left(-5, -\frac{b\log(f)}{x^2}\right)\log^5(f)$$

```
[Out] 1/2*f^a*x^10*Ei(6,-b*ln(f)/x^2)
```

Rubi [A]
time = 0.02, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$-\frac{1}{2}b^5 f^a \log^5(f)\text{Gamma}\left(-5, -\frac{b\log(f)}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)*x^9,x]
```

```
[Out] -1/2*(b^5*f^a*Gamma[-5, -((b*Log[f])/x^2)]*Log[f]^5)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x^2}} x^9 \, dx = -\frac{1}{2}b^5 f^a \Gamma\left(-5, -\frac{b\log(f)}{x^2}\right)\log^5(f)$$

Mathematica [A]
time = 0.00, size = 24, normalized size = 1.00

$$-\frac{1}{2}b^5 f^a \Gamma\left(-5, -\frac{b\log(f)}{x^2}\right)\log^5(f)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)*x^9,x]
```

```
[Out] -1/2*(b^5*f^a*Gamma[-5, -((b*Log[f])/x^2)]*Log[f]^5)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 122 vs. $2(18) = 36$.
time = 0.05, size = 123, normalized size = 5.12

method	result
risch	$\frac{f^{a} x^{10} f^{\frac{b}{x^{2}}}}{10}+\frac{f^{a} \ln(f) b\, x^{8} f^{\frac{b}{x^{2}}}}{40}+\frac{f^{a} \ln(f)^{2} b^{2} x^{6} f^{\frac{b}{x^{2}}}}{120}+\frac{f^{a} \ln(f)^{3} b^{3} x^{4} f^{\frac{b}{x^{2}}}}{240}+\frac{f^{a} \ln(f)^{4} b^{4} x^{2} f^{\frac{b}{x^{2}}}}{240}+\frac{f^{a} \ln(f)^{5} b^{5} \operatorname{expIntegral}\left(1,-\right.}{240}$
meijerg	$\frac{f^{a} b^{5} \ln(f)^{5} \left(-\frac{x^{10}\left(\frac{137 b^{5} \ln(f)^{5}}{x^{10}}+\frac{300 b^{4} \ln(f)^{4}}{x^{8}}+\frac{600 b^{3} \ln(f)^{3}}{x^{6}}+\frac{1200 b^{2} \ln(f)^{2}}{x^{4}}+\frac{1800 b \ln(f)}{x^{2}}+1440\right)}{7200 b^{5} \ln(f)^{5}}+\frac{x^{10}\left(\frac{6 b^{4} \ln(f)^{4}}{x^{8}}+\frac{6 b^{3} \ln(f)^{3}}{x^{6}}+\frac{12 b^{2} \ln(f)^{2}}{x^{4}}\right.}{720 b^{5} \ln(f)^{5}}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)*x^9,x,method=_RETURNVERBOSE)
```

```
[Out] 1/10*f^a*x^10*f^(b/x^2)+1/40*f^a*ln(f)*b*x^8*f^(b/x^2)+1/120*f^a*ln(f)^2*b^
2*x^6*f^(b/x^2)+1/240*f^a*ln(f)^3*b^3*x^4*f^(b/x^2)+1/240*f^a*ln(f)^4*b^4*x
^2*f^(b/x^2)+1/240*f^a*ln(f)^5*b^5*Ei(1,-b*ln(f)/x^2)
```

Maxima [A]
time = 0.06, size = 22, normalized size = 0.92

$$-\frac{1}{2}\, b^{5} f^{a} \Gamma\left(-5, -\frac{b \log\left(f\right)}{x^{2}}\right) \log\left(f\right)^{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^9,x, algorithm="maxima")
```

```
[Out] -1/2*b^5*f^a*gamma(-5, -b*log(f)/x^2)*log(f)^5
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 84 vs. $2(18) = 36$.
time = 0.11, size = 84, normalized size = 3.50

$$-\frac{1}{240}\, b^{5} f^{a} {\rm Ei}\left(\frac{b \log\left(f\right)}{x^{2}}\right) \log\left(f\right)^{5} + \frac{1}{240}\, {\left(24\, x^{10} + 6\, b x^{8} \log\left(f\right) + 2\, b^{2} x^{6} \log\left(f\right)^{2} + b^{3} x^{4} \log\left(f\right)^{3} + b^{4} x^{2} \log\left(f\right)^{4}\right)} f^{\frac{a x^{2} + b}{x^{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^9,x, algorithm="fricas")
```

```
[Out] -1/240*b^5*f^a*Ei(b*log(f)/x^2)*log(f)^5 + 1/240*(24*x^10 + 6*b*x^8*log(f)
+ 2*b^2*x^6*log(f)^2 + b^3*x^4*log(f)^3 + b^4*x^2*log(f)^4)*f^((a*x^2 + b)/
x^2)
```

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

$$\int f^{a + \frac{b}{x^{2}}} x^{9}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)*x**9,x)
```

```
[Out] Integral(f**(a + b/x**2)*x**9, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^9,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)*x^9, x)
```

Mupad [B]
time = 3.79, size = 102, normalized size = 4.25

$$\frac{b^5\,f^a\ln\left(f\right)^5\,\mathrm{expint}\left(-\frac{b\,\ln(f)}{x^2}\right)}{240}+\frac{b^5\,f^a\,f^{\frac{b}{x^2}}\,\ln\left(f\right)^5\,\left(\frac{x^2}{120\,b\,\ln(f)}+\frac{x^4}{120\,b^2\ln(f)^2}+\frac{x^6}{60\,b^3\ln(f)^3}+\frac{x^8}{20\,b^4\ln(f)^4}+\frac{x^{10}}{5\,b^5\ln(f)^5}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)*x^9,x)
```

```
[Out] (b^5*f^a*log(f)^5*expint(-(b*log(f))/x^2))/240 + (b^5*f^a*f^(b/x^2)*log(f)^
5*(x^2/(120*b*log(f)) + x^4/(120*b^2*log(f)^2) + x^6/(60*b^3*log(f)^3) + x^
8/(20*b^4*log(f)^4) + x^10/(5*b^5*log(f)^5)))/2
```

3.130 $\int f^{a+\frac{b}{x^2}} x^7 \, dx$

Optimal. Leaf size=24

$$\frac{1}{2}b^4 f^a \Gamma\left(-4, -\frac{b\log(f)}{x^2}\right)\log^4(f)$$

```
[Out] 1/2*f^a*x^8*Ei(5,-b*ln(f)/x^2)
```

Rubi [A]
time = 0.02, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$\frac{1}{2}b^4 f^a \log^4(f)\text{Gamma}\left(-4, -\frac{b\log(f)}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)*x^7,x]
```

```
[Out] (b^4*f^a*Gamma[-4, -((b*Log[f])/x^2)]*Log[f]^4)/2
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x^2}} x^7 \, dx = \frac{1}{2}b^4 f^a \Gamma\left(-4, -\frac{b\log(f)}{x^2}\right)\log^4(f)$$

Mathematica [A]
time = 0.00, size = 24, normalized size = 1.00

$$\frac{1}{2}b^4 f^a \Gamma\left(-4, -\frac{b\log(f)}{x^2}\right)\log^4(f)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)*x^7,x]
```

```
[Out] (b^4*f^a*Gamma[-4, -((b*Log[f])/x^2)]*Log[f]^4)/2
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 100 vs. $2(18) = 36$.
time = 0.04, size = 101, normalized size = 4.21

method	result
risch	$\frac{f^{a} x^{8} f^{\frac{b}{x^{2}}}}{8}+\frac{f^{a} \ln \left(f \right) b \,x^{6} f^{\frac{b}{x^{2}}}}{24}+\frac{f^{a} \ln \left(f \right)^{2} b^{2} x^{4} f^{\frac{b}{x^{2}}}}{48}+\frac{f^{a} \ln \left(f \right)^{3} b^{3} x^{2} f^{\frac{b}{x^{2}}}}{48}+\frac{f^{a} \ln \left(f \right)^{4} b^{4} \operatorname{expIntegral}\left(1,-\frac{b \ln \left(f \right)}{x^{2}}\right)}{48}$
meijerg	$-\frac{f^{a} b^{4} \ln \left(f \right)^{4} \left(\frac{x^{8} \left(\frac{125 b^{4} \ln \left(f \right)^{4}}{x^{8}}+\frac{240 b^{3} \ln \left(f \right)^{3}}{x^{6}}+\frac{360 b^{2} \ln \left(f \right)^{2}}{x^{4}}+\frac{480 b \ln \left(f \right)}{x^{2}}+360\right)}{1440 b^{4} \ln \left(f \right)^{4}}-\frac{x^{8} \left(\frac{5 b^{3} \ln \left(f \right)^{3}}{x^{6}}+\frac{5 b^{2} \ln \left(f \right)^{2}}{x^{4}}+\frac{10 b \ln \left(f \right)}{x^{2}}+30\right) {\mathrm e}^{\frac{b \ln \left(f \right)}{x^{2}}}}{120 b^{4} \ln \left(f \right)^{4}}-\frac{\ln \left(\ldots\right.}{\ldots}}{2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)*x^7,x,method=_RETURNVERBOSE)
```

```
[Out] 1/8*f^a*x^8*f^(b/x^2)+1/24*f^a*ln(f)*b*x^6*f^(b/x^2)+1/48*f^a*ln(f)^2*b^2*x
^4*f^(b/x^2)+1/48*f^a*ln(f)^3*b^3*x^2*f^(b/x^2)+1/48*f^a*ln(f)^4*b^4*Ei(1,-
b*ln(f)/x^2)
```

Maxima [A]
time = 0.06, size = 22, normalized size = 0.92

$$\frac{1}{2} \, b^{4} f^{a} \Gamma\left(-4, -\frac{b \log\left(f\right)}{x^{2}}\right) \log\left(f\right)^{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^7,x, algorithm="maxima")
```

```
[Out] 1/2*b^4*f^a*gamma(-4, -b*log(f)/x^2)*log(f)^4
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 72 vs. $2(18) = 36$.
time = 0.12, size = 72, normalized size = 3.00

$$-\frac{1}{48} \, b^{4} f^{a} {\rm Ei}\left(\frac{b \log\left(f\right)}{x^{2}}\right) \log\left(f\right)^{4} + \frac{1}{48} \, {\left(6 \, x^{8} + 2 \, b x^{6} \log\left(f\right) + b^{2} x^{4} \log\left(f\right)^{2} + b^{3} x^{2} \log\left(f\right)^{3}\right)} f^{\frac{a x^{2} + b}{x^{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^7,x, algorithm="fricas")
```

```
[Out] -1/48*b^4*f^a*Ei(b*log(f)/x^2)*log(f)^4 + 1/48*(6*x^8 + 2*b*x^6*log(f) + b^
2*x^4*log(f)^2 + b^3*x^2*log(f)^3)*f^((a*x^2 + b)/x^2)
```

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

$$\int f^{a + \frac{b}{x^{2}}} x^{7}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)*x**7,x)
```

```
[Out] Integral(f**(a + b/x**2)*x**7, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^7,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)*x^7, x)
```

Mupad [B]
time = 3.77, size = 90, normalized size = 3.75

$$\frac{b^4\,f^a\,\ln\left(f\right)^4\,\mathrm{expint}\left(-\frac{b\,\ln(f)}{x^2}\right)}{48}+\frac{b^4\,f^a\,f^{\frac{b}{x^2}}\,\ln\left(f\right)^4\,\left(\frac{x^2}{24\,b\,\ln(f)}+\frac{x^4}{24\,b^2\,\ln(f)^2}+\frac{x^6}{12\,b^3\,\ln(f)^3}+\frac{x^8}{4\,b^4\,\ln(f)^4}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)*x^7,x)
```

```
[Out] (b^4*f^a*log(f)^4*expint(-(b*log(f))/x^2))/48 + (b^4*f^a*f^(b/x^2)*log(f)^4
*(x^2/(24*b*log(f)) + x^4/(24*b^2*log(f)^2) + x^6/(12*b^3*log(f)^3) + x^8/(
4*b^4*log(f)^4)))/2
```

3.131 $\int f^{a+\frac{b}{x^2}} x^5 \, dx$

Optimal. Leaf size=81

$$\frac{1}{6} f^{a+\frac{b}{x^2}} x^6 + \frac{1}{12} b f^{a+\frac{b}{x^2}} x^4 \log(f) + \frac{1}{12} b^2 f^{a+\frac{b}{x^2}} x^2 \log^2(f) - \frac{1}{12} b^3 f^a \text{Ei}\left(\frac{b \log(f)}{x^2}\right) \log^3(f)$$

```
[Out] 1/6*f^(a+b/x^2)*x^6+1/12*b*f^(a+b/x^2)*x^4*ln(f)+1/12*b^2*f^(a+b/x^2)*x^2*l
n(f)^2-1/12*b^3*f^a*Ei(b*ln(f)/x^2)*ln(f)^3
```

Rubi [A]
time = 0.06, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2245, 2241}

$$-\frac{1}{12} b^3 f^a \log^3(f) \text{Ei}\left(\frac{b \log(f)}{x^2}\right) + \frac{1}{12} b^2 x^2 \log^2(f) f^{a+\frac{b}{x^2}} + \frac{1}{6} x^6 f^{a+\frac{b}{x^2}} + \frac{1}{12} b x^4 \log(f) f^{a+\frac{b}{x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)*x^5,x]
```

```
[Out] (f^(a + b/x^2)*x^6)/6 + (b*f^(a + b/x^2)*x^4*Log[f])/12 + (b^2*f^(a + b/x^2
)*x^2*Log[f]^2)/12 - (b^3*f^a*ExpIntegralEi[(b*Log[f])/x^2]*Log[f]^3)/12
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$
\begin{aligned}
\int f^{a+\frac{b}{x^2}} x^5\,dx &= \frac{1}{6} f^{a+\frac{b}{x^2}} x^6+\frac{1}{3} (b \log (f)) \int f^{a+\frac{b}{x^2}} x^3\,dx \\
&= \frac{1}{6} f^{a+\frac{b}{x^2}} x^6+\frac{1}{12} b f^{a+\frac{b}{x^2}} x^4 \log (f)+\frac{1}{6} \left(b^2 \log ^2(f)\right) \int f^{a+\frac{b}{x^2}} x\,dx \\
&= \frac{1}{6} f^{a+\frac{b}{x^2}} x^6+\frac{1}{12} b f^{a+\frac{b}{x^2}} x^4 \log (f)+\frac{1}{12} b^2 f^{a+\frac{b}{x^2}} x^2 \log ^2(f)+\frac{1}{6} \left(b^3 \log ^3(f)\right) \int \frac{f^{a+\frac{b}{x^2}}}{x}\,dx \\
&= \frac{1}{6} f^{a+\frac{b}{x^2}} x^6+\frac{1}{12} b f^{a+\frac{b}{x^2}} x^4 \log (f)+\frac{1}{12} b^2 f^{a+\frac{b}{x^2}} x^2 \log ^2(f)-\frac{1}{12} b^3 f^a \text{Ei}\left(\frac{b \log (f)}{x^2}\right) \log ^3(f)
\end{aligned}
$$

Mathematica [A]
time = 0.02, size = 57, normalized size = 0.70

$$
\frac{1}{12} f^a \left(-b^3 \text{Ei}\left(\frac{b \log (f)}{x^2}\right) \log ^3(f)+f^{\frac{b}{x^2}} x^2 \left(2 x^4+b x^2 \log (f)+b^2 \log ^2(f)\right)\right)
$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)*x^5,x]
```

```
[Out] (f^a*(-(b^3*ExpIntegralEi[(b*Log[f])/x^2]*Log[f]^3) + f^(b/x^2)*x^2*(2*x^4
+ b*x^2*Log[f] + b^2*Log[f]^2)))/12
```

Maple [A]
time = 0.03, size = 79, normalized size = 0.98

method	result
risch	$\frac{f^a x^6 f^{\frac{b}{x^2}}}{6}+\frac{f^a \ln(f) b x^4 f^{\frac{b}{x^2}}}{12}+\frac{f^a \ln(f)^2 b^2 x^2 f^{\frac{b}{x^2}}}{12}+\frac{f^a \ln(f)^3 b^3 \,\mathrm{expIntegral}\left(1,-\frac{b\ln(f)}{x^2}\right)}{12}$
meijerg	$\frac{f^a b^3 \ln(f)^3 \left(-\frac{x^6\left(\frac{22b^3\ln(f)^3}{x^6}+\frac{36b^2\ln(f)^2}{x^4}+\frac{36b\ln(f)}{x^2}+24\right)}{72b^3\ln(f)^3}+\frac{x^6\left(\frac{4b^2\ln(f)^2}{x^4}+\frac{4b\ln(f)}{x^2}+8\right)\mathrm{e}^{\frac{b\ln(f)}{x^2}}}{24b^3\ln(f)^3}+\frac{\ln\left(-\frac{b\ln(f)}{x^2}\right)}{6}+\frac{\mathrm{expIntegral}\left(1,-\frac{b\ln(f)}{x^2}\right)}{6}\right.}{2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)*x^5,x,method=_RETURNVERBOSE)
```

```
[Out] 1/6*f^a*x^6*f^(b/x^2)+1/12*f^a*ln(f)*b*x^4*f^(b/x^2)+1/12*f^a*ln(f)^2*b^2*x
^2*f^(b/x^2)+1/12*f^a*ln(f)^3*b^3*Ei(1,-b*ln(f)/x^2)
```

Maxima [A]
time = 0.33, size = 22, normalized size = 0.27

$$
-\frac{1}{2} \, b^{3} f^{a} \Gamma\left(-3, -\frac{b \log\left(f\right)}{x^{2}}\right) \log\left(f\right)^{3}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^5,x, algorithm="maxima")
[Out] -1/2*b^3*f^a*gamma(-3, -b*log(f)/x^2)*log(f)^3
```

Fricas [A]
time = 0.36, size = 60, normalized size = 0.74

$$-\frac{1}{12}\,b^3 f^a \mathrm{Ei}\left(\frac{b\log{(f)}}{x^2}\right)\log{(f)}^3+\frac{1}{12}\left(2\,x^6+bx^4\log{(f)}+b^2x^2\log{(f)}^2\right)f^{\frac{ax^2+b}{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^5,x, algorithm="fricas")
[Out] -1/12*b^3*f^a*Ei(b*log(f)/x^2)*log(f)^3 + 1/12*(2*x^6 + b*x^4*log(f) + b^2*
x^2*log(f)^2)*f^((a*x^2 + b)/x^2)
```

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

$$\int f^{a+\frac{b}{x^2}}x^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)*x**5,x)
[Out] Integral(f**(a + b/x**2)*x**5, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^5,x, algorithm="giac")
[Out] integrate(f^(a + b/x^2)*x^5, x)
```

Mupad [B]
time = 3.74, size = 69, normalized size = 0.85

$$\frac{b^3\,f^a\,\ln{(f)}^3\,\left(f^{\frac{b}{x^2}}\,\left(\frac{x^2}{6\,b\,\ln(f)}+\frac{x^4}{6\,b^2\,\ln(f)^2}+\frac{x^6}{3\,b^3\,\ln(f)^3}\right)+\frac{\mathrm{expint}\left(-\frac{b\,\ln(f)}{x^2}\right)}{6}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)*x^5,x)
[Out] (b^3*f^a*log(f)^3*(f^(b/x^2)*(x^2/(6*b*log(f)) + x^4/(6*b^2*log(f)^2) + x^6
/(3*b^3*log(f)^3)) + expint(-(b*log(f))/x^2)/6))/2
```

3.132 $\int f^{a+\frac{b}{x^2}} x^3\,dx$

Optimal. Leaf size=58

$$\frac{1}{4}f^{a+\frac{b}{x^2}}x^4+\frac{1}{4}bf^{a+\frac{b}{x^2}}x^2\log(f)-\frac{1}{4}b^2f^a\text{Ei}\left(\frac{b\log(f)}{x^2}\right)\log^2(f)$$

```
[Out] 1/4*f^(a+b/x^2)*x^4+1/4*b*f^(a+b/x^2)*x^2*ln(f)-1/4*b^2*f^a*Ei(b*ln(f)/x^2)
*ln(f)^2
```

Rubi [A]
time = 0.04, antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2245, 2241}

$$-\frac{1}{4}b^2f^a\log^2(f)\text{Ei}\left(\frac{b\log(f)}{x^2}\right)+\frac{1}{4}bx^2\log(f)f^{a+\frac{b}{x^2}}+\frac{1}{4}x^4f^{a+\frac{b}{x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)*x^3,x]
```

```
[Out] (f^(a + b/x^2)*x^4)/4 + (b*f^(a + b/x^2)*x^2*Log[f])/4 - (b^2*f^a*ExpIntegr
alEi[(b*Log[f])/x^2]*Log[f]^2)/4
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int f^{a+\frac{b}{x^2}}x^3\,dx &= \frac{1}{4}f^{a+\frac{b}{x^2}}x^4+\frac{1}{2}(b\log(f))\int f^{a+\frac{b}{x^2}}x\,dx\\ &= \frac{1}{4}f^{a+\frac{b}{x^2}}x^4+\frac{1}{4}bf^{a+\frac{b}{x^2}}x^2\log(f)+\frac{1}{2}\left(b^2\log^2(f)\right)\int\frac{f^{a+\frac{b}{x^2}}}{x}\,dx\\ &= \frac{1}{4}f^{a+\frac{b}{x^2}}x^4+\frac{1}{4}bf^{a+\frac{b}{x^2}}x^2\log(f)-\frac{1}{4}b^2f^a\text{Ei}\left(\frac{b\log(f)}{x^2}\right)\log^2(f)\end{aligned}$$

Mathematica [A]
time = 0.01, size = 44, normalized size = 0.76

$$\frac{1}{4}f^a\left(-b^2\text{Ei}\left(\frac{b\log(f)}{x^2}\right)\log^2(f)+f^{\frac{b}{x^2}}x^2\left(x^2+b\log(f)\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)*x^3,x]
```

```
[Out] (f^a*(-(b^2*ExpIntegralEi[(b*Log[f])/x^2]*Log[f]^2) + f^(b/x^2)*x^2*(x^2 +
b*Log[f])))/4
```

Maple [A]
time = 0.03, size = 57, normalized size = 0.98

method	result
risch	$\frac{f^a x^4 f^{\frac{b}{x^2}}}{4}+\frac{f^a\ln(f)b\,x^2 f^{\frac{b}{x^2}}}{4}+\frac{f^a\ln(f)^2b^2\,\text{expIntegral}\left(1,-\frac{b\ln(f)}{x^2}\right)}{4}$
meijerg	$-\frac{f^a b^2\ln(f)^2\left(\frac{x^4\left(\frac{9b^2\ln(f)^2}{x^4}+\frac{12b\ln(f)}{x^2}+6\right)}{12b^2\ln(f)^2}-\frac{x^4\left(3+\frac{3b\ln(f)}{x^2}\right)e^{\frac{b\ln(f)}{x^2}}}{6b^2\ln(f)^2}-\frac{\ln\left(-\frac{b\ln(f)}{x^2}\right)}{2}-\frac{\text{expIntegral}\left(1,-\frac{b\ln(f)}{x^2}\right)}{2}-\frac{3}{4}-\ln(x)+\frac{\ln(-b)}{2}+\ln\right.}{2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)*x^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/4*f^a*x^4*f^(b/x^2)+1/4*f^a*ln(f)*b*x^2*f^(b/x^2)+1/4*f^a*ln(f)^2*b^2*Ei(
1,-b*ln(f)/x^2)
```

Maxima [A]
time = 0.33, size = 22, normalized size = 0.38

$$\frac{1}{2}\,b^2f^a\Gamma\left(-2,-\frac{b\log\left(f\right)}{x^2}\right)\log\left(f\right)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^3,x, algorithm="maxima")
```

```
[Out] 1/2*b^2*f^a*gamma(-2, -b*log(f)/x^2)*log(f)^2
```

Fricas [A]
time = 0.45, size = 47, normalized size = 0.81

$$-\frac{1}{4}\,b^2f^a\mathrm{Ei}\left(\frac{b\log\left(f\right)}{x^2}\right)\log\left(f\right)^2+\frac{1}{4}\left(x^4+bx^2\log\left(f\right)\right)f^{\frac{ax^2+b}{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^3,x, algorithm="fricas")
```

```
[Out] -1/4*b^2*f^a*Ei(b*log(f)/x^2)*log(f)^2 + 1/4*(x^4 + b*x^2*log(f))*f^((a*x^2
 + b)/x^2)
```

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

$$\int f^{a+\frac{b}{x^2}}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)*x**3,x)
```

```
[Out] Integral(f**(a + b/x**2)*x**3, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^3,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)*x^3, x)
```

Mupad [B]
time = 3.65, size = 57, normalized size = 0.98

$$\frac{b^2\,f^a\,\ln\left(f\right)^2\,\left(f^{\frac{b}{x^2}}\,\left(\frac{x^2}{2\,b\,\ln\left(f\right)}+\frac{x^4}{2\,b^2\,\ln\left(f\right)^2}\right)+\frac{\mathrm{expint}\left(-\frac{b\,\ln\left(f\right)}{x^2}\right)}{2}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)*x^3,x)
```

```
[Out] (b^2*f^a*log(f)^2*(f^(b/x^2)*(x^2/(2*b*log(f)) + x^4/(2*b^2*log(f)^2)) + ex
pint(-(b*log(f))/x^2)/2))/2
```

3.133 $\int f^{a+\frac{b}{x^2}} x \, dx$

Optimal. Leaf size=35

$$\frac{1}{2} f^{a+\frac{b}{x^2}} x^2 - \frac{1}{2} b f^a \mathrm{Ei}\left(\frac{b \log(f)}{x^2}\right) \log(f)$$

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

Rubi [A]
time = 0.03, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = {2245, 2241}

$$\frac{1}{2} x^2 f^{a+\frac{b}{x^2}} - \frac{1}{2} b f^a \log(f) \mathrm{Ei}\left(\frac{b \log(f)}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)*x,x]
```

```
[Out] (f^(a + b/x^2)*x^2)/2 - (b*f^a*ExpIntegralEi[(b*Log[f])/x^2]*Log[f])/2
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

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

Mathematica [A]
time = 0.01, size = 32, normalized size = 0.91

$$\frac{1}{2}f^a\left(f^{\frac{b}{x^2}}x^2-b\mathrm{Ei}\left(\frac{b\log(f)}{x^2}\right)\log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)*x,x]
[Out] (f^a*(f^(b/x^2)*x^2 - b*ExpIntegralEi[(b*Log[f])/x^2]*Log[f]))/2
```

Maple [A]
time = 0.02, size = 35, normalized size = 1.00

method	result	size
risch	$\frac{f^a x^2 f^{\frac{b}{x^2}}}{2}+\frac{f^a \ln(f) b\,\mathrm{expIntegral}\left(1,-\frac{b\ln(f)}{x^2}\right)}{2}$	35
meijerg	$\frac{f^a b\ln(f)\left(-\frac{x^2\left(2+\frac{2b\ln(f)}{x^2}\right)}{2b\ln(f)}+\frac{x^2 \mathrm{e}^{\frac{b\ln(f)}{x^2}}}{b\ln(f)}+\ln\left(-\frac{b\ln(f)}{x^2}\right)+\mathrm{expIntegral}\left(1,-\frac{b\ln(f)}{x^2}\right)+1+2\ln(x)-\ln(-b)-\ln(\ln(f))+\frac{x^2}{b\ln(f)}\right)}{2}$	97

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)*x,x,method=_RETURNVERBOSE)
[Out] 1/2*f^a*x^2*f^(b/x^2)+1/2*f^a*ln(f)*b*Ei(1,-b*ln(f)/x^2)
```

Maxima [A]
time = 0.32, size = 18, normalized size = 0.51

$$-\frac{1}{2}\,bf^a\Gamma\left(-1,-\frac{b\log(f)}{x^2}\right)\log(f)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x,x, algorithm="maxima")
[Out] -1/2*b*f^a*gamma(-1, -b*log(f)/x^2)*log(f)
```

Fricas [A]
time = 0.38, size = 35, normalized size = 1.00

$$-\frac{1}{2}\,bf^a\mathrm{Ei}\left(\frac{b\log(f)}{x^2}\right)\log(f)+\frac{1}{2}\,f^{\frac{ax^2+b}{x^2}}x^2$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)*x,x)
[Out] Integral(f**(a + b/x**2)*x, x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x,x, algorithm="giac")
[Out] integrate(f^(a + b/x^2)*x, x)
```

Mupad [**B**]
time = 3.57, size = 33, normalized size = 0.94

$$\frac{f^a\,f^{\frac{b}{x^2}}\,x^2}{2}+\frac{b\,f^a\,\ln\left(f\right)\,\mathrm{expint}\left(-\frac{b\,\ln(f)}{x^2}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)*x,x)
[Out] (f^a*f^(b/x^2)*x^2)/2 + (b*f^a*log(f)*expint(-(b*log(f))/x^2))/2
```

3.134 $\int \frac{f^{a+\frac{b}{x^2}}}{x} \, dx$

Optimal. Leaf size=15

$$-\frac{1}{2} f^a \text{Ei}\left(\frac{b \log(f)}{x^2}\right)$$

[Out] -1/2*f^a*Ei(b*ln(f)/x^2)

Rubi [A]
time = 0.02, antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = $\{2241\}$

$$-\frac{1}{2} f^a \text{Ei}\left(\frac{b \log(f)}{x^2}\right)$$

Antiderivative was successfully verified.

[In] Int[f^(a + b/x^2)/x,x]

[Out] -1/2*(f^a*ExpIntegralEi[(b*Log[f])/x^2])

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^2}}}{x} \, dx = -\frac{1}{2} f^a \text{Ei}\left(\frac{b \log(f)}{x^2}\right)$$

Mathematica [A]
time = 0.00, size = 15, normalized size = 1.00

$$-\frac{1}{2} f^a \text{Ei}\left(\frac{b \log(f)}{x^2}\right)$$

Antiderivative was successfully verified.

[In] Integrate[f^(a + b/x^2)/x,x]

[Out] -1/2*(f^a*ExpIntegralEi[(b*Log[f])/x^2])

Maple [A]
time = 0.02, size = 16, normalized size = 1.07

method	result	size
risch	$\frac{f^{a} \operatorname{expIntegral}\left(1,-\frac{b \ln(f)}{x^{2}}\right)}{2}$	16
meijerg	$-\frac{f^{a}\left(-\ln\left(-\frac{b \ln(f)}{x^{2}}\right)-\operatorname{expIntegral}\left(1,-\frac{b \ln(f)}{x^{2}}\right)-2\ln(x)+\ln(-b)+\ln(\ln(f))\right)}{2}$	41

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x,x,method=_RETURNVERBOSE)
[Out] 1/2*f^a*Ei(1,-b*ln(f)/x^2)
```

Maxima [A]
time = 0.33, size = 13, normalized size = 0.87

$$-\frac{1}{2} f^{a} \operatorname{Ei}\left(\frac{b \log(f)}{x^{2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x,x, algorithm="maxima")
[Out] -1/2*f^a*Ei(b*log(f)/x^2)
```

Fricas [A]
time = 0.36, size = 13, normalized size = 0.87

$$-\frac{1}{2} f^{a} \operatorname{Ei}\left(\frac{b \log(f)}{x^{2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x,x, algorithm="fricas")
[Out] -1/2*f^a*Ei(b*log(f)/x^2)
```

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

$$\int \frac{f^{a+\frac{b}{x^{2}}}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x,x)
[Out] Integral(f**(a + b/x**2)/x, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)/x, x)
```

Mupad [B]
time = 3.50, size = 13, normalized size = 0.87

$$-\frac{f^a\,\mathrm{ei}\left(\frac{b\,\ln(f)}{x^2}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x,x)
```

```
[Out] -(f^a*ei((b*log(f))/x^2))/2
```

3.135 $\int \frac{f^{a+\frac{b}{x^2}}}{x^3} dx$

Optimal. Leaf size=20

$$-\frac{f^{a+\frac{b}{x^2}}}{2b\log(f)}$$

[Out] -1/2*f^(a+b/x^2)/b/ln(f)

Rubi [A]
time = 0.01, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2240}

$$-\frac{f^{a+\frac{b}{x^2}}}{2b\log(f)}$$

Antiderivative was successfully verified.

[In] Int[f^(a + b/x^2)/x^3,x]

[Out] -1/2*f^(a + b/x^2)/(b*Log[f])

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^3} dx = -\frac{f^{a+\frac{b}{x^2}}}{2b\log(f)}$$

Mathematica [A]
time = 0.00, size = 20, normalized size = 1.00

$$-\frac{f^{a+\frac{b}{x^2}}}{2b\log(f)}$$

Antiderivative was successfully verified.

[In] Integrate[f^(a + b/x^2)/x^3,x]

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

Maple [A]
time = 0.01, size = 19, normalized size = 0.95

method	result	size
derivativedivides	$-\frac{f^{a+\frac{b}{x^2}}}{2b\ln(f)}$	19
default	$-\frac{f^{a+\frac{b}{x^2}}}{2b\ln(f)}$	19
norman	$-\frac{e^{\left(a+\frac{b}{x^2}\right)\ln(f)}}{2b\ln(f)}$	21
risch	$-\frac{f^{\frac{a\,x^2+b}{x^2}}}{2b\ln(f)}$	23
meijerg	$\frac{f^a\left(1-e^{\frac{b\ln(f)}{x^2}}\right)}{2b\ln(f)}$	25

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^3,x,method=_RETURNVERBOSE)
[Out] -1/2*f^(a+b/x^2)/b/ln(f)
```

Maxima [A]
time = 0.28, size = 18, normalized size = 0.90

$$-\frac{f^{a+\frac{b}{x^2}}}{2\,b\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^3,x, algorithm="maxima")
[Out] -1/2*f^(a + b/x^2)/(b*log(f))
```

Fricas [A]
time = 0.35, size = 22, normalized size = 1.10

$$-\frac{f^{\frac{ax^2+b}{x^2}}}{2\,b\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^3,x, algorithm="fricas")
[Out] -1/2*f^((a*x^2 + b)/x^2)/(b*log(f))
```

Sympy [A]
time = 0.04, size = 27, normalized size = 1.35

$$\begin{cases} -\frac{f^{a+\frac{b}{x^2}}}{2b\log{(f)}} & \text{for } b\log{(f)} \neq 0 \\ -\frac{1}{2x^2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**3,x)
```

```
[Out] Piecewise((-f**(a + b/x**2)/(2*b*log(f)), Ne(b*log(f), 0)), (-1/(2*x**2), T
rue))
```

Giac [A]
time = 3.02, size = 22, normalized size = 1.10

$$-\frac{f^{\frac{ax^2+b}{x^2}}}{2\,b\log{(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^3,x, algorithm="giac")
```

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

Mupad [B]
time = 3.45, size = 18, normalized size = 0.90

$$-\frac{f^{a+\frac{b}{x^2}}}{2\,b\,\ln{(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^3,x)
```

```
[Out] -f^(a + b/x^2)/(2*b*log(f))
```

3.136 $\int \frac{f^{a+\frac{b}{x^2}}}{x^5}\,dx$

Optimal. Leaf size=44

$$\frac{f^{a+\frac{b}{x^2}}}{2b^2\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^2\log(f)}$$

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

Rubi [A]

time = 0.03, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2243, 2240}

$$\frac{f^{a+\frac{b}{x^2}}}{2b^2\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^2\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^5,x]
```

```
[Out] f^(a + b/x^2)/(2*b^2*Log[f]^2) - f^(a + b/x^2)/(2*b*x^2*Log[f])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\begin{aligned}\int \frac{f^{a+\frac{b}{x^2}}}{x^5}\,dx &= -\frac{f^{a+\frac{b}{x^2}}}{2bx^2\log(f)}-\frac{\int \frac{f^{a+\frac{b}{x^2}}}{x^3}\,dx}{b\log(f)}\\ &= \frac{f^{a+\frac{b}{x^2}}}{2b^2\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^2\log(f)}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 32, normalized size = 0.73

$$\frac{f^{a+\frac{b}{x^2}}(x^2-b\log(f))}{2b^2x^2\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x^5,x]
[Out] (f^(a + b/x^2)*(x^2 - b*Log[f]))/(2*b^2*x^2*Log[f]^2)
```

Maple [A]
time = 0.02, size = 35, normalized size = 0.80

method	result	size
meijerg	$-\frac{f^{a}\left(1-\frac{\left(2-\frac{2b\ln(f)}{x^2}\right)e^{\frac{b\ln(f)}{x^2}}}{2}\right)}{2b^2\ln(f)^2}$	35
risch	$-\frac{(b\ln(f)-x^2)f^{\frac{a\,x^2+b}{x^2}}}{2\ln(f)^2b^2x^2}$	36
norman	$\frac{-\frac{x^2e^{\left(a+\frac{b}{x^2}\right)\ln(f)}}{2b\ln(f)}+\frac{x^4e^{\left(a+\frac{b}{x^2}\right)\ln(f)}}{2b^2\ln(f)^2}}{x^4}$	52

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^5,x,method=_RETURNVERBOSE)
[Out] -1/2*f^a/b^2/ln(f)^2*(1-1/2*(2-2*b*ln(f)/x^2)*exp(b*ln(f)/x^2))
```

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 0.33, size = 22, normalized size = 0.50

$$\frac{f^a\Gamma\left(2,-\frac{b\log(f)}{x^2}\right)}{2\,b^2\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^5,x, algorithm="maxima")
[Out] 1/2*f^a*gamma(2, -b*log(f)/x^2)/(b^2*log(f)^2)
```

Fricas [A]
time = 0.34, size = 34, normalized size = 0.77

$$\frac{(x^2-b\log(f))f^{\frac{ax^2+b}{x^2}}}{2\,b^2x^2\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^5,x, algorithm="fricas")
```

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

Sympy [A]
time = 0.05, size = 29, normalized size = 0.66

$$\frac{f^{a+\frac{b}{x^2}}\left(-b\log\left(f\right)+x^2\right)}{2b^2x^2\log\left(f\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**5,x)
```

```
[Out] f**(a + b/x**2)*(-b*log(f) + x**2)/(2*b**2*x**2*log(f)**2)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^5,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)/x^5, x)
```

Mupad [B]
time = 3.44, size = 36, normalized size = 0.82

$$-\frac{f^{a+\frac{b}{x^2}}\left(\frac{1}{2\,b\,\ln(f)}-\frac{x^2}{2\,b^2\,\ln(f)^2}\right)}{x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^5,x)
```

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

3.137 $\int \frac{f^{a+\frac{b}{x^2}}}{x^7}\,dx$

Optimal. Leaf size=62

$$-\frac{f^{a+\frac{b}{x^2}}}{b^3\log^3(f)}+\frac{f^{a+\frac{b}{x^2}}}{b^2x^2\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^4\log(f)}$$

```
[Out] -f^(a+b/x^2)/b^3/ln(f)^3+f^(a+b/x^2)/b^2/x^2/ln(f)^2-1/2*f^(a+b/x^2)/b/x^4/
ln(f)
```

Rubi [A]
time = 0.05, antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2243, 2240}

$$-\frac{f^{a+\frac{b}{x^2}}}{b^3\log^3(f)}+\frac{f^{a+\frac{b}{x^2}}}{b^2x^2\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^4\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^7,x]
```

```
[Out] -(f^(a + b/x^2)/(b^3*Log[f]^3)) + f^(a + b/x^2)/(b^2*x^2*Log[f]^2) - f^(a +
 b/x^2)/(2*b*x^4*Log[f])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^7}\,dx = -\frac{f^{a+\frac{b}{x^2}}}{2bx^4\log(f)} - \frac{2\int \frac{f^{a+\frac{b}{x^2}}}{x^5}\,dx}{b\log(f)}$$
$$= \frac{f^{a+\frac{b}{x^2}}}{b^2x^2\log^2(f)} - \frac{f^{a+\frac{b}{x^2}}}{2bx^4\log(f)} + \frac{2\int \frac{f^{a+\frac{b}{x^2}}}{x^3}\,dx}{b^2\log^2(f)}$$
$$= -\frac{f^{a+\frac{b}{x^2}}}{b^3\log^3(f)} + \frac{f^{a+\frac{b}{x^2}}}{b^2x^2\log^2(f)} - \frac{f^{a+\frac{b}{x^2}}}{2bx^4\log(f)}$$

Mathematica [A]
time = 0.01, size = 45, normalized size = 0.73

$$-\frac{f^{a+\frac{b}{x^2}}\left(2x^4-2bx^2\log(f)+b^2\log^2(f)\right)}{2b^3x^4\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x^7,x]
```

```
[Out] -1/2*(f^(a + b/x^2)*(2*x^4 - 2*b*x^2*Log[f] + b^2*Log[f]^2))/(b^3*x^4*Log[f
]^3)
```

Maple [A]
time = 0.02, size = 47, normalized size = 0.76

method	result	size
meijerg	$\frac{f^{a}\left(2-\frac{\left(\frac{3b^{2}\ln(f)^{2}}{x^{4}}-\frac{6b\ln(f)}{x^{2}}+6\right)e^{\frac{b\ln(f)}{x^{2}}}}{3}\right)}{2b^{3}\ln(f)^{3}}$	47
risch	$-\frac{\left(\ln(f)^{2}b^{2}-2b\,x^{2}\ln(f)+2x^{4}\right)f^{\frac{a\,x^{2}+b}{x^{2}}}}{2\ln(f)^{3}b^{3}x^{4}}$	48
norman	$\frac{\frac{x^{4}e^{\left(a+\frac{b}{x^{2}}\right)\ln(f)}}{b^{2}\ln(f)^{2}}-\frac{x^{2}e^{\left(a+\frac{b}{x^{2}}\right)\ln(f)}}{2b\ln(f)}-\frac{x^{6}e^{\left(a+\frac{b}{x^{2}}\right)\ln(f)}}{b^{3}\ln(f)^{3}}}{x^{6}}$	74

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^7,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*f^a/b^3/ln(f)^3*(2-1/3*(3*b^2*ln(f)^2/x^4-6*b*ln(f)/x^2+6)*exp(b*ln(f)/
x^2))
```

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 0.32, size = 22, normalized size = 0.35

$$-\frac{f^a\Gamma\left(3, -\frac{b\log(f)}{x^2}\right)}{2\,b^3\log\left(f\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^7,x, algorithm="maxima")
```

```
[Out] -1/2*f^a*gamma(3, -b*log(f)/x^2)/(b^3*log(f)^3)
```

Fricas [A]
time = 0.39, size = 47, normalized size = 0.76

$$-\frac{\left(2\,x^4-2\,bx^2\log\left(f\right)+b^2\log\left(f\right)^2\right)f^{\frac{ax^2+b}{x^2}}}{2\,b^3x^4\log\left(f\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^7,x, algorithm="fricas")
```

```
[Out] -1/2*(2*x^4 - 2*b*x^2*log(f) + b^2*log(f)^2)*f^((a*x^2 + b)/x^2)/(b^3*x^4*l
og(f)^3)
```

Sympy [A]
time = 0.06, size = 44, normalized size = 0.71

$$\frac{f^{a+\frac{b}{x^2}}\left(-b^2\log\left(f\right)^2+2bx^2\log\left(f\right)-2x^4\right)}{2b^3x^4\log\left(f\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**7,x)
```

```
[Out] f**(a + b/x**2)*(-b**2*log(f)**2 + 2*b*x**2*log(f) - 2*x**4)/(2*b**3*x**4*l
og(f)**3)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^7,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)/x^7, x)
```

Mupad [B]
time = 3.55, size = 47, normalized size = 0.76

$$-\frac{f^{a+\frac{b}{x^2}}\left(\frac{1}{2\,b\,\ln(f)}-\frac{x^2}{b^2\ln(f)^2}+\frac{x^4}{b^3\ln(f)^3}\right)}{x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^7,x)
```

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

3.138 $\int \frac{f^{a+\frac{b}{x^2}}}{x^9}\,dx$

Optimal. Leaf size=86

$$\frac{3f^{a+\frac{b}{x^2}}}{b^4\log^4(f)}-\frac{3f^{a+\frac{b}{x^2}}}{b^3x^2\log^3(f)}+\frac{3f^{a+\frac{b}{x^2}}}{2b^2x^4\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^6\log(f)}$$

```
[Out] 3*f^(a+b/x^2)/b^4/ln(f)^4-3*f^(a+b/x^2)/b^3/x^2/ln(f)^3+3/2*f^(a+b/x^2)/b^2
/x^4/ln(f)^2-1/2*f^(a+b/x^2)/b/x^6/ln(f)
```

Rubi [A]
time = 0.06, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = $\{2243, 2240\}$

$$\frac{3f^{a+\frac{b}{x^2}}}{b^4\log^4(f)}-\frac{3f^{a+\frac{b}{x^2}}}{b^3x^2\log^3(f)}+\frac{3f^{a+\frac{b}{x^2}}}{2b^2x^4\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^6\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^9,x]
```

```
[Out] (3*f^(a + b/x^2))/(b^4*Log[f]^4) - (3*f^(a + b/x^2))/(b^3*x^2*Log[f]^3) + (
3*f^(a + b/x^2))/(2*b^2*x^4*Log[f]^2) - f^(a + b/x^2)/(2*b*x^6*Log[f])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^9}\,dx = -\frac{f^{a+\frac{b}{x^2}}}{2bx^6\log(f)} - \frac{3\int \frac{f^{a+\frac{b}{x^2}}}{x^7}\,dx}{b\log(f)}$$
$$= \frac{3f^{a+\frac{b}{x^2}}}{2b^2x^4\log^2(f)} - \frac{f^{a+\frac{b}{x^2}}}{2bx^6\log(f)} + \frac{6\int \frac{f^{a+\frac{b}{x^2}}}{x^5}\,dx}{b^2\log^2(f)}$$
$$= -\frac{3f^{a+\frac{b}{x^2}}}{b^3x^2\log^3(f)} + \frac{3f^{a+\frac{b}{x^2}}}{2b^2x^4\log^2(f)} - \frac{f^{a+\frac{b}{x^2}}}{2bx^6\log(f)} - \frac{6\int \frac{f^{a+\frac{b}{x^2}}}{x^3}\,dx}{b^3\log^3(f)}$$
$$= \frac{3f^{a+\frac{b}{x^2}}}{b^4\log^4(f)} - \frac{3f^{a+\frac{b}{x^2}}}{b^3x^2\log^3(f)} + \frac{3f^{a+\frac{b}{x^2}}}{2b^2x^4\log^2(f)} - \frac{f^{a+\frac{b}{x^2}}}{2bx^6\log(f)}$$

Mathematica [A]
time = 0.01, size = 58, normalized size = 0.67

$$\frac{f^{a+\frac{b}{x^2}}\left(6x^6 - 6bx^4\log(f) + 3b^2x^2\log^2(f) - b^3\log^3(f)\right)}{2b^4x^6\log^4(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x^9,x]
```

```
[Out] (f^(a + b/x^2)*(6*x^6 - 6*b*x^4*Log[f] + 3*b^2*x^2*Log[f]^2 - b^3*Log[f]^3)
)/(2*b^4*x^6*Log[f]^4)
```

Maple [A]
time = 0.03, size = 59, normalized size = 0.69

method	result	size
meijerg	$-\frac{f^{a}\left(6-\frac{\left(-\frac{4b^{3}\ln(f)^{3}}{x^{6}}+\frac{12b^{2}\ln(f)^{2}}{x^{4}}-\frac{24b\ln(f)}{x^{2}}+24\right)e^{\frac{b\ln(f)}{x^{2}}}}{4}\right)}{2b^{4}\ln(f)^{4}}$	59
risch	$-\frac{\left(\ln(f)^{3}b^{3}-3b^{2}x^{2}\ln(f)^{2}+6b\,x^{4}\ln(f)-6x^{6}\right)f^{\frac{a\,x^{2}+b}{x^{2}}}}{2\ln(f)^{4}b^{4}x^{6}}$	60
norman	$\frac{-\frac{x^{2}e^{\left(a+\frac{b}{x^{2}}\right)\ln(f)}}{2b\ln(f)}+\frac{3x^{4}e^{\left(a+\frac{b}{x^{2}}\right)\ln(f)}}{2b^{2}\ln(f)^{2}}-\frac{3x^{6}e^{\left(a+\frac{b}{x^{2}}\right)\ln(f)}}{b^{3}\ln(f)^{3}}+\frac{3x^{8}e^{\left(a+\frac{b}{x^{2}}\right)\ln(f)}}{b^{4}\ln(f)^{4}}}{x^{8}}$	98

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^9,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*f^a/b^4/ln(f)^4*(6-1/4*(-4*b^3*ln(f)^3/x^6+12*b^2*ln(f)^2/x^4-24*b*ln(
f)/x^2+24)*exp(b*ln(f)/x^2))
```

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 0.32, size = 22, normalized size = 0.26

$$\frac{f^a\Gamma\left(4, -\frac{b\log(f)}{x^2}\right)}{2\,b^4\log\left(f\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^9,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*gamma(4, -b*log(f)/x^2)/(b^4*log(f)^4)
```

Fricas [A]
time = 0.38, size = 60, normalized size = 0.70

$$\frac{\left(6\,x^6-6\,bx^4\log\left(f\right)+3\,b^2x^2\log\left(f\right)^2-b^3\log\left(f\right)^3\right)f^{\frac{ax^2+b}{x^2}}}{2\,b^4x^6\log\left(f\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^9,x, algorithm="fricas")
```

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

Sympy [A]
time = 0.06, size = 58, normalized size = 0.67

$$\frac{f^{a+\frac{b}{x^2}}\left(-b^3\log\left(f\right)^3+3b^2x^2\log\left(f\right)^2-6bx^4\log\left(f\right)+6x^6\right)}{2b^4x^6\log\left(f\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**9,x)
```

```
[Out] f**(a + b/x**2)*(-b**3*log(f)**3 + 3*b**2*x**2*log(f)**2 - 6*b*x**4*log(f)
+ 6*x**6)/(2*b**4*x**6*log(f)**4)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^9,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)/x^9, x)
```

Mupad [B]
time = 3.63, size = 60, normalized size = 0.70

$$-\frac{f^{a+\frac{b}{x^2}}\left(\frac{1}{2\,b\,\ln(f)}-\frac{3\,x^2}{2\,b^2\,\ln(f)^2}+\frac{3\,x^4}{b^3\,\ln(f)^3}-\frac{3\,x^6}{b^4\,\ln(f)^4}\right)}{x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^9,x)
```

```
[Out] -(f^(a + b/x^2)*(1/(2*b*log(f)) - (3*x^2)/(2*b^2*log(f)^2) + (3*x^4)/(b^3*l
og(f)^3) - (3*x^6)/(b^4*log(f)^4)))/x^6
```

3.139 $\int \frac{f^{a+\frac{b}{x^2}}}{x^{11}} \, dx$

Optimal. Leaf size=69

$$-\frac{f^{a+\frac{b}{x^2}} \left(24x^8 - 24bx^6 \log(f) + 12b^2x^4 \log^2(f) - 4b^3x^2 \log^3(f) + b^4 \log^4(f)\right)}{2b^5x^8 \log^5(f)}$$

```
[Out] -1/2*f^(a+b/x^2)*(24*x^8-24*b*x^6*ln(f)+12*b^2*x^4*ln(f)^2-4*b^3*x^2*ln(f)^
3+b^4*ln(f)^4)/b^5/x^8/ln(f)^5
```

Rubi [A]
time = 0.02, antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2249}

$$-\frac{f^{a+\frac{b}{x^2}} \left(b^4 \log^4(f) - 4b^3x^2 \log^3(f) + 12b^2x^4 \log^2(f) - 24bx^6 \log(f) + 24x^8\right)}{2b^5x^8 \log^5(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^11,x]
```

```
[Out] -1/2*(f^(a + b/x^2)*(24*x^8 - 24*b*x^6*Log[f] + 12*b^2*x^4*Log[f]^2 - 4*b^3
*x^2*Log[f]^3 + b^4*Log[f]^4))/(b^5*x^8*Log[f]^5)
```

Rule 2249

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> With[{p = Simplify[(m + 1)/n]}, Simp[(-F^a)*((f/d)^m/(d*n*
((-b)*Log[F])^p))*Simplify[FunctionExpand[Gamma[p, (-b)*(c + d*x)^n*Log[F]]
]], x] /; IGtQ[p, 0]] /; FreeQ[{F, a, b, c, d, e, f, m, n}, x] && EqQ[d*e -
 c*f, 0] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^{11}} \, dx = -\frac{f^a \Gamma\left(5, -\frac{b \log(f)}{x^2}\right)}{2b^5 \log^5(f)}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.00, size = 24, normalized size = 0.35

$$-\frac{f^a \Gamma\left(5, -\frac{b \log(f)}{x^2}\right)}{2b^5 \log^5(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x^11,x]
```

```
[Out] -1/2*(f^a*Gamma[5, -((b*Log[f])/x^2)])/(b^5*Log[f]^5)
```

Maple [A]
time = 0.04, size = 71, normalized size = 1.03

method	result	size
meijerg	$\frac{f^{a}\left(24-\frac{\left(\frac{5 b^{4} \ln\left(f\right)^{4}}{x^{8}}-\frac{20 b^{3} \ln\left(f\right)^{3}}{x^{6}}+\frac{60 b^{2} \ln\left(f\right)^{2}}{x^{4}}-\frac{120 b \ln\left(f\right)}{x^{2}}+120\right) {\mathrm e}^{\frac{b \ln\left(f\right)}{x^{2}}}}{5}\right)}{2 b^{5} \ln\left(f\right)^{5}}$	71
risch	$-\frac{\left(24 x^{8}-24 b \,x^{6} \ln\left(f\right)+12 b^{2} x^{4} \ln\left(f\right)^{2}-4 b^{3} x^{2} \ln\left(f\right)^{3}+b^{4} \ln\left(f\right)^{4}\right) f^{\frac{a \,x^{2}+b}{x^{2}}}}{2 b^{5} \ln\left(f\right)^{5} x^{8}}$	72
norman	$\frac{-\frac{x^{2} {\mathrm e}^{\left(a+\frac{b}{x^{2}}\right) \ln\left(f\right)}}{2 b \ln\left(f\right)}+\frac{2 x^{4} {\mathrm e}^{\left(a+\frac{b}{x^{2}}\right) \ln\left(f\right)}}{b^{2} \ln\left(f\right)^{2}}-\frac{6 x^{6} {\mathrm e}^{\left(a+\frac{b}{x^{2}}\right) \ln\left(f\right)}}{b^{3} \ln\left(f\right)^{3}}+\frac{12 x^{8} {\mathrm e}^{\left(a+\frac{b}{x^{2}}\right) \ln\left(f\right)}}{b^{4} \ln\left(f\right)^{4}}-\frac{12 x^{10} {\mathrm e}^{\left(a+\frac{b}{x^{2}}\right) \ln\left(f\right)}}{b^{5} \ln\left(f\right)^{5}}}{x^{10}}$	121

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^11,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*f^a/b^5/ln(f)^5*(24-1/5*(5*b^4*ln(f)^4/x^8-20*b^3*ln(f)^3/x^6+60*b^2*ln
(f)^2/x^4-120*b*ln(f)/x^2+120)*exp(b*ln(f)/x^2))
```

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 0.32, size = 22, normalized size = 0.32

$$-\frac{f^{a}\Gamma\left(5,-\frac{b\log\left(f\right)}{x^{2}}\right)}{2\,b^{5}\log\left(f\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^11,x, algorithm="maxima")
```

```
[Out] -1/2*f^a*gamma(5, -b*log(f)/x^2)/(b^5*log(f)^5)
```

Fricas [A]
time = 0.39, size = 71, normalized size = 1.03

$$-\frac{\left(24\,x^{8}-24\,bx^{6}\log\left(f\right)+12\,b^{2}x^{4}\log\left(f\right)^{2}-4\,b^{3}x^{2}\log\left(f\right)^{3}+b^{4}\log\left(f\right)^{4}\right)f^{\frac{ax^{2}+b}{x^{2}}}}{2\,b^{5}x^{8}\log\left(f\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^11,x, algorithm="fricas")
```

```
[Out] -1/2*(24*x^8 - 24*b*x^6*log(f) + 12*b^2*x^4*log(f)^2 - 4*b^3*x^2*log(f)^3 +
 b^4*log(f)^4)*f^((a*x^2 + b)/x^2)/(b^5*x^8*log(f)^5)
```

Sympy [A]

time = 0.07, size = 71, normalized size = 1.03

$$\frac{f^{a+\frac{b}{x^2}}\left(-b^4\log\left(f\right)^4+4b^3x^2\log\left(f\right)^3-12b^2x^4\log\left(f\right)^2+24bx^6\log\left(f\right)-24x^8\right)}{2b^5x^8\log\left(f\right)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**11,x)
```

```
[Out] f**(a + b/x**2)*(-b**4*log(f)**4 + 4*b**3*x**2*log(f)**3 - 12*b**2*x**4*log
(f)**2 + 24*b*x**6*log(f) - 24*x**8)/(2*b**5*x**8*log(f)**5)
```

Giac [F]

time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^11,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)/x^11, x)
```

Mupad [B]

time = 3.60, size = 72, normalized size = 1.04

$$-\frac{f^{a+\frac{b}{x^2}}\left(\frac{1}{2\,b\,\ln(f)}-\frac{2\,x^2}{b^2\ln(f)^2}+\frac{6\,x^4}{b^3\ln(f)^3}-\frac{12\,x^6}{b^4\ln(f)^4}+\frac{12\,x^8}{b^5\ln(f)^5}\right)}{x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^11,x)
```

```
[Out] -(f^(a + b/x^2)*(1/(2*b*log(f)) - (2*x^2)/(b^2*log(f)^2) + (6*x^4)/(b^3*log
(f)^3) - (12*x^6)/(b^4*log(f)^4) + (12*x^8)/(b^5*log(f)^5)))/x^8
```

3.140 $\int \frac{f^{a+\frac{b}{x^2}}}{x^{13}} \, dx$

Optimal. Leaf size=82

$$\frac{f^{a+\frac{b}{x^2}} \left(120x^{10} - 120bx^8 \log(f) + 60b^2x^6 \log^2(f) - 20b^3x^4 \log^3(f) + 5b^4x^2 \log^4(f) - b^5 \log^5(f)\right)}{2b^6x^{10} \log^6(f)}$$

```
[Out] 1/2*f^(a+b/x^2)*(120*x^10-120*b*x^8*ln(f)+60*b^2*x^6*ln(f)^2-20*b^3*x^4*ln(
f)^3+5*b^4*x^2*ln(f)^4-b^5*ln(f)^5)/b^6/x^10/ln(f)^6
```

Rubi [A]
time = 0.03, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2249}

$$\frac{f^{a+\frac{b}{x^2}} \left(-b^5 \log^5(f) + 5b^4x^2 \log^4(f) - 20b^3x^4 \log^3(f) + 60b^2x^6 \log^2(f) - 120bx^8 \log(f) + 120x^{10}\right)}{2b^6x^{10} \log^6(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^13,x]
```

```
[Out] (f^(a + b/x^2)*(120*x^10 - 120*b*x^8*Log[f] + 60*b^2*x^6*Log[f]^2 - 20*b^3*
x^4*Log[f]^3 + 5*b^4*x^2*Log[f]^4 - b^5*Log[f]^5))/(2*b^6*x^10*Log[f]^6)
```

Rule 2249

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> With[{p = Simplify[(m + 1)/n]}, Simp[(-F^a)*((f/d)^m/(d*n*
((-b)*Log[F])^p))*Simplify[FunctionExpand[Gamma[p, (-b)*(c + d*x)^n*Log[F]]
]], x] /; IGtQ[p, 0]] /; FreeQ[{F, a, b, c, d, e, f, m, n}, x] && EqQ[d*e -
 c*f, 0] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^{13}} \, dx = \frac{f^a \Gamma\left(6, -\frac{b \log(f)}{x^2}\right)}{2b^6 \log^6(f)}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.00, size = 24, normalized size = 0.29

$$\frac{f^a \Gamma\left(6, -\frac{b \log(f)}{x^2}\right)}{2b^6 \log^6(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x^13,x]
[Out] (f^a*Gamma[6, -((b*Log[f])/x^2)])/(2*b^6*Log[f]^6)
```

Maple [A]
time = 0.04, size = 83, normalized size = 1.01

method	result	siz
meijerg	$-\frac{f^{a}\left(120-\frac{\left(-\frac{6 b^{5} \ln \left(f\right)^{5}}{x^{10}}+\frac{30 b^{4} \ln \left(f\right)^{4}}{x^{8}}-\frac{120 b^{3} \ln \left(f\right)^{3}}{x^{6}}+\frac{360 b^{2} \ln \left(f\right)^{2}}{x^{4}}-\frac{720 b \ln \left(f\right)}{x^{2}}+720\right) {\mathrm e}^{\frac{b \ln \left(f\right)}{x^{2}}}}{6}\right)}{2 b^{6} \ln \left(f\right)^{6}}$	83
risch	$-\frac{\left(b^{5} \ln \left(f\right)^{5}-5 b^{4} x^{2} \ln \left(f\right)^{4}+20 b^{3} x^{4} \ln \left(f\right)^{3}-60 b^{2} x^{6} \ln \left(f\right)^{2}+120 b\, x^{8} \ln \left(f\right)-120 x^{10}\right) f^{\frac{a\, x^{2}+b}{x^{2}}}}{2 b^{6} \ln \left(f\right)^{6} x^{10}}$	84
norman	$\frac{\frac{60 x^{12} {\mathrm e}^{\left(a+\frac{b}{x^{2}}\right) \ln \left(f\right)}}{b^{6} \ln \left(f\right)^{6}}-\frac{x^{2} {\mathrm e}^{\left(a+\frac{b}{x^{2}}\right) \ln \left(f\right)}}{2 b \ln \left(f\right)}+\frac{5 x^{4} {\mathrm e}^{\left(a+\frac{b}{x^{2}}\right) \ln \left(f\right)}}{2 b^{2} \ln \left(f\right)^{2}}-\frac{10 x^{6} {\mathrm e}^{\left(a+\frac{b}{x^{2}}\right) \ln \left(f\right)}}{b^{3} \ln \left(f\right)^{3}}+\frac{30 x^{8} {\mathrm e}^{\left(a+\frac{b}{x^{2}}\right) \ln \left(f\right)}}{b^{4} \ln \left(f\right)^{4}}-\frac{60 x^{10} {\mathrm e}^{\left(a+\frac{b}{x^{2}}\right) \ln \left(f\right)}}{b^{5} \ln \left(f\right)^{5}}}{x^{12}}$	14

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^13,x,method=_RETURNVERBOSE)
[Out] -1/2*f^a/b^6/ln(f)^6*(120-1/6*(-6*b^5*ln(f)^5/x^10+30*b^4*ln(f)^4/x^8-120*b
^3*ln(f)^3/x^6+360*b^2*ln(f)^2/x^4-720*b*ln(f)/x^2+720)*exp(b*ln(f)/x^2))
```

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 0.33, size = 22, normalized size = 0.27

$$\frac{f^{a}\Gamma\left(6, -\frac{b \log\left(f\right)}{x^{2}}\right)}{2 \, b^{6} \log\left(f\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^13,x, algorithm="maxima")
[Out] 1/2*f^a*gamma(6, -b*log(f)/x^2)/(b^6*log(f)^6)
```

Fricas [A]
time = 0.35, size = 84, normalized size = 1.02

$$\frac{\left(120 \, x^{10} - 120 \, b x^{8} \log\left(f\right) + 60 \, b^{2} x^{6} \log\left(f\right)^{2} - 20 \, b^{3} x^{4} \log\left(f\right)^{3} + 5 \, b^{4} x^{2} \log\left(f\right)^{4} - b^{5} \log\left(f\right)^{5}\right)} f^{\frac{a x^{2} + b}{x^{2}}}}{2 \, b^{6} x^{10} \log\left(f\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^13,x, algorithm="fricas")
```

```
[Out] 1/2*(120*x^10 - 120*b*x^8*log(f) + 60*b^2*x^6*log(f)^2 - 20*b^3*x^4*log(f)^
3 + 5*b^4*x^2*log(f)^4 - b^5*log(f)^5)*f^((a*x^2 + b)/x^2)/(b^6*x^10*log(f)
^6)
```

Sympy [A]
time = 0.07, size = 85, normalized size = 1.04

$$\frac{f^{a+\frac{b}{x^2}}\left(-b^5\log\left(f\right)^5+5b^4x^2\log\left(f\right)^4-20b^3x^4\log\left(f\right)^3+60b^2x^6\log\left(f\right)^2-120bx^8\log\left(f\right)+120x^{10}\right)}{2b^6x^{10}\log\left(f\right)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**13,x)
```

```
[Out] f**(a + b/x**2)*(-b**5*log(f)**5 + 5*b**4*x**2*log(f)**4 - 20*b**3*x**4*log
(f)**3 + 60*b**2*x**6*log(f)**2 - 120*b*x**8*log(f) + 120*x**10)/(2*b**6*x*
*10*log(f)**6)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^13,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)/x^13, x)
```

Mupad [B]
time = 3.61, size = 84, normalized size = 1.02

$$-\frac{f^{a+\frac{b}{x^2}}\left(\frac{1}{2\,b\,\ln(f)}-\frac{5\,x^2}{2\,b^2\,\ln(f)^2}+\frac{10\,x^4}{b^3\,\ln(f)^3}-\frac{30\,x^6}{b^4\,\ln(f)^4}+\frac{60\,x^8}{b^5\,\ln(f)^5}-\frac{60\,x^{10}}{b^6\,\ln(f)^6}\right)}{x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^13,x)
```

```
[Out] -(f^(a + b/x^2)*(1/(2*b*log(f)) - (5*x^2)/(2*b^2*log(f)^2) + (10*x^4)/(b^3*
log(f)^3) - (30*x^6)/(b^4*log(f)^4) + (60*x^8)/(b^5*log(f)^5) - (60*x^10)/(
b^6*log(f)^6)))/x^10
```

3.141 $\int f^{a+\frac{b}{x^2}} x^{10}\,dx$

Optimal. Leaf size=34

$$\frac{1}{2}f^a x^{11}\Gamma\left(-\frac{11}{2},-\frac{b\log(f)}{x^2}\right)\left(-\frac{b\log(f)}{x^2}\right)^{11/2}$$

```
[Out] 1/2*f^a*x^11*(64/10395*Pi^(1/2)*erfc((-b*ln(f)/x^2)^(1/2))-64/10395/(-b*ln(
f)/x^2)^(1/2)*exp(b*ln(f)/x^2)+32/10395/(-b*ln(f)/x^2)^(3/2)*exp(b*ln(f)/x^
2)-16/3465/(-b*ln(f)/x^2)^(5/2)*exp(b*ln(f)/x^2)+8/693/(-b*ln(f)/x^2)^(7/2)
*exp(b*ln(f)/x^2)-4/99/(-b*ln(f)/x^2)^(9/2)*exp(b*ln(f)/x^2)+2/11/(-b*ln(f)
/x^2)^(11/2)*exp(b*ln(f)/x^2))*(-b*ln(f)/x^2)^(11/2)
```

Rubi [A]
time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$\frac{1}{2}x^{11}f^a\left(-\frac{b\log(f)}{x^2}\right)^{11/2}\text{Gamma}\left(-\frac{11}{2},-\frac{b\log(f)}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)*x^10,x]
```

```
[Out] (f^a*x^11*Gamma[-11/2, -((b*Log[f])/x^2)]*(-((b*Log[f])/x^2))^(11/2))/2
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x^2}} x^{10}\,dx = \frac{1}{2}f^a x^{11}\Gamma\left(-\frac{11}{2},-\frac{b\log(f)}{x^2}\right)\left(-\frac{b\log(f)}{x^2}\right)^{11/2}$$

Mathematica [A]
time = 0.00, size = 34, normalized size = 1.00

$$\frac{1}{2}f^a x^{11}\Gamma\left(-\frac{11}{2},-\frac{b\log(f)}{x^2}\right)\left(-\frac{b\log(f)}{x^2}\right)^{11/2}$$

Antiderivative was successfully verified.

[In] Integrate[f^(a + b/x^2)*x^10,x]

[Out] (f^a*x^11*Gamma[-11/2, -((b*Log[f])/x^2)]*(-((b*Log[f])/x^2))^(11/2))/2

Maple [A]
time = 0.09, size = 124, normalized size = 3.65

method	result
meijerg	$\frac{f^{a} b^{5} \ln(f)^{\frac{11}{2}} \sqrt{-b}\left(-\frac{2x^{11}\left(\frac{32b^{5}\ln(f)^{5}}{945x^{10}}+\frac{16b^{4}\ln(f)^{4}}{945x^{8}}+\frac{8b^{3}\ln(f)^{3}}{315x^{6}}+\frac{4b^{2}\ln(f)^{2}}{63x^{4}}+\frac{2b\ln(f)}{9x^{2}}+1\right)e^{\frac{b\ln(f)}{x^{2}}}}{11(-b)^{\frac{11}{2}}\ln(f)^{\frac{11}{2}}}+\frac{64b^{\frac{11}{2}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\sqrt{\ln(f)}}{x}\right)}{10395(-b)^{\frac{11}{2}}}\right)}{2}$
risch	$\frac{f^{a}x^{11}f^{\frac{b}{x^{2}}}}{11}+\frac{2f^{a}\ln(f)b\,x^{9}f^{\frac{b}{x^{2}}}}{99}+\frac{4f^{a}\ln(f)^{2}b^{2}x^{7}f^{\frac{b}{x^{2}}}}{693}+\frac{8f^{a}\ln(f)^{3}b^{3}x^{5}f^{\frac{b}{x^{2}}}}{3465}+\frac{16f^{a}\ln(f)^{4}b^{4}x^{3}f^{\frac{b}{x^{2}}}}{10395}+\frac{32f^{a}\ln(f)^{5}b^{5}x\,f^{\frac{b}{x^{2}}}}{10395}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(f^(a+b/x^2)*x^10,x,method=_RETURNVERBOSE)

[Out] 1/2*f^a*b^5*ln(f)^(11/2)*(-b)^(1/2)*(-2/11*x^11/(-b)^(11/2)/ln(f)^(11/2)*(3
2/945*b^5*ln(f)^5/x^10+16/945*b^4*ln(f)^4/x^8+8/315*b^3*ln(f)^3/x^6+4/63*b^
2*ln(f)^2/x^4+2/9*b*ln(f)/x^2+1)*exp(b*ln(f)/x^2)+64/10395/(-b)^(11/2)*b^(1
1/2)*Pi^(1/2)*erfi(b^(1/2)*ln(f)^(1/2)/x))

Maxima [A]
time = 0.33, size = 28, normalized size = 0.82

$$\frac{1}{2}\, f^{a} x^{11} \left(-\frac{b\log(f)}{x^{2}}\right)^{\frac{11}{2}} \Gamma\left(-\frac{11}{2}, -\frac{b\log(f)}{x^{2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(a+b/x^2)*x^10,x, algorithm="maxima")

[Out] 1/2*f^a*x^11*(-b*log(f)/x^2)^(11/2)*gamma(-11/2, -b*log(f)/x^2)

Fricas [A]
time = 0.43, size = 110, normalized size = 3.24

$$\frac{32}{10395}\sqrt{\pi}\sqrt{-b\log(f)}\, b^{5} f^{a}\,\mathrm{erf}\left(\frac{\sqrt{-b\log(f)}}{x}\right)\log(f)^{5}+\frac{1}{10395}\left(945\,x^{11}+210\,bx^{9}\log(f)+60\,b^{2}x^{7}\log(f)^{2}+24\,b^{3}x^{5}\log(f)^{3}+16\,b^{4}x^{3}\log(f)^{4}+32\,b^{5}x\log(f)^{5}\right)f^{\frac{ax^{2}+b}{x^{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(a+b/x^2)*x^10,x, algorithm="fricas")

```
[Out] 32/10395*sqrt(pi)*sqrt(-b*log(f))*b^5*f^a*erf(sqrt(-b*log(f))/x)*log(f)^5 +
 1/10395*(945*x^11 + 210*b*x^9*log(f) + 60*b^2*x^7*log(f)^2 + 24*b^3*x^5*lo
g(f)^3 + 16*b^4*x^3*log(f)^4 + 32*b^5*x*log(f)^5)*f^((a*x^2 + b)/x^2)
```

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

$$\int f^{a+\frac{b}{x^2}}x^{10}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)*x**10,x)
```

```
[Out] Integral(f**(a + b/x**2)*x**10, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^10,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)*x^10, x)
```

Mupad [B]
time = 3.66, size = 173, normalized size = 5.09

$$\frac{f^a\,f^{\frac{b}{x^2}}\,x^{11}}{11}-\frac{32\,f^a\,x^{11}\,\sqrt{\pi }\,{\left(-\frac{b\,\ln (f)}{x^2}\right)}^{11/2}}{10395}+\frac{32\,f^a\,x^{11}\,\sqrt{\pi }\,\mathrm{erfc}\left(\sqrt{-\frac{b\,\ln \left(f\right)}{x^2}}\right)\,{\left(-\frac{b\,\ln (f)}{x^2}\right)}^{11/2}}{10395}+\frac{32\,b^5\,f^a\,f^{\frac{b}{x^2}}\,x\,{\ln \left(f\right)}^5}{10395}+\frac{4\,b^2\,f^a\,f^{\frac{b}{x^2}}\,x^7\,{\ln \left(f\right)}^2}{693}+\frac{8\,b^3\,f^a\,f^{\frac{b}{x^2}}\,x^5\,{\ln \left(f\right)}^3}{3465}+\frac{16\,b^4\,f^a\,f^{\frac{b}{x^2}}\,x^3\,{\ln \left(f\right)}^4}{10395}+\frac{2\,b\,f^a\,f^{\frac{b}{x^2}}\,x^9\,\ln \left(f\right)}{99}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)*x^10,x)
```

```
[Out] (f^a*f^(b/x^2)*x^11)/11 - (32*f^a*x^11*pi^(1/2)*(-(b*log(f))/x^2)^(11/2))/1
0395 + (32*f^a*x^11*pi^(1/2)*erfc((-(b*log(f))/x^2)^(1/2))*(-(b*log(f))/x^2
)^(11/2))/10395 + (32*b^5*f^a*f^(b/x^2)*x*log(f)^5)/10395 + (4*b^2*f^a*f^(b
/x^2)*x^7*log(f)^2)/693 + (8*b^3*f^a*f^(b/x^2)*x^5*log(f)^3)/3465 + (16*b^4
*f^a*f^(b/x^2)*x^3*log(f)^4)/10395 + (2*b*f^a*f^(b/x^2)*x^9*log(f))/99
```

3.142 $\int f^{a+\frac{b}{x^2}} x^8 \, dx$

Optimal. Leaf size=34

$$\frac{1}{2} f^a x^9 \Gamma\left(-\frac{9}{2}, -\frac{b \log(f)}{x^2}\right) \left(-\frac{b \log(f)}{x^2}\right)^{9/2}$$

```
[Out] 1/2*f^a*x^9*(-32/945*Pi^(1/2)*erfc((-b*ln(f)/x^2)^(1/2))+32/945/(-b*ln(f)/x
^2)^(1/2)*exp(b*ln(f)/x^2)-16/945/(-b*ln(f)/x^2)^(3/2)*exp(b*ln(f)/x^2)+8/3
15/(-b*ln(f)/x^2)^(5/2)*exp(b*ln(f)/x^2)-4/63/(-b*ln(f)/x^2)^(7/2)*exp(b*ln
(f)/x^2)+2/9/(-b*ln(f)/x^2)^(9/2)*exp(b*ln(f)/x^2))*(-b*ln(f)/x^2)^(9/2)
```

Rubi [A]
time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$\frac{1}{2} x^9 f^a \left(-\frac{b \log(f)}{x^2}\right)^{9/2} \text{Gamma}\left(-\frac{9}{2}, -\frac{b \log(f)}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)*x^8,x]
```

```
[Out] (f^a*x^9*Gamma[-9/2, -((b*Log[f])/x^2)]*(-((b*Log[f])/x^2))^(9/2))/2
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x^2}} x^8 \, dx = \frac{1}{2} f^a x^9 \Gamma\left(-\frac{9}{2}, -\frac{b \log(f)}{x^2}\right) \left(-\frac{b \log(f)}{x^2}\right)^{9/2}$$

Mathematica [A]
time = 0.00, size = 34, normalized size = 1.00

$$\frac{1}{2} f^a x^9 \Gamma\left(-\frac{9}{2}, -\frac{b \log(f)}{x^2}\right) \left(-\frac{b \log(f)}{x^2}\right)^{9/2}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)*x^8,x]
```

```
[Out] (f^a*x^9*Gamma[-9/2, -((b*Log[f])/x^2)]*(-((b*Log[f])/x^2))^(9/2))/2
```

Maple [A]
time = 0.04, size = 112, normalized size = 3.29

method	result
meijerg	$-\frac{f^{a} b^{4} \ln(f)^{\frac{9}{2}} \sqrt{-b}\, \left(-\frac{2 x^{9} \left(\frac{16 b^{4} \ln(f)^{4}}{105 x^{8}}+\frac{8 b^{3} \ln(f)^{3}}{105 x^{6}}+\frac{4 b^{2} \ln(f)^{2}}{35 x^{4}}+\frac{2 b \ln(f)}{7 x^{2}}+1\right) \mathrm{e}^{\frac{b \ln(f)}{x^{2}}}}{9 (-b)^{\frac{9}{2}} \ln(f)^{\frac{9}{2}}}+\frac{32 b^{\frac{9}{2}} \sqrt{\pi}\, \mathrm{erfi}\left(\frac{\sqrt{b}\, \sqrt{\ln(f)}}{x}\right)}{945 (-b)^{\frac{9}{2}}}\right)}{2}$
risch	$\frac{f^{a} x^{9} f^{\frac{b}{x^{2}}}}{9}+\frac{2 f^{a} \ln(f) b x^{7} f^{\frac{b}{x^{2}}}}{63}+\frac{4 f^{a} \ln(f)^{2} b^{2} x^{5} f^{\frac{b}{x^{2}}}}{315}+\frac{8 f^{a} \ln(f)^{3} b^{3} x^{3} f^{\frac{b}{x^{2}}}}{945}+\frac{16 f^{a} \ln(f)^{4} b^{4} x f^{\frac{b}{x^{2}}}}{945}-\frac{16 f^{a} \ln(f)^{5} b^{5} \sqrt{\pi}\, \mathrm{e}}{945 \sqrt{-}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)*x^8,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*f^a*b^4*ln(f)^(9/2)*(-b)^(1/2)*(-2/9*x^9/(-b)^(9/2)/ln(f)^(9/2)*(16/10
5*b^4*ln(f)^4/x^8+8/105*b^3*ln(f)^3/x^6+4/35*b^2*ln(f)^2/x^4+2/7*b*ln(f)/x^
2+1)*exp(b*ln(f)/x^2)+32/945/(-b)^(9/2)*b^(9/2)*Pi^(1/2)*erfi(b^(1/2)*ln(f)
^(1/2)/x))
```

Maxima [A]
time = 0.32, size = 28, normalized size = 0.82

$$\frac{1}{2} f^{a} x^{9} \left(-\frac{b \log(f)}{x^{2}}\right)^{\frac{9}{2}} \Gamma\left(-\frac{9}{2}, -\frac{b \log(f)}{x^{2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^8,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*x^9*(-b*log(f)/x^2)^(9/2)*gamma(-9/2, -b*log(f)/x^2)
```

Fricas [A]
time = 0.39, size = 98, normalized size = 2.88

$$\frac{16}{945} \sqrt{\pi} \sqrt{-b \log(f)}\, b^{4} f^{a} \operatorname{erf}\left(\frac{\sqrt{-b \log(f)}}{x}\right) \log(f)^{4} + \frac{1}{945} \left(105 x^{9} + 30 b x^{7} \log(f) + 12 b^{2} x^{5} \log(f)^{2} + 8 b^{3} x^{3} \log(f)^{3} + 16 b^{4} x \log(f)^{4}\right) f^{\frac{a x^{2}+b}{x^{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^8,x, algorithm="fricas")
```

```
[Out] 16/945*sqrt(pi)*sqrt(-b*log(f))*b^4*f^a*erf(sqrt(-b*log(f))/x)*log(f)^4 + 1
/945*(105*x^9 + 30*b*x^7*log(f) + 12*b^2*x^5*log(f)^2 + 8*b^3*x^3*log(f)^3
+ 16*b^4*x*log(f)^4)*f^((a*x^2 + b)/x^2)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}}x^8\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)*x**8,x)
```

```
[Out] Integral(f**(a + b/x**2)*x**8, x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^8,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)*x^8, x)
```

Mupad [**B**]
time = 3.66, size = 151, normalized size = 4.44

$$\frac{f^a\,f^{\frac{b}{x^2}}\,x^9}{9}+\frac{16\,f^a\,x^9\,\sqrt{\pi}\,{\left(-\frac{b\,\ln(f)}{x^2}\right)}^{9/2}}{945}-\frac{16\,f^a\,x^9\,\sqrt{\pi}\,\mathrm{erfc}\left(\sqrt{-\frac{b\,\ln\left(f\right)}{x^2}}\right)\,{\left(-\frac{b\,\ln(f)}{x^2}\right)}^{9/2}}{945}+\frac{16\,b^4\,f^a\,f^{\frac{b}{x^2}}\,x\,\ln\left(f\right)^4}{945}+\frac{4\,b^2\,f^a\,f^{\frac{b}{x^2}}\,x^5\,\ln\left(f\right)^2}{315}+\frac{8\,b^3\,f^a\,f^{\frac{b}{x^2}}\,x^3\,\ln\left(f\right)^3}{945}+\frac{2\,b\,f^a\,f^{\frac{b}{x^2}}\,x^7\,\ln\left(f\right)}{63}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)*x^8,x)
```

```
[Out] (f^a*f^(b/x^2)*x^9)/9 + (16*f^a*x^9*pi^(1/2)*(-(b*log(f))/x^2)^(9/2))/945 -
 (16*f^a*x^9*pi^(1/2)*erfc((-(b*log(f))/x^2)^(1/2))*(-(b*log(f))/x^2)^(9/2)
)/945 + (16*b^4*f^a*f^(b/x^2)*x*log(f)^4)/945 + (4*b^2*f^a*f^(b/x^2)*x^5*lo
g(f)^2)/315 + (8*b^3*f^a*f^(b/x^2)*x^3*log(f)^3)/945 + (2*b*f^a*f^(b/x^2)*x
^7*log(f))/63
```

3.143 $\int f^{a+\frac{b}{x^2}} x^6 \, dx$

Optimal. Leaf size=119

$$\frac{1}{7}f^{a+\frac{b}{x^2}}x^7+\frac{2}{35}bf^{a+\frac{b}{x^2}}x^5\log(f)+\frac{4}{105}b^2f^{a+\frac{b}{x^2}}x^3\log^2(f)+\frac{8}{105}b^3f^{a+\frac{b}{x^2}}x\log^3(f)-\frac{8}{105}b^{7/2}f^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right.$$

```
[Out] 1/7*f^(a+b/x^2)*x^7+2/35*b*f^(a+b/x^2)*x^5*ln(f)+4/105*b^2*f^(a+b/x^2)*x^3*
ln(f)^2+8/105*b^3*f^(a+b/x^2)*x*ln(f)^3-8/105*b^(7/2)*f^a*erfi(b^(1/2)*ln(f
)^(1/2)/x)*ln(f)^(7/2)*Pi^(1/2)
```

Rubi [A]
time = 0.09, antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$, Rules used = {2245, 2237, 2242, 2235}

$$-\frac{8}{105}\sqrt{\pi}\,b^{7/2}f^a\log^{\frac{7}{2}}(f)\text{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)+\frac{8}{105}b^3x\log^3(f)f^{a+\frac{b}{x^2}}+\frac{4}{105}b^2x^3\log^2(f)f^{a+\frac{b}{x^2}}+\frac{1}{7}x^7f^{a+\frac{b}{x^2}}+\frac{2}{35}bx^5\log(f)f^{a+\frac{b}{x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)*x^6,x]
```

```
[Out] (f^(a + b/x^2)*x^7)/7 + (2*b*f^(a + b/x^2)*x^5*Log[f])/35 + (4*b^2*f^(a + b
/x^2)*x^3*Log[f]^2)/105 + (8*b^3*f^(a + b/x^2)*x*Log[f]^3)/105 - (8*b^(7/2)
*f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x]*Log[f]^(7/2))/105
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int f^{a+\frac{b}{x^2}}x^6\,dx &= \frac{1}{7}f^{a+\frac{b}{x^2}}x^7+\frac{1}{7}(2b\log(f))\int f^{a+\frac{b}{x^2}}x^4\,dx\\ &= \frac{1}{7}f^{a+\frac{b}{x^2}}x^7+\frac{2}{35}bf^{a+\frac{b}{x^2}}x^5\log(f)+\frac{1}{35}\left(4b^2\log^2(f)\right)\int f^{a+\frac{b}{x^2}}x^2\,dx\\ &= \frac{1}{7}f^{a+\frac{b}{x^2}}x^7+\frac{2}{35}bf^{a+\frac{b}{x^2}}x^5\log(f)+\frac{4}{105}b^2f^{a+\frac{b}{x^2}}x^3\log^2(f)+\frac{1}{105}\left(8b^3\log^3(f)\right)\int f^{a+\frac{b}{x^2}}\,dx\\ &= \frac{1}{7}f^{a+\frac{b}{x^2}}x^7+\frac{2}{35}bf^{a+\frac{b}{x^2}}x^5\log(f)+\frac{4}{105}b^2f^{a+\frac{b}{x^2}}x^3\log^2(f)+\frac{8}{105}b^3f^{a+\frac{b}{x^2}}x\log^3(f)+\frac{1}{105}(16b\\ &= \frac{1}{7}f^{a+\frac{b}{x^2}}x^7+\frac{2}{35}bf^{a+\frac{b}{x^2}}x^5\log(f)+\frac{4}{105}b^2f^{a+\frac{b}{x^2}}x^3\log^2(f)+\frac{8}{105}b^3f^{a+\frac{b}{x^2}}x\log^3(f)-\frac{1}{105}(16b\\ &= \frac{1}{7}f^{a+\frac{b}{x^2}}x^7+\frac{2}{35}bf^{a+\frac{b}{x^2}}x^5\log(f)+\frac{4}{105}b^2f^{a+\frac{b}{x^2}}x^3\log^2(f)+\frac{8}{105}b^3f^{a+\frac{b}{x^2}}x\log^3(f)-\frac{8}{105}b^{7/2}f\end{aligned}$$

Mathematica [A]
time = 0.03, size = 86, normalized size = 0.72

$$\frac{1}{105}f^a\left(-8b^{7/2}\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)\log^{\frac{7}{2}}(f)+f^{\frac{b}{x^2}}x\left(15x^6+6bx^4\log(f)+4b^2x^2\log^2(f)+8b^3\log^3(f)\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)*x^6,x]
```

```
[Out] (f^a*(-8*b^(7/2)*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x]*Log[f]^(7/2) + f^(
b/x^2)*x*(15*x^6 + 6*b*x^4*Log[f] + 4*b^2*x^2*Log[f]^2 + 8*b^3*Log[f]^3)))/
105
```

Maple [A]
time = 0.03, size = 100, normalized size = 0.84

method	result	si

meijerg	$\frac{f^a \ln(f)^{\frac{7}{2}} b^3 \sqrt{-b}\left(-\frac{2x^7\left(\frac{8b^3\ln(f)^3}{15x^6}+\frac{4b^2\ln(f)^2}{15x^4}+\frac{2b\ln(f)}{5x^2}+1\right)e^{\frac{b\ln(f)}{x^2}}}{7(-b)^{\frac{7}{2}}\ln(f)^{\frac{7}{2}}}+\frac{16b^{\frac{7}{2}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\,\sqrt{\ln(f)}}{x}\right)}{105(-b)^{\frac{7}{2}}}\right)}{2}$
risch	$\frac{f^a x^7 f^{\frac{b}{x^2}}}{7}+\frac{2f^a\ln(f)b\,x^5 f^{\frac{b}{x^2}}}{35}+\frac{4f^a\ln(f)^2 b^2x^3 f^{\frac{b}{x^2}}}{105}+\frac{8f^a\ln(f)^3b^3x\,f^{\frac{b}{x^2}}}{105}-\frac{8f^a\ln(f)^4b^4\sqrt{\pi}\,\mathrm{erf}\left(\frac{\sqrt{-b\ln(f)}}{x}\right)}{105\sqrt{-b\ln(f)}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)*x^6,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*f^a*ln(f)^(7/2)*b^3*(-b)^(1/2)*(-2/7*x^7/(-b)^(7/2)/ln(f)^(7/2)*(8/15*b
^3*ln(f)^3/x^6+4/15*b^2*ln(f)^2/x^4+2/5*b*ln(f)/x^2+1)*exp(b*ln(f)/x^2)+16/
105/(-b)^(7/2)*b^(7/2)*Pi^(1/2)*erfi(b^(1/2)*ln(f)^(1/2)/x))
```

Maxima [A]
time = 0.32, size = 28, normalized size = 0.24

$$\frac{1}{2}\,f^a x^7\left(-\frac{b\log(f)}{x^2}\right)^{\frac{7}{2}}\Gamma\left(-\frac{7}{2},-\frac{b\log(f)}{x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^6,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*x^7*(-b*log(f)/x^2)^(7/2)*gamma(-7/2, -b*log(f)/x^2)
```

Fricas [A]
time = 0.41, size = 86, normalized size = 0.72

$$\frac{8}{105}\sqrt{\pi}\sqrt{-b\log(f)}\,b^3f^a\,\mathrm{erf}\left(\frac{\sqrt{-b\log(f)}}{x}\right)\log(f)^3+\frac{1}{105}\left(15\,x^7+6\,bx^5\log(f)+4\,b^2x^3\log(f)^2+8\,b^3x\log(f)^3\right)f^{\frac{ax^2+b}{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^6,x, algorithm="fricas")
```

```
[Out] 8/105*sqrt(pi)*sqrt(-b*log(f))*b^3*f^a*erf(sqrt(-b*log(f))/x)*log(f)^3 + 1/
105*(15*x^7 + 6*b*x^5*log(f) + 4*b^2*x^3*log(f)^2 + 8*b^3*x*log(f)^3)*f^((a
*x^2 + b)/x^2)
```

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

$$\int f^{a+\frac{b}{x^2}}x^6\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)*x**6,x)
```

```
[Out] Integral(f**(a + b/x**2)*x**6, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^6,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)*x^6, x)
```

Mupad [B]
time = 3.66, size = 129, normalized size = 1.08

$$\frac{f^a\,f^{\frac{b}{x^2}}\,x^7}{7}-\frac{8\,f^a\,x^7\,\sqrt{\pi}\,{\left(-\frac{b\,\ln(f)}{x^2}\right)}^{7/2}}{105}+\frac{8\,f^a\,x^7\,\sqrt{\pi}\,\mathrm{erfc}\left(\sqrt{-\frac{b\,\ln\left(f\right)}{x^2}}\right)\,{\left(-\frac{b\,\ln(f)}{x^2}\right)}^{7/2}}{105}+\frac{8\,b^3\,f^a\,f^{\frac{b}{x^2}}\,x\,{\ln\left(f\right)}^3}{105}+\frac{4\,b^2\,f^a\,f^{\frac{b}{x^2}}\,x^3\,{\ln\left(f\right)}^2}{105}+\frac{2\,b\,f^a\,f^{\frac{b}{x^2}}\,x^5\,\ln\left(f\right)}{35}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)*x^6,x)
```

```
[Out] (f^a*f^(b/x^2)*x^7)/7 - (8*f^a*x^7*pi^(1/2)*(-(b*log(f))/x^2)^(7/2))/105 +
(8*f^a*x^7*pi^(1/2)*erfc((-(b*log(f))/x^2)^(1/2))*(-(b*log(f))/x^2)^(7/2))/
105 + (8*b^3*f^a*f^(b/x^2)*x*log(f)^3)/105 + (4*b^2*f^a*f^(b/x^2)*x^3*log(f
)^2)/105 + (2*b*f^a*f^(b/x^2)*x^5*log(f))/35
```

3.144 $\int f^{a+\frac{b}{x^2}} x^4 \, dx$

Optimal. Leaf size=96

$$\frac{1}{5}f^{a+\frac{b}{x^2}}x^5+\frac{2}{15}bf^{a+\frac{b}{x^2}}x^3\log(f)+\frac{4}{15}b^2f^{a+\frac{b}{x^2}}x\log^2(f)-\frac{4}{15}b^{5/2}f^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)\log^{\frac{5}{2}}(f)$$

```
[Out] 1/5*f^(a+b/x^2)*x^5+2/15*b*f^(a+b/x^2)*x^3*ln(f)+4/15*b^2*f^(a+b/x^2)*x*ln(
f)^2-4/15*b^(5/2)*f^a*erfi(b^(1/2)*ln(f)^(1/2)/x)*ln(f)^(5/2)*Pi^(1/2)
```

Rubi [A]
time = 0.06, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {2245, 2237, 2242, 2235}

$$-\frac{4}{15}\sqrt{\pi}\,b^{5/2}f^a\log^{\frac{5}{2}}(f)\text{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)+\frac{4}{15}b^2x\log^2(f)f^{a+\frac{b}{x^2}}+\frac{1}{5}x^5f^{a+\frac{b}{x^2}}+\frac{2}{15}bx^3\log(f)f^{a+\frac{b}{x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)*x^4,x]
```

```
[Out] (f^(a + b/x^2)*x^5)/5 + (2*b*f^(a + b/x^2)*x^3*Log[f])/15 + (4*b^2*f^(a + b
/x^2)*x*Log[f]^2)/15 - (4*b^(5/2)*f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/
x]*Log[f]^(5/2))/15
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int f^{a+\frac{b}{x^2}}x^4\,dx &= \frac{1}{5}f^{a+\frac{b}{x^2}}x^5+\frac{1}{5}(2b\log(f))\int f^{a+\frac{b}{x^2}}x^2\,dx\\ &= \frac{1}{5}f^{a+\frac{b}{x^2}}x^5+\frac{2}{15}bf^{a+\frac{b}{x^2}}x^3\log(f)+\frac{1}{15}\left(4b^2\log^2(f)\right)\int f^{a+\frac{b}{x^2}}\,dx\\ &= \frac{1}{5}f^{a+\frac{b}{x^2}}x^5+\frac{2}{15}bf^{a+\frac{b}{x^2}}x^3\log(f)+\frac{4}{15}b^2f^{a+\frac{b}{x^2}}x\log^2(f)+\frac{1}{15}\left(8b^3\log^3(f)\right)\int \frac{f^{a+\frac{b}{x^2}}}{x^2}\,dx\\ &= \frac{1}{5}f^{a+\frac{b}{x^2}}x^5+\frac{2}{15}bf^{a+\frac{b}{x^2}}x^3\log(f)+\frac{4}{15}b^2f^{a+\frac{b}{x^2}}x\log^2(f)-\frac{1}{15}\left(8b^3\log^3(f)\right)\text{Subst}\left(\int f^{a+bx^2}\,d\right.\\ &= \frac{1}{5}f^{a+\frac{b}{x^2}}x^5+\frac{2}{15}bf^{a+\frac{b}{x^2}}x^3\log(f)+\frac{4}{15}b^2f^{a+\frac{b}{x^2}}x\log^2(f)-\frac{4}{15}b^{5/2}f^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)\end{aligned}$$

Mathematica [A]
time = 0.02, size = 74, normalized size = 0.77

$$\frac{1}{15}f^a\left(-4b^{5/2}\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)\log^{\frac{5}{2}}(f)+f^{\frac{b}{x^2}}x\left(3x^4+2bx^2\log(f)+4b^2\log^2(f)\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)*x^4,x]
```

```
[Out] (f^a*(-4*b^(5/2)*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x]*Log[f]^(5/2) + f^(
b/x^2)*x*(3*x^4 + 2*b*x^2*Log[f] + 4*b^2*Log[f]^2)))/15
```

Maple [A]
time = 0.03, size = 88, normalized size = 0.92

method	result	size

meijerg	$-\frac{f^a \ln(f)^{\frac{5}{2}} b^2 \sqrt{-b}\left(-\frac{2x^5\left(\frac{4b^2\ln(f)^2}{3x^4}+\frac{2b\ln(f)}{3x^2}+1\right)e^{\frac{b\ln(f)}{x^2}}}{5(-b)^{\frac{5}{2}}\ln(f)^{\frac{5}{2}}}+\frac{8b^{\frac{5}{2}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{\sqrt{b}\,\sqrt{\ln(f)}}{x}\right)}{15(-b)^{\frac{5}{2}}}\right)}{2}$	88
risch	$\frac{f^a x^5 f^{\frac{b}{x^2}}}{5}+\frac{2f^a\ln(f)b\,x^3 f^{\frac{b}{x^2}}}{15}+\frac{4f^a\ln(f)^2 b^2 x\,f^{\frac{b}{x^2}}}{15}-\frac{4f^a\ln(f)^3 b^3\sqrt{\pi}\,\operatorname{erf}\left(\frac{\sqrt{-b\ln(f)}}{x}\right)}{15\sqrt{-b\ln(f)}}$	89

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)*x^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*f^a*ln(f)^(5/2)*b^2*(-b)^(1/2)*(-2/5*x^5/(-b)^(5/2)/ln(f)^(5/2)*(4/3*b
^2*ln(f)^2/x^4+2/3*b*ln(f)/x^2+1)*exp(b*ln(f)/x^2)+8/15/(-b)^(5/2)*b^(5/2)*
Pi^(1/2)*erfi(b^(1/2)*ln(f)^(1/2)/x))
```

Maxima [A]
time = 0.32, size = 28, normalized size = 0.29

$$\frac{1}{2}\,f^a x^5 \left(-\frac{b\log(f)}{x^2}\right)^{\frac{5}{2}} \Gamma\left(-\frac{5}{2}, -\frac{b\log(f)}{x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^4,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*x^5*(-b*log(f)/x^2)^(5/2)*gamma(-5/2, -b*log(f)/x^2)
```

Fricas [A]
time = 0.36, size = 74, normalized size = 0.77

$$\frac{4}{15}\sqrt{\pi}\,\sqrt{-b\log(f)}\,b^2 f^a \operatorname{erf}\left(\frac{\sqrt{-b\log(f)}}{x}\right)\log(f)^2+\frac{1}{15}\left(3\,x^5+2\,bx^3\log(f)+4\,b^2x\log(f)^2\right)f^{\frac{ax^2+b}{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^4,x, algorithm="fricas")
```

```
[Out] 4/15*sqrt(pi)*sqrt(-b*log(f))*b^2*f^a*erf(sqrt(-b*log(f))/x)*log(f)^2 + 1/1
5*(3*x^5 + 2*b*x^3*log(f) + 4*b^2*x*log(f)^2)*f^((a*x^2 + b)/x^2)
```

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

$$\int f^{a+\frac{b}{x^2}} x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)*x**4,x)
```

```
[Out] Integral(f**(a + b/x**2)*x**4, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^4,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)*x^4, x)
```

Mupad [B]
time = 3.61, size = 107, normalized size = 1.11

$$\frac{f^a\,f^{\frac{b}{x^2}}\,x^5}{5}+\frac{4\,f^a\,x^5\,\sqrt{\pi}\,{\left(-\frac{b\,\ln\left(f\right)}{x^2}\right)}^{5/2}}{15}-\frac{4\,f^a\,x^5\,\sqrt{\pi}\,\mathrm{erfc}\left(\sqrt{-\frac{b\,\ln\left(f\right)}{x^2}}\right)\,{\left(-\frac{b\,\ln\left(f\right)}{x^2}\right)}^{5/2}}{15}+\frac{4\,b^2\,f^a\,f^{\frac{b}{x^2}}\,x\,{\ln\left(f\right)}^2}{15}+\frac{2\,b\,f^a\,f^{\frac{b}{x^2}}\,x^3\,\ln\left(f\right)}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)*x^4,x)
```

```
[Out] (f^a*f^(b/x^2)*x^5)/5 + (4*f^a*x^5*pi^(1/2)*(-(b*log(f))/x^2)^(5/2))/15 - (
4*f^a*x^5*pi^(1/2)*erfc((-(b*log(f))/x^2)^(1/2))*(-(b*log(f))/x^2)^(5/2))/1
5 + (4*b^2*f^a*f^(b/x^2)*x*log(f)^2)/15 + (2*b*f^a*f^(b/x^2)*x^3*log(f))/15
```

3.145 $\int f^{a+\frac{b}{x^2}} x^2 \, dx$

Optimal. Leaf size=73

$$\frac{1}{3}f^{a+\frac{b}{x^2}}x^3+\frac{2}{3}bf^{a+\frac{b}{x^2}}x\log(f)-\frac{2}{3}b^{3/2}f^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)\log^{\frac{3}{2}}(f)$$

[Out] 1/3*f^(a+b/x^2)*x^3+2/3*b*f^(a+b/x^2)*x*ln(f)-2/3*b^(3/2)*f^a*erfi(b^(1/2)*ln(f)^(1/2)/x)*ln(f)^(3/2)*Pi^(1/2)

Rubi [A]
time = 0.05, antiderivative size = 73, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {2245, 2237, 2242, 2235}

$$-\frac{2}{3}\sqrt{\pi}\,b^{3/2}f^a\log^{\frac{3}{2}}(f)\text{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)+\frac{2}{3}bx\log(f)f^{a+\frac{b}{x^2}}+\frac{1}{3}x^3f^{a+\frac{b}{x^2}}$$

Antiderivative was successfully verified.

[In] Int[f^(a + b/x^2)*x^2,x]

[Out] (f^(a + b/x^2)*x^3)/3 + (2*b*f^(a + b/x^2)*x*Log[f])/3 - (2*b^(3/2)*f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x]*Log[f]^(3/2))/3

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{F, a, b, c, d}, x] && PosQ[b]
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c + d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a + b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && ILtQ[n, 0]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int f^{a+\frac{b}{x^2}}x^2\,dx&=\frac{1}{3}f^{a+\frac{b}{x^2}}x^3+\frac{1}{3}(2b\log(f))\int f^{a+\frac{b}{x^2}}\,dx\\&=\frac{1}{3}f^{a+\frac{b}{x^2}}x^3+\frac{2}{3}bf^{a+\frac{b}{x^2}}x\log(f)+\frac{1}{3}\left(4b^2\log^2(f)\right)\int\frac{f^{a+\frac{b}{x^2}}}{x^2}\,dx\\&=\frac{1}{3}f^{a+\frac{b}{x^2}}x^3+\frac{2}{3}bf^{a+\frac{b}{x^2}}x\log(f)-\frac{1}{3}\left(4b^2\log^2(f)\right)\text{Subst}\left(\int f^{a+bx^2}\,dx,x,\frac{1}{x}\right)\\&=\frac{1}{3}f^{a+\frac{b}{x^2}}x^3+\frac{2}{3}bf^{a+\frac{b}{x^2}}x\log(f)-\frac{2}{3}b^{3/2}f^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)\log^{\frac{3}{2}}(f)\end{aligned}$$

Mathematica [A]
time = 0.02, size = 60, normalized size = 0.82

$$\frac{1}{3}f^a\left(-2b^{3/2}\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)\log^{\frac{3}{2}}(f)+f^{\frac{b}{x^2}}x\left(x^2+2b\log(f)\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)*x^2,x]
[Out] (f^a*(-2*b^(3/2)*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x]*Log[f]^(3/2) + f^(
b/x^2)*x*(x^2 + 2*b*Log[f])))/3
```

Maple [A]
time = 0.03, size = 67, normalized size = 0.92

method	result	size
risch	$\frac{f^a x^3 f^{\frac{b}{x^2}}}{3}+\frac{2f^a\ln(f)bx\,f^{\frac{b}{x^2}}}{3}-\frac{2f^a\ln(f)^2b^2\sqrt{\pi}\,\text{erf}\left(\frac{\sqrt{-b\ln(f)}}{x}\right)}{3\sqrt{-b\ln(f)}}$	67

meijerg	$\frac{f^a b \ln(f)^{\frac{3}{2}} \sqrt{-b} \left(-\frac{2x^3 \left(\frac{2b\ln(f)}{x^2}+1\right) e^{\frac{b\ln(f)}{x^2}}}{3(-b)^{\frac{3}{2}} \ln(f)^{\frac{3}{2}}} + \frac{4b^{\frac{3}{2}} \sqrt{\pi}\, \operatorname{erfi}\left(\frac{\sqrt{b}\, \sqrt{\ln(f)}}{x}\right)}{3(-b)^{\frac{3}{2}}}\right)}{2}$	74

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)*x^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*f^a*x^3*f^(b/x^2)+2/3*f^a*ln(f)*b*x*f^(b/x^2)-2/3*f^a*ln(f)^2*b^2*Pi^(1
/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(1/2)/x)
```

Maxima [A]
time = 0.32, size = 28, normalized size = 0.38

$$\frac{1}{2} f^a x^3 \left(-\frac{b\log(f)}{x^2}\right)^{\frac{3}{2}} \Gamma\left(-\frac{3}{2}, -\frac{b\log(f)}{x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*f^a*x^3*(-b*log(f)/x^2)^(3/2)*gamma(-3/2, -b*log(f)/x^2)
```

Fricas [A]
time = 0.38, size = 56, normalized size = 0.77

$$\frac{2}{3} \sqrt{\pi} \sqrt{-b\log(f)}\, bf^a \operatorname{erf}\left(\frac{\sqrt{-b\log(f)}}{x}\right) \log(f) + \frac{1}{3} \left(x^3 + 2\,bx\log(f)\right) f^{\frac{ax^2+b}{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/3*sqrt(pi)*sqrt(-b*log(f))*b*f^a*erf(sqrt(-b*log(f))/x)*log(f) + 1/3*(x^3
 + 2*b*x*log(f))*f^((a*x^2 + b)/x^2)
```

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

$$\int f^{a+\frac{b}{x^2}} x^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)*x**2,x)
```

```
[Out] Integral(f**(a + b/x**2)*x**2, x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^(a + b/x^2)*x^2, x)
```

Mupad [**B**]
time = 3.61, size = 71, normalized size = 0.97

$$x^3\left(\frac{f^a\,f^{\frac{b}{x^2}}}{3}+\frac{2\,b\,f^a\,f^{\frac{b}{x^2}}\,\ln\left(f\right)}{3\,x^2}\right)-\frac{2\,b^2\,f^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,\ln(f)}{x\,\sqrt{b\,\ln\left(f\right)}}\right)\,{\ln\left(f\right)}^2}{3\,\sqrt{b\,\ln\left(f\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)*x^2,x)
```

```
[Out] x^3*((f^a*f^(b/x^2))/3 + (2*b*f^a*f^(b/x^2)*log(f))/(3*x^2)) - (2*b^2*f^a*p
i^(1/2)*erfi((b*log(f))/(x*(b*log(f))^(1/2)))*log(f)^2)/(3*(b*log(f))^(1/2)
)
```

3.146 $\int f^{a+\frac{b}{x^2}}\,dx$

Optimal. Leaf size=49

$$f^{a+\frac{b}{x^2}}x-\sqrt{b}\,f^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)\sqrt{\log(f)}$$

```
[Out] f^(a+b/x^2)*x-f^a*erfi(b^(1/2)*ln(f)^(1/2)/x)*b^(1/2)*Pi^(1/2)*ln(f)^(1/2)
```

Rubi [A]
time = 0.03, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {2237, 2242, 2235}

$$xf^{a+\frac{b}{x^2}}-\sqrt{\pi}\,\sqrt{b}\,f^a\sqrt{\log(f)}\,\mathrm{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2),x]
```

```
[Out] f^(a + b/x^2)*x - Sqrt[b]*f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x]*Sqrt[
Log[f]]
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rubi steps

$$
\begin{aligned}
\int f^{a+\frac{b}{x^2}}\,dx &= f^{a+\frac{b}{x^2}}x+(2b\log(f))\int\frac{f^{a+\frac{b}{x^2}}}{x^2}\,dx\\
&= f^{a+\frac{b}{x^2}}x-(2b\log(f))\text{Subst}\left(\int f^{a+bx^2}\,dx,x,\frac{1}{x}\right)\\
&= f^{a+\frac{b}{x^2}}x-\sqrt{b}\,f^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)\sqrt{\log(f)}
\end{aligned}
$$

Mathematica [**A**]
time = 0.01, size = 49, normalized size = 1.00

$$
f^{a+\frac{b}{x^2}}x-\sqrt{b}\,f^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)\sqrt{\log(f)}
$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2),x]
```

```
[Out] f^(a + b/x^2)*x - Sqrt[b]*f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x]*Sqrt[
Log[f]]
```

Maple [**A**]
time = 0.02, size = 44, normalized size = 0.90

method	result	size
risch	$f^a x\, f^{\frac{b}{x^2}}-\frac{f^a\ln(f)b\sqrt{\pi}\ \text{erf}\left(\frac{\sqrt{-b\ln(f)}}{x}\right)}{\sqrt{-b\ln(f)}}$	44
meijerg	$-\frac{f^a\sqrt{-b}\ \sqrt{\ln(f)}\left(-\frac{2x\,\mathrm{e}^{\frac{b\ln(f)}{x^2}}}{\sqrt{-b}\ \sqrt{\ln(f)}}+\frac{2\sqrt{b}\ \sqrt{\pi}\ \text{erfi}\left(\frac{\sqrt{b}\ \sqrt{\ln(f)}}{x}\right)}{\sqrt{-b}}\right)}{2}$	61

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2),x,method=_RETURNVERBOSE)
```

```
[Out] f^a*x*f^(b/x^2)-f^a*ln(f)*b*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(1/2)/
x)
```

Maxima [**A**]
time = 0.32, size = 26, normalized size = 0.53

$$
\frac{1}{2}\,f^a x\sqrt{-\frac{b\log{(f)}}{x^2}}\,\Gamma\left(-\frac{1}{2},-\frac{b\log{(f)}}{x^2}\right)
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2),x, algorithm="maxima")
[Out] 1/2*f^a*x*sqrt(-b*log(f)/x^2)*gamma(-1/2, -b*log(f)/x^2)
```

Fricas [A]
time = 0.39, size = 42, normalized size = 0.86

$$\sqrt{\pi}\,\sqrt{-b\log\left(f\right)}\,f^{a}\operatorname{erf}\left(\frac{\sqrt{-b\log\left(f\right)}}{x}\right)+f^{\frac{ax^{2}+b}{x^{2}}}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2),x, algorithm="fricas")
[Out] sqrt(pi)*sqrt(-b*log(f))*f^a*erf(sqrt(-b*log(f))/x) + f^((a*x^2 + b)/x^2)*x
```

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

$$\int f^{a+\frac{b}{x^{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2),x)
[Out] Integral(f**(a + b/x**2), x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2),x, algorithm="giac")
[Out] integrate(f^(a + b/x^2), x)
```

Mupad [B]
time = 3.60, size = 44, normalized size = 0.90

$$f^{a}\,f^{\frac{b}{x^{2}}}\,x-\frac{b\,f^{a}\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b\,\ln(f)}{x\,\sqrt{b\,\ln\left(f\right)}}\right)\,\ln\left(f\right)}{\sqrt{b\,\ln\left(f\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2),x)
[Out] f^a*f^(b/x^2)*x - (b*f^a*pi^(1/2)*erfi((b*log(f))/(x*(b*log(f))^(1/2)))*log
(f))/(b*log(f))^(1/2)
```

3.147 $\int \frac{f^{a+\frac{b}{x^2}}}{x^2}\,dx$

Optimal. Leaf size=39

$$-\frac{f^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)}{2\sqrt{b}\,\sqrt{\log(f)}}$$

```
[Out] -1/2*f^a*erfi(b^(1/2)*ln(f)^(1/2)/x)*Pi^(1/2)/b^(1/2)/ln(f)^(1/2)
```

Rubi [A]
time = 0.02, antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2242, 2235}

$$-\frac{\sqrt{\pi}\,f^a\mathrm{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)}{2\sqrt{b}\,\sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^2,x]
```

```
[Out] -1/2*(f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x])/(Sqrt[b]*Sqrt[Log[f]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rubi steps

$$\begin{aligned}\int \frac{f^{a+\frac{b}{x^2}}}{x^2}\,dx &= -\mathrm{Subst}\left(\int f^{a+bx^2}\,dx, x, \frac{1}{x}\right)\\ &= -\frac{f^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)}{2\sqrt{b}\,\sqrt{\log(f)}}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 39, normalized size = 1.00

$$-\frac{f^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)}{2\sqrt{b}\sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x^2,x]
[Out] -1/2*(f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x])/(Sqrt[b]*Sqrt[Log[f]])
```

Maple [A]
time = 0.02, size = 28, normalized size = 0.72

method	result	size
meijerg	$-\frac{f^a\,\mathrm{erfi}\left(\frac{\sqrt{b}\sqrt{\ln(f)}}{x}\right)\sqrt{\pi}}{2\sqrt{b}\sqrt{\ln(f)}}$	28
risch	$-\frac{f^a\sqrt{\pi}\,\mathrm{erf}\left(\frac{\sqrt{-b\ln(f)}}{x}\right)}{2\sqrt{-b\ln(f)}}$	28

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^2,x,method=_RETURNVERBOSE)
[Out] -1/2*f^a*erfi(b^(1/2)*ln(f)^(1/2)/x)*Pi^(1/2)/b^(1/2)/ln(f)^(1/2)
```

Maxima [A]
time = 0.31, size = 34, normalized size = 0.87

$$-\frac{\sqrt{\pi}\,f^a\left(\mathrm{erf}\left(\sqrt{-\frac{b\log(f)}{x^2}}\right)-1\right)}{2\,x\sqrt{-\frac{b\log(f)}{x^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^2,x, algorithm="maxima")
[Out] -1/2*sqrt(pi)*f^a*(erf(sqrt(-b*log(f)/x^2)) - 1)/(x*sqrt(-b*log(f)/x^2))
```

Fricas [A]
time = 0.38, size = 34, normalized size = 0.87

$$\frac{\sqrt{\pi}\sqrt{-b\log(f)}\,f^a\,\mathrm{erf}\left(\frac{\sqrt{-b\log(f)}}{x}\right)}{2\,b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^2,x, algorithm="fricas")
```

```
[Out] 1/2*sqrt(pi)*sqrt(-b*log(f))*f^a*erf(sqrt(-b*log(f))/x)/(b*log(f))
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**2,x)
```

```
[Out] Integral(f**(a + b/x**2)/x**2, x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^2,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)/x^2, x)
```

Mupad [**B**]
time = 3.52, size = 28, normalized size = 0.72

$$-\frac{f^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,\ln(f)}{x\,\sqrt{b\,\ln\left(f\right)}}\right)}{2\,\sqrt{b\,\ln\left(f\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^2,x)
```

```
[Out] -(f^a*pi^(1/2)*erfi((b*log(f))/(x*(b*log(f))^(1/2))))/(2*(b*log(f))^(1/2))
```

3.148 $\int \frac{f^{a+\frac{b}{x^2}}}{x^4} dx$

Optimal. Leaf size=63

$$\frac{f^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)}{4b^{3/2}\log^{\frac{3}{2}}(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx\log(f)}$$

```
[Out] -1/2*f^(a+b/x^2)/b/x/ln(f)+1/4*f^a*erfi(b^(1/2)*ln(f)^(1/2)/x)*Pi^(1/2)/b^(
3/2)/ln(f)^(3/2)
```

Rubi [A]
time = 0.04, antiderivative size = 63, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$, Rules used = {2243, 2242, 2235}

$$\frac{\sqrt{\pi}\,f^a\text{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)}{4b^{3/2}\log^{\frac{3}{2}}(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^4,x]
```

```
[Out] (f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x])/(4*b^(3/2)*Log[f]^(3/2)) - f^
(a + b/x^2)/(2*b*x*Log[f])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
```

```
0])
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^4}\,dx = -\frac{f^{a+\frac{b}{x^2}}}{2bx\log(f)} - \frac{\int \frac{f^{a+\frac{b}{x^2}}}{x^2}\,dx}{2b\log(f)}$$
$$= -\frac{f^{a+\frac{b}{x^2}}}{2bx\log(f)} + \frac{\text{Subst}\left(\int f^{a+bx^2}\,dx, x, \frac{1}{x}\right)}{2b\log(f)}$$
$$= \frac{f^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)}{4b^{3/2}\log^{\frac{3}{2}}(f)} - \frac{f^{a+\frac{b}{x^2}}}{2bx\log(f)}$$

Mathematica [A]
time = 0.02, size = 63, normalized size = 1.00

$$\frac{f^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)}{4b^{3/2}\log^{\frac{3}{2}}(f)} - \frac{f^{a+\frac{b}{x^2}}}{2bx\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x^4,x]
[Out] (f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x])/(4*b^(3/2)*Log[f]^(3/2)) - f^
(a + b/x^2)/(2*b*x*Log[f])
```

Maple [A]
time = 0.04, size = 58, normalized size = 0.92

method	result	size
risch	$-\frac{f^a f^{\frac{b}{x^2}}}{2xb\ln(f)} + \frac{f^a\sqrt{\pi}\ \text{erf}\left(\frac{\sqrt{-b\ln(f)}}{x}\right)}{4\ln(f)b\sqrt{-b\ln(f)}}$	58
meijerg	$-\frac{f^a\sqrt{-b}\left(\frac{(-b)^{\frac{3}{2}}\sqrt{\ln(f)}\,\mathrm{e}^{\frac{b\ln(f)}{x^2}}}{xb} - \frac{(-b)^{\frac{3}{2}}\sqrt{\pi}\ \text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\ln(f)}}{x}\right)}{2b^{\frac{3}{2}}}\right)}{2\ln(f)^{\frac{3}{2}}b^2}$	68

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*f^a*f^(b/x^2)/x/b/ln(f)+1/4*f^a/ln(f)/b*Pi^(1/2)/(-b*ln(f))^(1/2)*erf(
(-b*ln(f))^(1/2)/x)
```

Maxima [**A**]
time = 0.32, size = 28, normalized size = 0.44

$$\frac{f^a\Gamma\left(\frac{3}{2}, -\frac{b\log(f)}{x^2}\right)}{2\,x^3\left(-\frac{b\log(f)}{x^2}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^4,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*gamma(3/2, -b*log(f)/x^2)/(x^3*(-b*log(f)/x^2)^(3/2))
```

Fricas [**A**]
time = 0.40, size = 58, normalized size = 0.92

$$-\frac{\sqrt{\pi}\,\sqrt{-b\log(f)}\,f^a x\operatorname{erf}\left(\frac{\sqrt{-b\log(f)}}{x}\right) + 2\,bf^{\frac{ax^2+b}{x^2}}\log(f)}{4\,b^2x\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^4,x, algorithm="fricas")
```

```
[Out] -1/4*(sqrt(pi)*sqrt(-b*log(f))*f^a*x*erf(sqrt(-b*log(f))/x) + 2*b*f^((a*x^2
 + b)/x^2)*log(f))/(b^2*x*log(f)^2)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**4,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^4,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)/x^4, x)
```

Mupad [B]
time = 3.56, size = 58, normalized size = 0.92

$$\frac{f^a\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b\,\ln(f)}{x\,\sqrt{b\,\ln\left(f\right)}}\right)}{4\,b\,\ln\left(f\right)\,\sqrt{b\,\ln\left(f\right)}}-\frac{f^a\,f^{\frac{b}{x^2}}}{2\,b\,x\,\ln\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^4,x)
```

```
[Out] (f^a*pi^(1/2)*erfi((b*log(f))/(x*(b*log(f))^(1/2))))/(4*b*log(f)*(b*log(f))
^(1/2)) - (f^a*f^(b/x^2))/(2*b*x*log(f))
```

3.149 $\int \frac{f^{a+\frac{b}{x^2}}}{x^6} \, dx$

Optimal. Leaf size=86

$$-\frac{3f^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)}{8b^{5/2}\log^{\frac{5}{2}}(f)}+\frac{3f^{a+\frac{b}{x^2}}}{4b^2x\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^3\log(f)}$$

```
[Out] 3/4*f^(a+b/x^2)/b^2/x/ln(f)^2-1/2*f^(a+b/x^2)/b/x^3/ln(f)-3/8*f^a*erfi(b^(1
/2)*ln(f)^(1/2)/x)*Pi^(1/2)/b^(5/2)/ln(f)^(5/2)
```

Rubi [A]
time = 0.06, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$, Rules used = {2243, 2242, 2235}

$$-\frac{3\sqrt{\pi}\,f^a\mathrm{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)}{8b^{5/2}\log^{\frac{5}{2}}(f)}+\frac{3f^{a+\frac{b}{x^2}}}{4b^2x\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^3\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^6,x]
```

```
[Out] (-3*f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x])/(8*b^(5/2)*Log[f]^(5/2)) +
 (3*f^(a + b/x^2))/(4*b^2*x*Log[f]^2) - f^(a + b/x^2)/(2*b*x^3*Log[f])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
```

```
0])
```

Rubi steps

$$\begin{aligned}
\int \frac{f^{a+\frac{b}{x^2}}}{x^6}\,dx &= -\frac{f^{a+\frac{b}{x^2}}}{2bx^3\log(f)} - \frac{3\int \frac{f^{a+\frac{b}{x^2}}}{x^4}\,dx}{2b\log(f)} \\
&= \frac{3f^{a+\frac{b}{x^2}}}{4b^2x\log^2(f)} - \frac{f^{a+\frac{b}{x^2}}}{2bx^3\log(f)} + \frac{3\int \frac{f^{a+\frac{b}{x^2}}}{x^2}\,dx}{4b^2\log^2(f)} \\
&= \frac{3f^{a+\frac{b}{x^2}}}{4b^2x\log^2(f)} - \frac{f^{a+\frac{b}{x^2}}}{2bx^3\log(f)} - \frac{3\text{Subst}\left(\int f^{a+bx^2}\,dx, x, \frac{1}{x}\right)}{4b^2\log^2(f)} \\
&= -\frac{3f^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)}{8b^{5/2}\log^{\frac{5}{2}}(f)} + \frac{3f^{a+\frac{b}{x^2}}}{4b^2x\log^2(f)} - \frac{f^{a+\frac{b}{x^2}}}{2bx^3\log(f)}
\end{aligned}$$

Mathematica [A]
time = 0.04, size = 74, normalized size = 0.86

$$-\frac{3f^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)}{8b^{5/2}\log^{\frac{5}{2}}(f)} + \frac{f^{a+\frac{b}{x^2}}(3x^2-2b\log(f))}{4b^2x^3\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x^6,x]
```

```
[Out] (-3*f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x])/(8*b^(5/2)*Log[f]^(5/2)) +
 (f^(a + b/x^2)*(3*x^2 - 2*b*Log[f]))/(4*b^2*x^3*Log[f]^2)
```

Maple [A]
time = 0.03, size = 79, normalized size = 0.92

method	result	size
meijerg	$\frac{f^a\sqrt{-b}\left(-\frac{(-b)^{\frac{5}{2}}\sqrt{\ln(f)}\left(-\frac{10b\ln(f)}{x^2}+15\right)e^{\frac{b\ln(f)}{x^2}}}{10x\,b^2}+\frac{3(-b)^{\frac{5}{2}}\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\ln(f)}}{x}\right)}{4b^{\frac{5}{2}}}\right)}{2\ln(f)^{\frac{5}{2}}b^3}$	79

risch	$-\frac{f^{a} f^{\frac{b}{x^{2}}}}{2 x^{3} b \ln (f)}+\frac{3 f^{a} f^{\frac{b}{x^{2}}}}{4 \ln (f)^{2} b^{2} x}-\frac{3 f^{a} \sqrt{\pi}\, \operatorname{erf}\left(\frac{\sqrt{-b \ln (f)}}{x}\right)}{8 \ln (f)^{2} b^{2} \sqrt{-b \ln (f)}}$	80

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^6,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*f^a/ln(f)^(5/2)/b^3*(-b)^(1/2)*(-1/10/x*(-b)^(5/2)*ln(f)^(1/2)*(-10*b*l
n(f)/x^2+15)/b^2*exp(b*ln(f)/x^2)+3/4*(-b)^(5/2)/b^(5/2)*Pi^(1/2)*erfi(b^(1
/2)*ln(f)^(1/2)/x))
```

Maxima [A]
time = 0.33, size = 28, normalized size = 0.33

$$\frac{f^{a} \Gamma\left(\frac{5}{2},-\frac{b \log (f)}{x^{2}}\right)}{2\, x^{5}\left(-\frac{b \log (f)}{x^{2}}\right)^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^6,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*gamma(5/2, -b*log(f)/x^2)/(x^5*(-b*log(f)/x^2)^(5/2))
```

Fricas [A]
time = 0.39, size = 76, normalized size = 0.88

$$\frac{3 \sqrt{\pi} \sqrt{-b \log (f)}\, f^{a} x^{3} \operatorname{erf}\left(\frac{\sqrt{-b \log (f)}}{x}\right)+2\left(3\, b x^{2} \log (f)-2\, b^{2} \log (f)^{2}\right) f^{\frac{a x^{2}+b}{x^{2}}}}{8\, b^{3} x^{3} \log (f)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^6,x, algorithm="fricas")
```

```
[Out] 1/8*(3*sqrt(pi)*sqrt(-b*log(f))*f^a*x^3*erf(sqrt(-b*log(f))/x) + 2*(3*b*x^2
*log(f) - 2*b^2*log(f)^2)*f^((a*x^2 + b)/x^2))/(b^3*x^3*log(f)^3)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**6,x)
```

```
[Out] Timed out
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^6,x, algorithm="giac")
[Out] integrate(f^(a + b/x^2)/x^6, x)
```

Mupad [B]
time = 3.59, size = 79, normalized size = 0.92

$$-\frac{f^a\left(3\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\ln(f)}{x\sqrt{b\ln(f)}}\right)-\frac{6\,f^{\frac{b}{x^2}}\sqrt{b\ln(f)}}{x}\right)}{8\,b^2\ln(f)^2\sqrt{b\ln(f)}}-\frac{f^a\,f^{\frac{b}{x^2}}}{2\,b\,x^3\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^6,x)
[Out] - (f^a*(3*pi^(1/2)*erfi((b*log(f))/(x*(b*log(f))^(1/2))) - (6*f^(b/x^2)*(b*
log(f))^(1/2))/x))/(8*b^2*log(f)^2*(b*log(f))^(1/2)) - (f^a*f^(b/x^2))/(2*b
*x^3*log(f))
```

3.150 $\int \frac{f^{a+\frac{b}{x^2}}}{x^8}\,dx$

Optimal. Leaf size=109

$$\frac{15f^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)}{16b^{7/2}\log^{\frac{7}{2}}(f)}-\frac{15f^{a+\frac{b}{x^2}}}{8b^3x\log^3(f)}+\frac{5f^{a+\frac{b}{x^2}}}{4b^2x^3\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^5\log(f)}$$

```
[Out] -15/8*f^(a+b/x^2)/b^3/x/ln(f)^3+5/4*f^(a+b/x^2)/b^2/x^3/ln(f)^2-1/2*f^(a+b/
x^2)/b/x^5/ln(f)+15/16*f^a*erfi(b^(1/2)*ln(f)^(1/2)/x)*Pi^(1/2)/b^(7/2)/ln(
f)^(7/2)
```

Rubi [A]
time = 0.08, antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$, Rules used = {2243, 2242, 2235}

$$\frac{15\sqrt{\pi}\,f^a\mathrm{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)}{16b^{7/2}\log^{\frac{7}{2}}(f)}-\frac{15f^{a+\frac{b}{x^2}}}{8b^3x\log^3(f)}+\frac{5f^{a+\frac{b}{x^2}}}{4b^2x^3\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^5\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^8,x]
```

```
[Out] (15*f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x])/(16*b^(7/2)*Log[f]^(7/2))
- (15*f^(a + b/x^2))/(8*b^3*x*Log[f]^3) + (5*f^(a + b/x^2))/(4*b^2*x^3*Log[
f]^2) - f^(a + b/x^2)/(2*b*x^5*Log[f])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
```

```
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$
\begin{aligned}
\int \frac{f^{a+\frac{b}{x^2}}}{x^8}\,dx &= -\frac{f^{a+\frac{b}{x^2}}}{2bx^5\log(f)}-\frac{5\int \frac{f^{a+\frac{b}{x^2}}}{x^6}\,dx}{2b\log(f)}\\
&= \frac{5f^{a+\frac{b}{x^2}}}{4b^2x^3\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^5\log(f)}+\frac{15\int \frac{f^{a+\frac{b}{x^2}}}{x^4}\,dx}{4b^2\log^2(f)}\\
&= -\frac{15f^{a+\frac{b}{x^2}}}{8b^3x\log^3(f)}+\frac{5f^{a+\frac{b}{x^2}}}{4b^2x^3\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^5\log(f)}-\frac{15\int \frac{f^{a+\frac{b}{x^2}}}{x^2}\,dx}{8b^3\log^3(f)}\\
&= -\frac{15f^{a+\frac{b}{x^2}}}{8b^3x\log^3(f)}+\frac{5f^{a+\frac{b}{x^2}}}{4b^2x^3\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^5\log(f)}+\frac{15\text{Subst}\left(\int f^{a+bx^2}\,dx,x,\frac{1}{x}\right)}{8b^3\log^3(f)}\\
&= \frac{15f^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)}{16b^{7/2}\log^{\frac{7}{2}}(f)}-\frac{15f^{a+\frac{b}{x^2}}}{8b^3x\log^3(f)}+\frac{5f^{a+\frac{b}{x^2}}}{4b^2x^3\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^5\log(f)}
\end{aligned}
$$

Mathematica [A]
time = 0.04, size = 86, normalized size = 0.79

$$\frac{15f^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)}{16b^{7/2}\log^{\frac{7}{2}}(f)}-\frac{f^{a+\frac{b}{x^2}}\left(15x^4-10bx^2\log(f)+4b^2\log^2(f)\right)}{8b^3x^5\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x^8,x]
```

```
[Out] (15*f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x])/(16*b^(7/2)*Log[f]^(7/2))
- (f^(a + b/x^2)*(15*x^4 - 10*b*x^2*Log[f] + 4*b^2*Log[f]^2))/(8*b^3*x^5*Lo
g[f]^3)
```

Maple [A]
time = 0.05, size = 91, normalized size = 0.83

method	result	size

meijerg	$-\frac{f^{a}\sqrt{-b}\left(\frac{(-b)^{\frac{7}{2}}\sqrt{\ln(f)}\left(\frac{28b^{2}\ln(f)^{2}}{x^{4}}-\frac{70b\ln(f)}{x^{2}}+105\right)e^{\frac{b\ln(f)}{x^{2}}}}{28x\,b^{3}}-\frac{15(-b)^{\frac{7}{2}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{\sqrt{b}\,\sqrt{\ln(f)}}{x}\right)}{8b^{\frac{7}{2}}}\right)}{2\ln(f)^{\frac{7}{2}}b^{4}}$	91
risch	$-\frac{f^{a}f^{\frac{b}{x^{2}}}}{2x^{5}b\ln(f)}+\frac{5f^{a}f^{\frac{b}{x^{2}}}}{4\ln(f)^{2}b^{2}x^{3}}-\frac{15f^{a}f^{\frac{b}{x^{2}}}}{8\ln(f)^{3}b^{3}x}+\frac{15f^{a}\sqrt{\pi}\,\operatorname{erf}\left(\frac{\sqrt{-b\ln(f)}}{x}\right)}{16\ln(f)^{3}b^{3}\sqrt{-b\ln(f)}}$	102

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^8,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*f^a/ln(f)^(7/2)/b^4*(-b)^(1/2)*(1/28/x*(-b)^(7/2)*ln(f)^(1/2)*(28*b^2*
ln(f)^2/x^4-70*b*ln(f)/x^2+105)/b^3*exp(b*ln(f)/x^2)-15/8*(-b)^(7/2)/b^(7/2
)*Pi^(1/2)*erfi(b^(1/2)*ln(f)^(1/2)/x))
```

Maxima [A]
time = 0.32, size = 28, normalized size = 0.26

$$\frac{f^{a}\Gamma\left(\frac{7}{2},-\frac{b\log(f)}{x^{2}}\right)}{2\,x^{7}\left(-\frac{b\log(f)}{x^{2}}\right)^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^8,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*gamma(7/2, -b*log(f)/x^2)/(x^7*(-b*log(f)/x^2)^(7/2))
```

Fricas [A]
time = 0.39, size = 88, normalized size = 0.81

$$-\frac{15\sqrt{\pi}\sqrt{-b\log(f)}\,f^{a}x^{5}\operatorname{erf}\left(\frac{\sqrt{-b\log(f)}}{x}\right)+2\left(15\,bx^{4}\log(f)-10\,b^{2}x^{2}\log(f)^{2}+4\,b^{3}\log(f)^{3}\right)f^{\frac{ax^{2}+b}{x^{2}}}}{16\,b^{4}x^{5}\log(f)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^8,x, algorithm="fricas")
```

```
[Out] -1/16*(15*sqrt(pi)*sqrt(-b*log(f))*f^a*x^5*erf(sqrt(-b*log(f))/x) + 2*(15*b
*x^4*log(f) - 10*b^2*x^2*log(f)^2 + 4*b^3*log(f)^3)*f^((a*x^2 + b)/x^2))/(b
^4*x^5*log(f)^4)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**8,x)
```

```
[Out] Timed out
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^8,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)/x^8, x)
```

Mupad [B]
time = 3.66, size = 102, normalized size = 0.94

$$\frac{5\,f^a\,f^{\frac{b}{x^2}}}{4\,b^2\,x^3\,\ln\left(f\right)^2}-\frac{f^a\,f^{\frac{b}{x^2}}}{2\,b\,x^5\,\ln\left(f\right)}-\frac{15\,f^a\,f^{\frac{b}{x^2}}}{8\,b^3\,x\,\ln\left(f\right)^3}+\frac{15\,f^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,\ln(f)}{x\,\sqrt{b\,\ln\left(f\right)}}\right)}{16\,b^3\,\ln\left(f\right)^3\,\sqrt{b\,\ln\left(f\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^8,x)
```

```
[Out] (5*f^a*f^(b/x^2))/(4*b^2*x^3*log(f)^2) - (f^a*f^(b/x^2))/(2*b*x^5*log(f)) -
 (15*f^a*f^(b/x^2))/(8*b^3*x*log(f)^3) + (15*f^a*pi^(1/2)*erfi((b*log(f))/(
x*(b*log(f))^(1/2))))/(16*b^3*log(f)^3*(b*log(f))^(1/2))
```

3.151 $\int \frac{f^{a+\frac{b}{x^2}}}{x^{10}}\,dx$

Optimal. Leaf size=132

$$-\frac{105 f^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)}{32 b^{9/2}\log^{\frac{9}{2}}(f)}+\frac{105 f^{a+\frac{b}{x^2}}}{16 b^4 x\log^4(f)}-\frac{35 f^{a+\frac{b}{x^2}}}{8 b^3 x^3\log^3(f)}+\frac{7 f^{a+\frac{b}{x^2}}}{4 b^2 x^5\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2 b x^7\log(f)}$$

```
[Out] 105/16*f^(a+b/x^2)/b^4/x/ln(f)^4-35/8*f^(a+b/x^2)/b^3/x^3/ln(f)^3+7/4*f^(a+
b/x^2)/b^2/x^5/ln(f)^2-1/2*f^(a+b/x^2)/b/x^7/ln(f)-105/32*f^a*erfi(b^(1/2)*
ln(f)^(1/2)/x)*Pi^(1/2)/b^(9/2)/ln(f)^(9/2)
```

Rubi [A]
time = 0.10, antiderivative size = 132, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$, Rules used = {2243, 2242, 2235}

$$-\frac{105\sqrt{\pi}\,f^a\mathrm{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)}{32 b^{9/2}\log^{\frac{9}{2}}(f)}+\frac{105 f^{a+\frac{b}{x^2}}}{16 b^4 x\log^4(f)}-\frac{35 f^{a+\frac{b}{x^2}}}{8 b^3 x^3\log^3(f)}+\frac{7 f^{a+\frac{b}{x^2}}}{4 b^2 x^5\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2 b x^7\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^10,x]
```

```
[Out] (-105*f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x])/(32*b^(9/2)*Log[f]^(9/2)
) + (105*f^(a + b/x^2))/(16*b^4*x*Log[f]^4) - (35*f^(a + b/x^2))/(8*b^3*x^3
*Log[f]^3) + (7*f^(a + b/x^2))/(4*b^2*x^5*Log[f]^2) - f^(a + b/x^2)/(2*b*x^
7*Log[f])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
```

```
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{f^{a+\frac{b}{x^2}}}{x^{10}}\,dx &= -\frac{f^{a+\frac{b}{x^2}}}{2bx^7\log(f)}-\frac{7\int \frac{f^{a+\frac{b}{x^2}}}{x^8}\,dx}{2b\log(f)}\\
&= \frac{7f^{a+\frac{b}{x^2}}}{4b^2x^5\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^7\log(f)}+\frac{35\int \frac{f^{a+\frac{b}{x^2}}}{x^6}\,dx}{4b^2\log^2(f)}\\
&= -\frac{35f^{a+\frac{b}{x^2}}}{8b^3x^3\log^3(f)}+\frac{7f^{a+\frac{b}{x^2}}}{4b^2x^5\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^7\log(f)}-\frac{105\int \frac{f^{a+\frac{b}{x^2}}}{x^4}\,dx}{8b^3\log^3(f)}\\
&= \frac{105f^{a+\frac{b}{x^2}}}{16b^4x\log^4(f)}-\frac{35f^{a+\frac{b}{x^2}}}{8b^3x^3\log^3(f)}+\frac{7f^{a+\frac{b}{x^2}}}{4b^2x^5\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^7\log(f)}+\frac{105\int \frac{f^{a+\frac{b}{x^2}}}{x^2}\,dx}{16b^4\log^4(f)}\\
&= \frac{105f^{a+\frac{b}{x^2}}}{16b^4x\log^4(f)}-\frac{35f^{a+\frac{b}{x^2}}}{8b^3x^3\log^3(f)}+\frac{7f^{a+\frac{b}{x^2}}}{4b^2x^5\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^7\log(f)}-\frac{105\text{Subst}\left(\int f^{a+bx^2}\,dx,x,\frac{1}{x}\right)}{16b^4\log^4(f)}\\
&= -\frac{105f^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)}{32b^{9/2}\log^{\frac{9}{2}}(f)}+\frac{105f^{a+\frac{b}{x^2}}}{16b^4x\log^4(f)}-\frac{35f^{a+\frac{b}{x^2}}}{8b^3x^3\log^3(f)}+\frac{7f^{a+\frac{b}{x^2}}}{4b^2x^5\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^7\log(f)}
\end{aligned}$$

Mathematica [**A**]
time = 0.06, size = 100, normalized size = 0.76

$$\frac{f^a\left(-105\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)+\frac{2\sqrt{b}\,f^{\frac{b}{x^2}}\sqrt{\log(f)}\,(105x^6-70bx^4\log(f)+28b^2x^2\log^2(f)-8b^3\log^3(f))}{x^7}\right)}{32b^{9/2}\log^{\frac{9}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x^10,x]
```

```
[Out] (f^a*(-105*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x] + (2*Sqrt[b]*f^(b/x^2)*S
qrt[Log[f]]*(105*x^6 - 70*b*x^4*Log[f] + 28*b^2*x^2*Log[f]^2 - 8*b^3*Log[f]
^3))/x^7))/(32*b^(9/2)*Log[f]^(9/2))
```

Maple [**A**]
time = 0.05, size = 103, normalized size = 0.78

method	result
meijerg	$\frac{f^{a}\sqrt{-b}\left(-\frac{(-b)^{\frac{9}{2}}\sqrt{\ln(f)}\left(-\frac{72b^{3}\ln(f)^{3}}{x^{6}}+\frac{252b^{2}\ln(f)^{2}}{x^{4}}-\frac{630b\ln(f)}{x^{2}}+945\right)e^{\frac{b\ln(f)}{x^{2}}}}{72x\,b^{4}}+\frac{105(-b)^{\frac{9}{2}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\,\sqrt{\ln(f)}}{x}\right)}{16b^{\frac{9}{2}}}\right)}{2b^{5}\ln(f)^{\frac{9}{2}}}$
risch	$-\frac{f^{a}f^{\frac{b}{x^{2}}}}{2x^{7}b\ln(f)}+\frac{7f^{a}f^{\frac{b}{x^{2}}}}{4\ln(f)^{2}b^{2}x^{5}}-\frac{35f^{a}f^{\frac{b}{x^{2}}}}{8\ln(f)^{3}b^{3}x^{3}}+\frac{105f^{a}f^{\frac{b}{x^{2}}}}{16\ln(f)^{4}b^{4}x}-\frac{105f^{a}\sqrt{\pi}\,\mathrm{erf}\left(\frac{\sqrt{-b\ln(f)}}{x}\right)}{32\ln(f)^{4}b^{4}\sqrt{-b\ln(f)}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^10,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*f^a/b^5/ln(f)^(9/2)*(-b)^(1/2)*(-1/72/x*(-b)^(9/2)*ln(f)^(1/2)*(-72*b^3
*ln(f)^3/x^6+252*b^2*ln(f)^2/x^4-630*b*ln(f)/x^2+945)/b^4*exp(b*ln(f)/x^2)+
105/16*(-b)^(9/2)/b^(9/2)*Pi^(1/2)*erfi(b^(1/2)*ln(f)^(1/2)/x))
```

Maxima [A]
time = 0.32, size = 28, normalized size = 0.21

$$\frac{f^{a}\Gamma\left(\frac{9}{2},-\frac{b\log(f)}{x^{2}}\right)}{2\,x^{9}\left(-\frac{b\log(f)}{x^{2}}\right)^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^10,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*gamma(9/2, -b*log(f)/x^2)/(x^9*(-b*log(f)/x^2)^(9/2))
```

Fricas [A]
time = 0.36, size = 100, normalized size = 0.76

$$\frac{105\sqrt{\pi}\sqrt{-b\log(f)}\,f^{a}x^{7}\,\mathrm{erf}\left(\frac{\sqrt{-b\log(f)}}{x}\right)+2\left(105\,bx^{6}\log(f)-70\,b^{2}x^{4}\log(f)^{2}+28\,b^{3}x^{2}\log(f)^{3}-8\,b^{4}\log(f)^{4}\right)f^{\frac{ax^{2}+b}{x^{2}}}}{32\,b^{5}x^{7}\log(f)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^10,x, algorithm="fricas")
```

```
[Out] 1/32*(105*sqrt(pi)*sqrt(-b*log(f))*f^a*x^7*erf(sqrt(-b*log(f))/x) + 2*(105*
b*x^6*log(f) - 70*b^2*x^4*log(f)^2 + 28*b^3*x^2*log(f)^3 - 8*b^4*log(f)^4)*
f^((a*x^2 + b)/x^2))/(b^5*x^7*log(f)^5)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**10,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^10,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)/x^10, x)
```

Mupad [**B**]
time = 3.69, size = 121, normalized size = 0.92

$$-\frac{\frac{f^a\left(105\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\ln(f)}{x\sqrt{b\ln(f)}}\right)-\frac{210\,f^{\frac{b}{x^2}}\sqrt{b\ln(f)}}{x}\right)}{32\sqrt{b\ln(f)}}-\frac{7\,b^2\,f^a\,f^{\frac{b}{x^2}}\ln(f)^2}{4\,x^5}+\frac{b^3\,f^a\,f^{\frac{b}{x^2}}\ln(f)^3}{2\,x^7}+\frac{35\,b\,f^a\,f^{\frac{b}{x^2}}\ln(f)}{8\,x^3}}{b^4\ln(f)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^10,x)
```

```
[Out] -((f^a*(105*pi^(1/2)*erfi((b*log(f))/(x*(b*log(f))^(1/2))) - (210*f^(b/x^2)
*(b*log(f))^(1/2))/x))/(32*(b*log(f))^(1/2)) - (7*b^2*f^a*f^(b/x^2)*log(f)^
2)/(4*x^5) + (b^3*f^a*f^(b/x^2)*log(f)^3)/(2*x^7) + (35*b*f^a*f^(b/x^2)*log
(f))/(8*x^3))/(b^4*log(f)^4)
```

3.152 $\int \frac{f^{a+\frac{b}{x^2}}}{x^{12}}\,dx$

Optimal. Leaf size=34

$$\frac{f^a\Gamma\left(\frac{11}{2},-\frac{b\log(f)}{x^2}\right)}{2x^{11}\left(-\frac{b\log(f)}{x^2}\right)^{11/2}}$$

```
[Out] 1/2*f^a*(1048576/61836869254970658257624840625*GAMMA(51/2,-b*ln(f)/x^2)-104
8576/61836869254970658257624840625*(-b*ln(f)/x^2)^(49/2)*exp(b*ln(f)/x^2)-5
24288/1261976923570829760359690625*(-b*ln(f)/x^2)^(47/2)*exp(b*ln(f)/x^2)-2
62144/26850572841932548092759375*(-b*ln(f)/x^2)^(45/2)*exp(b*ln(f)/x^2)-131
072/596679396487389957616875*(-b*ln(f)/x^2)^(43/2)*exp(b*ln(f)/x^2)-65536/1
3876265034590464130625*(-b*ln(f)/x^2)^(41/2)*exp(b*ln(f)/x^2)-32768/3384454
88648547905625*(-b*ln(f)/x^2)^(39/2)*exp(b*ln(f)/x^2)-16384/867808945252686
9375*(-b*ln(f)/x^2)^(37/2)*exp(b*ln(f)/x^2)-8192/234542958176401875*(-b*ln(
f)/x^2)^(35/2)*exp(b*ln(f)/x^2)-4096/6701227376468625*(-b*ln(f)/x^2)^(33/2)
*exp(b*ln(f)/x^2)-2048/203067496256625*(-b*ln(f)/x^2)^(31/2)*exp(b*ln(f)/x^
2)-1024/6550564395375*(-b*ln(f)/x^2)^(29/2)*exp(b*ln(f)/x^2)-512/2258815308
75*(-b*ln(f)/x^2)^(27/2)*exp(b*ln(f)/x^2)-256/8365982625*(-b*ln(f)/x^2)^(25
/2)*exp(b*ln(f)/x^2)-128/334639305*(-b*ln(f)/x^2)^(23/2)*exp(b*ln(f)/x^2)-6
4/14549535*(-b*ln(f)/x^2)^(21/2)*exp(b*ln(f)/x^2)-32/692835*(-b*ln(f)/x^2)^
(19/2)*exp(b*ln(f)/x^2)-16/36465*(-b*ln(f)/x^2)^(17/2)*exp(b*ln(f)/x^2)-8/2
145*(-b*ln(f)/x^2)^(15/2)*exp(b*ln(f)/x^2)-4/143*(-b*ln(f)/x^2)^(13/2)*exp(
b*ln(f)/x^2)-2/11*(-b*ln(f)/x^2)^(11/2)*exp(b*ln(f)/x^2))/x^11/(-b*ln(f)/x^
2)^(11/2)
```

Rubi [A]

time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$\frac{f^a\text{Gamma}\left(\frac{11}{2},-\frac{b\log(f)}{x^2}\right)}{2x^{11}\left(-\frac{b\log(f)}{x^2}\right)^{11/2}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^12,x]
```

```
[Out] (f^a*Gamma[11/2, -((b*Log[f])/x^2)])/(2*x^11*(-((b*Log[f])/x^2))^(11/2))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
```

```
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^{12}}\,dx = \frac{f^a\Gamma\left(\frac{11}{2},-\frac{b\log(f)}{x^2}\right)}{2x^{11}\left(-\frac{b\log(f)}{x^2}\right)^{11/2}}$$

Mathematica [A]
time = 0.00, size = 34, normalized size = 1.00

$$\frac{f^a\Gamma\left(\frac{11}{2},-\frac{b\log(f)}{x^2}\right)}{2x^{11}\left(-\frac{b\log(f)}{x^2}\right)^{11/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x^12,x]
[Out] (f^a*Gamma[11/2, -((b*Log[f])/x^2)])/(2*x^11*(-((b*Log[f])/x^2))^(11/2))
```

Maple [A]
time = 0.06, size = 115, normalized size = 3.38

method	result
meijerg	$-\frac{f^a\sqrt{-b}\left(\frac{(-b)^{\frac{11}{2}}\sqrt{\ln(f)}\left(\frac{176b^4\ln(f)^4}{x^8}-\frac{792b^3\ln(f)^3}{x^6}+\frac{2772b^2\ln(f)^2}{x^4}-\frac{6930b\ln(f)}{x^2}+10395\right)e^{\frac{b\ln(f)}{x^2}}}{176x\,b^5}-\frac{945(-b)^{\frac{11}{2}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\ldots}{}\right)}{32b^{\frac{11}{2}}}\right)}{2b^6\ln(f)^{\frac{11}{2}}}$
risch	$-\frac{f^a f^{\frac{b}{x^2}}}{2x^9 b\ln(f)}+\frac{9f^a f^{\frac{b}{x^2}}}{4\ln(f)^2b^2x^7}-\frac{63f^a f^{\frac{b}{x^2}}}{8\ln(f)^3b^3x^5}+\frac{315f^a f^{\frac{b}{x^2}}}{16\ln(f)^4b^4x^3}-\frac{945f^a f^{\frac{b}{x^2}}}{32\ln(f)^5b^5x}+\frac{945f^a\sqrt{\pi}\,\mathrm{erf}\left(\frac{\sqrt{-b\ln(f)}}{x}\right)}{64\ln(f)^5b^5\sqrt{-b\ln(f)}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^12,x,method=_RETURNVERBOSE)
[Out] -1/2*f^a/b^6/ln(f)^(11/2)*(-b)^(1/2)*(1/176/x*(-b)^(11/2)*ln(f)^(1/2)*(176*
b^4*ln(f)^4/x^8-792*b^3*ln(f)^3/x^6+2772*b^2*ln(f)^2/x^4-6930*b*ln(f)/x^2+1
0395)/b^5*exp(b*ln(f)/x^2)-945/32*(-b)^(11/2)/b^(11/2)*Pi^(1/2)*erfi(b^(1/2
)*ln(f)^(1/2)/x))
```

Maxima [A]
time = 0.06, size = 28, normalized size = 0.82

$$\frac{f^a\Gamma\left(\frac{11}{2}, -\frac{b\log(f)}{x^2}\right)}{2\,x^{11}\left(-\frac{b\log(f)}{x^2}\right)^{\frac{11}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^12,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*gamma(11/2, -b*log(f)/x^2)/(x^11*(-b*log(f)/x^2)^(11/2))
```

Fricas [A]
time = 0.08, size = 112, normalized size = 3.29

$$-\frac{945\sqrt{\pi}\sqrt{-b\log(f)}\,f^a x^9\operatorname{erf}\left(\frac{\sqrt{-b\log(f)}}{x}\right)+2\left(945\,bx^8\log(f)-630\,b^2x^6\log(f)^2+252\,b^3x^4\log(f)^3-72\,b^4x^2\log(f)^4+16\,b^5\log(f)^5\right)f^{\frac{ax^2+b}{x^2}}}{64\,b^6x^9\log(f)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^12,x, algorithm="fricas")
```

```
[Out] -1/64*(945*sqrt(pi)*sqrt(-b*log(f))*f^a*x^9*erf(sqrt(-b*log(f))/x) + 2*(945
*b*x^8*log(f) - 630*b^2*x^6*log(f)^2 + 252*b^3*x^4*log(f)^3 - 72*b^4*x^2*lo
g(f)^4 + 16*b^5*log(f)^5)*f^((a*x^2 + b)/x^2))/(b^6*x^9*log(f)^6)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**12,x)
```

```
[Out] Timed out
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^12,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)/x^12, x)
```

Mupad [B]
time = 3.71, size = 142, normalized size = 4.18

$$\frac{\frac{f^a\left(945\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\ln(f)}{x\sqrt{b\ln(f)}}\right)-\frac{1890\,f^{\frac{b}{x^2}}\sqrt{b\ln(f)}}{x}\right)}{64\sqrt{b\ln(f)}}-\frac{63\,b^2\,f^a\,f^{\frac{b}{x^2}}\ln(f)^2}{8\,x^5}+\frac{9\,b^3\,f^a\,f^{\frac{b}{x^2}}\ln(f)^3}{4\,x^7}-\frac{b^4\,f^a\,f^{\frac{b}{x^2}}\ln(f)^4}{2\,x^9}+\frac{315\,b\,f^a\,f^{\frac{b}{x^2}}\ln(f)}{16\,x^3}}{b^5\ln(f)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^12,x)
```

```
[Out] ((f^a*(945*pi^(1/2)*erfi((b*log(f))/(x*(b*log(f))^(1/2))) - (1890*f^(b/x^2)
*(b*log(f))^(1/2))/x))/(64*(b*log(f))^(1/2)) - (63*b^2*f^a*f^(b/x^2)*log(f)
^2)/(8*x^5) + (9*b^3*f^a*f^(b/x^2)*log(f)^3)/(4*x^7) - (b^4*f^a*f^(b/x^2)*l
og(f)^4)/(2*x^9) + (315*b*f^a*f^(b/x^2)*log(f))/(16*x^3))/(b^5*log(f)^5)
```

3.153 $\int \frac{f^{a+\frac{b}{x^2}}}{x^{14}} \, dx$

Optimal. Leaf size=34

$$\frac{f^a\Gamma\left(\frac{13}{2},-\frac{b\log(f)}{x^2}\right)}{2x^{13}\left(-\frac{b\log(f)}{x^2}\right)^{13/2}}$$

```
[Out] 1/2*f^a*(524288/5621533568633696205238621875*GAMMA(51/2,-b*ln(f)/x^2)-52428
8/5621533568633696205238621875*(-b*ln(f)/x^2)^(49/2)*exp(b*ln(f)/x^2)-26214
4/114725174870075432759971875*(-b*ln(f)/x^2)^(47/2)*exp(b*ln(f)/x^2)-131072
/2440961167448413462978125*(-b*ln(f)/x^2)^(45/2)*exp(b*ln(f)/x^2)-65536/542
43581498853632510625*(-b*ln(f)/x^2)^(43/2)*exp(b*ln(f)/x^2)-32768/126147863
9508224011875*(-b*ln(f)/x^2)^(41/2)*exp(b*ln(f)/x^2)-16384/3076777169532253
6875*(-b*ln(f)/x^2)^(39/2)*exp(b*ln(f)/x^2)-8192/788917222956988125*(-b*ln(
f)/x^2)^(37/2)*exp(b*ln(f)/x^2)-4096/21322087106945625*(-b*ln(f)/x^2)^(35/2
)*exp(b*ln(f)/x^2)-2048/609202488769875*(-b*ln(f)/x^2)^(33/2)*exp(b*ln(f)/x
^2)-1024/18460681477875*(-b*ln(f)/x^2)^(31/2)*exp(b*ln(f)/x^2)-512/59550585
4125*(-b*ln(f)/x^2)^(29/2)*exp(b*ln(f)/x^2)-256/20534684625*(-b*ln(f)/x^2)^
(27/2)*exp(b*ln(f)/x^2)-128/760543875*(-b*ln(f)/x^2)^(25/2)*exp(b*ln(f)/x^2
)-64/30421755*(-b*ln(f)/x^2)^(23/2)*exp(b*ln(f)/x^2)-32/1322685*(-b*ln(f)/x
^2)^(21/2)*exp(b*ln(f)/x^2)-16/62985*(-b*ln(f)/x^2)^(19/2)*exp(b*ln(f)/x^2)
-8/3315*(-b*ln(f)/x^2)^(17/2)*exp(b*ln(f)/x^2)-4/195*(-b*ln(f)/x^2)^(15/2)*
exp(b*ln(f)/x^2)-2/13*(-b*ln(f)/x^2)^(13/2)*exp(b*ln(f)/x^2))/x^13/(-b*ln(f
)/x^2)^(13/2)
```

Rubi [A]
time = 0.01, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$\frac{f^a\text{Gamma}\left(\frac{13}{2},-\frac{b\log(f)}{x^2}\right)}{2x^{13}\left(-\frac{b\log(f)}{x^2}\right)^{13/2}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^14,x]
```

```
[Out] (f^a*Gamma[13/2, -((b*Log[f])/x^2)])/(2*x^13*(-((b*Log[f])/x^2))^(13/2))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
```

```
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^{14}}\,dx = \frac{f^a\Gamma\left(\frac{13}{2},-\frac{b\log(f)}{x^2}\right)}{2x^{13}\left(-\frac{b\log(f)}{x^2}\right)^{13/2}}$$

Mathematica [A]
time = 0.01, size = 34, normalized size = 1.00

$$\frac{f^a\Gamma\left(\frac{13}{2},-\frac{b\log(f)}{x^2}\right)}{2x^{13}\left(-\frac{b\log(f)}{x^2}\right)^{13/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x^14,x]
[Out] (f^a*Gamma[13/2, -((b*Log[f])/x^2)])/(2*x^13*(-((b*Log[f])/x^2))^(13/2))
```

Maple [A]
time = 0.08, size = 127, normalized size = 3.74

method	result
meijerg	$\frac{f^a\sqrt{-b}\left(-\frac{(-b)^{\frac{13}{2}}\sqrt{\ln(f)}\left(-\frac{416b^5\ln(f)^5}{x^{10}}+\frac{2288b^4\ln(f)^4}{x^8}-\frac{10296b^3\ln(f)^3}{x^6}+\frac{36036b^2\ln(f)^2}{x^4}-\frac{90090b\ln(f)}{x^2}+135135\right)e^{\frac{b\ln(f)}{x^2}}}{416x\,b^6}+\frac{10395(-}{}\right.}{2b^7\ln(f)^{\frac{13}{2}}}$
risch	$-\frac{f^a f^{\frac{b}{x^2}}}{2x^{11}b\ln(f)}+\frac{11f^a f^{\frac{b}{x^2}}}{4\ln(f)^2b^2x^9}-\frac{99f^a f^{\frac{b}{x^2}}}{8\ln(f)^3b^3x^7}+\frac{693f^a f^{\frac{b}{x^2}}}{16\ln(f)^4b^4x^5}-\frac{3465f^a f^{\frac{b}{x^2}}}{32\ln(f)^5b^5x^3}+\frac{10395f^a f^{\frac{b}{x^2}}}{64\ln(f)^6b^6x}-\frac{10395f^a\sqrt{\pi}\,\mathrm{erf}\left(\sqrt{-}\right.}{128\ln(f)^6b^6\sqrt{-b\,l}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^14,x,method=_RETURNVERBOSE)
[Out] 1/2*f^a/b^7/ln(f)^(13/2)*(-b)^(1/2)*(-1/416/x*(-b)^(13/2)*ln(f)^(1/2)*(-416
*b^5*ln(f)^5/x^10+2288*b^4*ln(f)^4/x^8-10296*b^3*ln(f)^3/x^6+36036*b^2*ln(f
)^2/x^4-90090*b*ln(f)/x^2+135135)/b^6*exp(b*ln(f)/x^2)+10395/64*(-b)^(13/2)
/b^(13/2)*Pi^(1/2)*erfi(b^(1/2)*ln(f)^(1/2)/x))
```

Maxima [A]
time = 0.06, size = 28, normalized size = 0.82

$$\frac{f^a\Gamma\left(\frac{13}{2}, -\frac{b\log(f)}{x^2}\right)}{2\,x^{13}\left(-\frac{b\log(f)}{x^2}\right)^{\frac{13}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^14,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*gamma(13/2, -b*log(f)/x^2)/(x^13*(-b*log(f)/x^2)^(13/2))
```

Fricas [A]
time = 0.09, size = 124, normalized size = 3.65

$$\frac{10395\,\sqrt{\pi}\,\sqrt{-b\log(f)}\,f^a x^{11}\operatorname{erf}\left(\frac{\sqrt{-b\log(f)}}{x}\right) + 2\left(10395\,bx^{10}\log(f) - 6930\,b^2x^8\log(f)^2 + 2772\,b^3x^6\log(f)^3 - 792\,b^4x^4\log(f)^4 + 176\,b^5x^2\log(f)^5 - 32\,b^6\log(f)^6\right)f^{\frac{ax^2+b}{x^2}}}{128\,b^7x^{11}\log(f)^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^14,x, algorithm="fricas")
```

```
[Out] 1/128*(10395*sqrt(pi)*sqrt(-b*log(f))*f^a*x^11*erf(sqrt(-b*log(f))/x) + 2*(
10395*b*x^10*log(f) - 6930*b^2*x^8*log(f)^2 + 2772*b^3*x^6*log(f)^3 - 792*b
^4*x^4*log(f)^4 + 176*b^5*x^2*log(f)^5 - 32*b^6*log(f)^6)*f^((a*x^2 + b)/x^
2))/(b^7*x^11*log(f)^7)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**14,x)
```

```
[Out] Timed out
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^14,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)/x^14, x)
```

Mupad [B]
time = 3.71, size = 159, normalized size = 4.68

$$-\frac{\frac{f^a\left(\frac{10395\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\ln(f)}{x\sqrt{b\ln(f)}}\right)}{128}-\frac{10395\,f^{\frac{b}{x^2}}\sqrt{b\ln(f)}}{64\,x}\right)}{\sqrt{b\ln(f)}}-\frac{693\,b^2\,f^{a+\frac{b}{x^2}}\ln(f)^2}{16\,x^5}+\frac{99\,b^3\,f^{a+\frac{b}{x^2}}\ln(f)^3}{8\,x^7}-\frac{11\,b^4\,f^{a+\frac{b}{x^2}}\ln(f)^4}{4\,x^9}+\frac{b^5\,f^{a+\frac{b}{x^2}}\ln(f)^5}{2\,x^{11}}+\frac{3465\,b\,f^{a+\frac{b}{x^2}}\ln(f)}{32\,x^3}}{b^6\ln(f)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^14,x)
```

```
[Out] -((f^a*((10395*pi^(1/2)*erfi((b*log(f))/(x*(b*log(f))^(1/2))))/128 - (10395
*f^(b/x^2)*(b*log(f))^(1/2))/(64*x)))/(b*log(f))^(1/2) - (693*b^2*f^(a + b/
x^2)*log(f)^2)/(16*x^5) + (99*b^3*f^(a + b/x^2)*log(f)^3)/(8*x^7) - (11*b^4
*f^(a + b/x^2)*log(f)^4)/(4*x^9) + (b^5*f^(a + b/x^2)*log(f)^5)/(2*x^11) +
(3465*b*f^(a + b/x^2)*log(f))/(32*x^3))/(b^6*log(f)^6)
```

3.154 $\int f^{a+\frac{b}{x^3}} x^m \, dx$

Optimal. Leaf size=46

$$\frac{1}{3} f^a x^{1+m} \Gamma\left(\frac{1}{3}(-1-m), -\frac{b\log(f)}{x^3}\right)\left(-\frac{b\log(f)}{x^3}\right)^{\frac{1+m}{3}}$$

```
[Out] 1/3*f^a*x^(1+m)*GAMMA(-1/3-1/3*m,-b*ln(f)/x^3)*(-b*ln(f)/x^3)^(1/3+1/3*m)
```

Rubi [A]
time = 0.02, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$\frac{1}{3} f^a x^{m+1}\left(-\frac{b\log(f)}{x^3}\right)^{\frac{m+1}{3}} \text{Gamma}\left(\frac{1}{3}(-m-1), -\frac{b\log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)*x^m,x]
```

```
[Out] (f^a*x^(1 + m)*Gamma[(-1 - m)/3, -((b*Log[f])/x^3)]*(-((b*Log[f])/x^3))^((1
 + m)/3))/3
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x^3}} x^m \, dx = \frac{1}{3} f^a x^{1+m} \Gamma\left(\frac{1}{3}(-1-m), -\frac{b\log(f)}{x^3}\right)\left(-\frac{b\log(f)}{x^3}\right)^{\frac{1+m}{3}}$$

Mathematica [A]
time = 0.01, size = 46, normalized size = 1.00

$$\frac{1}{3} f^a x^{1+m} \Gamma\left(\frac{1}{3}(-1-m), -\frac{b\log(f)}{x^3}\right)\left(-\frac{b\log(f)}{x^3}\right)^{\frac{1+m}{3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)*x^m,x]
```

```
[Out] (f^a*x^(1 + m)*Gamma[(-1 - m)/3, -((b*Log[f])/x^3)]*(-((b*Log[f])/x^3))^((1
 + m)/3))/3
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 168 vs. $2(38) = 76$.
time = 0.03, size = 169, normalized size = 3.67

method	result
meijerg	$-\frac{f^{a}(-b)^{\frac{1}{3}+\frac{m}{3}}\ln(f)^{\frac{1}{3}+\frac{m}{3}}\left(\frac{3x^{-2+m}(-b)^{-\frac{m}{3}-\frac{1}{3}}\ln(f)^{\frac{2}{3}-\frac{m}{3}}b\left(-\frac{b\ln(f)}{x^{3}}\right)^{-\frac{2}{3}+\frac{m}{3}}\Gamma\left(\frac{2}{3}-\frac{m}{3}\right)}{1+m}-\frac{3x^{1+m}(-b)^{-\frac{m}{3}-\frac{1}{3}}\ln(f)^{-\frac{m}{3}-\frac{1}{3}}e^{\frac{b\ln(f)}{x^{3}}}}{1+m}-\frac{3x \cdots}{\cdots}\right.}{3}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)*x^m,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*f^a*(-b)^(1/3+1/3*m)*ln(f)^(1/3+1/3*m)*(3/(1+m)*x^(-2+m)*(-b)^(-1/3*m-
1/3)*ln(f)^(2/3-1/3*m)*b*(-b*ln(f)/x^3)^(-2/3+1/3*m)*GAMMA(2/3-1/3*m)-3/(1+
m)*x^(1+m)*(-b)^(-1/3*m-1/3)*ln(f)^(-1/3*m-1/3)*exp(b*ln(f)/x^3)-3/(1+m)*x^
(-2+m)*(-b)^(-1/3*m-1/3)*ln(f)^(2/3-1/3*m)*b*(-b*ln(f)/x^3)^(-2/3+1/3*m)*GA
MMA(2/3-1/3*m,-b*ln(f)/x^3))
```

Maxima [A]
time = 0.06, size = 38, normalized size = 0.83

$$\frac{1}{3}\,f^{a}x^{m+1}\left(-\frac{b\log\left(f\right)}{x^{3}}\right)^{\frac{1}{3}\,m+\frac{1}{3}}\Gamma\left(-\frac{1}{3}\,m-\frac{1}{3},-\frac{b\log\left(f\right)}{x^{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^m,x, algorithm="maxima")
```

```
[Out] 1/3*f^a*x^(m + 1)*(-b*log(f)/x^3)^(1/3*m + 1/3)*gamma(-1/3*m - 1/3, -b*log(
f)/x^3)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^m,x, algorithm="fricas")
```

```
[Out] integral(f^((a*x^3 + b)/x^3)*x^m, x)
```

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

$$\int f^{a+\frac{b}{x^3}} x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)*x**m,x)
```

```
[Out] Integral(f**(a + b/x**3)*x**m, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^m,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)*x^m, x)
```

Mupad [B]
time = 3.47, size = 54, normalized size = 1.17

$$\frac{f^a\,x^{m+1}\,\mathrm{e}^{\frac{b\,\ln(f)}{2\,x^3}}\,\mathrm{M}_{\frac{m}{6}+\frac{2}{3},-\frac{m}{6}-\frac{1}{6}}\left(\frac{b\,\ln(f)}{x^3}\right)\,\left(\frac{b\,\ln(f)}{x^3}\right)^{\frac{m}{6}-\frac{1}{3}}}{m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)*x^m,x)
```

```
[Out] (f^a*x^(m + 1)*exp((b*log(f))/(2*x^3))*whittakerM(m/6 + 2/3, - m/6 - 1/6, (
b*log(f))/x^3)*((b*log(f))/x^3)^(m/6 - 1/3))/(m + 1)
```

3.155 $\int f^{a+\frac{b}{x^3}} x^{14}\,dx$

Optimal. Leaf size=24

$$-\frac{1}{3}b^5 f^a \Gamma\left(-5,-\frac{b\log(f)}{x^3}\right)\log^5(f)$$

```
[Out] 1/3*f^a*x^15*Ei(6,-b*ln(f)/x^3)
```

Rubi [A]
time = 0.02, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$-\frac{1}{3}b^5 f^a \log^5(f)\text{Gamma}\left(-5,-\frac{b\log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)*x^14,x]
```

```
[Out] -1/3*(b^5*f^a*Gamma[-5, -((b*Log[f])/x^3)]*Log[f]^5)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x^3}} x^{14}\,dx = -\frac{1}{3}b^5 f^a \Gamma\left(-5,-\frac{b\log(f)}{x^3}\right)\log^5(f)$$

Mathematica [A]
time = 0.00, size = 24, normalized size = 1.00

$$-\frac{1}{3}b^5 f^a \Gamma\left(-5,-\frac{b\log(f)}{x^3}\right)\log^5(f)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)*x^14,x]
```

```
[Out] -1/3*(b^5*f^a*Gamma[-5, -((b*Log[f])/x^3)]*Log[f]^5)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 248 vs. $2(18) = 36$.
time = 0.04, size = 249, normalized size = 10.38

method	result
meijerg	$\frac{f^a b^5 \ln(f)^5 \left(-\frac{x^{15}\left(\frac{137b^5\ln(f)^5}{x^{15}}+\frac{300b^4\ln(f)^4}{x^{12}}+\frac{600b^3\ln(f)^3}{x^9}+\frac{1200b^2\ln(f)^2}{x^6}+\frac{1800b\ln(f)}{x^3}+1440\right)}{7200b^5\ln(f)^5}+\frac{x^{15}\left(\frac{6b^4\ln(f)^4}{x^{12}}+\frac{6b^3\ln(f)^3}{x^9}+\frac{12b^2\ln(f)}{x^6}\right.}{720b^5\ln(f)^5}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)*x^14,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*f^a*b^5*ln(f)^5*(-1/7200/b^5/ln(f)^5*x^15*(137*b^5*ln(f)^5/x^15+300*b^4
*ln(f)^4/x^12+600*b^3*ln(f)^3/x^9+1200*b^2*ln(f)^2/x^6+1800*b*ln(f)/x^3+144
0)+1/720/b^5/ln(f)^5*x^15*(6*b^4*ln(f)^4/x^12+6*b^3*ln(f)^3/x^9+12*b^2*ln(f
)^2/x^6+36*b*ln(f)/x^3+144)*exp(b*ln(f)/x^3)+1/120*ln(-b*ln(f)/x^3)+1/120*E
i(1,-b*ln(f)/x^3)+137/7200+1/40*ln(x)-1/120*ln(-b)-1/120*ln(ln(f))+1/5*x^15
/b^5/ln(f)^5+1/4*x^12/b^4/ln(f)^4+1/6*x^9/b^3/ln(f)^3+1/12*x^6/b^2/ln(f)^2+
1/24*x^3/ln(f)/b)
```

Maxima [A]
time = 0.06, size = 22, normalized size = 0.92

$$-\frac{1}{3}\,b^5 f^a \Gamma\left(-5,-\frac{b\log(f)}{x^3}\right)\log(f)^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^14,x, algorithm="maxima")
```

```
[Out] -1/3*b^5*f^a*gamma(-5, -b*log(f)/x^3)*log(f)^5
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 84 vs. $2(18) = 36$.
time = 0.09, size = 84, normalized size = 3.50

$$-\frac{1}{360}\,b^5 f^a \mathrm{Ei}\left(\frac{b\log(f)}{x^3}\right)\log(f)^5+\frac{1}{360}\left(24\,x^{15}+6\,bx^{12}\log(f)+2\,b^2x^9\log(f)^2+b^3x^6\log(f)^3+b^4x^3\log(f)^4\right)f^{\frac{ax^3+b}{x^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^14,x, algorithm="fricas")
```

```
[Out] -1/360*b^5*f^a*Ei(b*log(f)/x^3)*log(f)^5 + 1/360*(24*x^15 + 6*b*x^12*log(f)
 + 2*b^2*x^9*log(f)^2 + b^3*x^6*log(f)^3 + b^4*x^3*log(f)^4)*f^((a*x^3 + b)
/x^3)
```

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

$$\int f^{a+\frac{b}{x^3}} x^{14}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)*x**14,x)
```

```
[Out] Integral(f**(a + b/x**3)*x**14, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^14,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)*x^14, x)
```

Mupad [B]
time = 3.83, size = 102, normalized size = 4.25

$$\frac{b^5\, f^a \ln(f)^5 \operatorname{expint}\left(-\frac{b\ln(f)}{x^3}\right)}{360}+\frac{b^5\, f^a\, f^{\frac{b}{x^3}} \ln(f)^5 \left(\frac{x^3}{120\, b\ln(f)}+\frac{x^6}{120\, b^2 \ln(f)^2}+\frac{x^9}{60\, b^3 \ln(f)^3}+\frac{x^{12}}{20\, b^4 \ln(f)^4}+\frac{x^{15}}{5\, b^5 \ln(f)^5}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)*x^14,x)
```

```
[Out] (b^5*f^a*log(f)^5*expint(-(b*log(f))/x^3))/360 + (b^5*f^a*f^(b/x^3)*log(f)^
5*(x^3/(120*b*log(f)) + x^6/(120*b^2*log(f)^2) + x^9/(60*b^3*log(f)^3) + x^
12/(20*b^4*log(f)^4) + x^15/(5*b^5*log(f)^5)))/3
```

3.156 $\int f^{a+\frac{b}{x^3}} x^{11}\,dx$

Optimal. Leaf size=24

$$\frac{1}{3}b^4 f^a \Gamma\left(-4,-\frac{b\log(f)}{x^3}\right)\log^4(f)$$

```
[Out] 1/3*f^a*x^12*Ei(5,-b*ln(f)/x^3)
```

Rubi [A]
time = 0.02, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$\frac{1}{3}b^4 f^a \log^4(f)\text{Gamma}\left(-4,-\frac{b\log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)*x^11,x]
```

```
[Out] (b^4*f^a*Gamma[-4, -((b*Log[f])/x^3)]*Log[f]^4)/3
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x^3}} x^{11}\,dx = \frac{1}{3}b^4 f^a \Gamma\left(-4,-\frac{b\log(f)}{x^3}\right)\log^4(f)$$

Mathematica [A]
time = 0.00, size = 24, normalized size = 1.00

$$\frac{1}{3}b^4 f^a \Gamma\left(-4,-\frac{b\log(f)}{x^3}\right)\log^4(f)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)*x^11,x]
```

```
[Out] (b^4*f^a*Gamma[-4, -((b*Log[f])/x^3)]*Log[f]^4)/3
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 212 vs. $2(18) = 36$.
time = 0.05, size = 213, normalized size = 8.88

method	result
meijerg	$-\frac{f^{a} b^{4} \ln(f)^{4} \left(\frac{x^{12}\left(\frac{125 b^{4} \ln(f)^{4}}{x^{12}}+\frac{240 b^{3} \ln(f)^{3}}{x^{9}}+\frac{360 b^{2} \ln(f)^{2}}{x^{6}}+\frac{480 b \ln(f)}{x^{3}}+360\right)}{1440 b^{4} \ln(f)^{4}}-\frac{x^{12}\left(\frac{5 b^{3} \ln(f)^{3}}{x^{9}}+\frac{5 b^{2} \ln(f)^{2}}{x^{6}}+\frac{10 b \ln(f)}{x^{3}}+30\right) e^{\frac{b \ln(f)}{x^{3}}}}{120 b^{4} \ln(f)^{4}}-\ln(\cdots\right.}{3}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)*x^11,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*f^a*b^4*ln(f)^4*(1/1440/b^4/ln(f)^4*x^12*(125*b^4*ln(f)^4/x^12+240*b^3
*ln(f)^3/x^9+360*b^2*ln(f)^2/x^6+480*b*ln(f)/x^3+360)-1/120/b^4/ln(f)^4*x^1
2*(5*b^3*ln(f)^3/x^9+5*b^2*ln(f)^2/x^6+10*b*ln(f)/x^3+30)*exp(b*ln(f)/x^3)-
1/24*ln(-b*ln(f)/x^3)-1/24*Ei(1,-b*ln(f)/x^3)-25/288-1/8*ln(x)+1/24*ln(-b)+
1/24*ln(ln(f))-1/4*x^12/b^4/ln(f)^4-1/3*x^9/b^3/ln(f)^3-1/4*x^6/b^2/ln(f)^2
-1/6*x^3/ln(f)/b)
```

Maxima [A]
time = 0.06, size = 22, normalized size = 0.92

$$\frac{1}{3} b^{4} f^{a} \Gamma\left(-4, -\frac{b \log(f)}{x^{3}}\right) \log(f)^{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^11,x, algorithm="maxima")
```

```
[Out] 1/3*b^4*f^a*gamma(-4, -b*log(f)/x^3)*log(f)^4
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 72 vs. $2(18) = 36$.
time = 0.09, size = 72, normalized size = 3.00

$$-\frac{1}{72} b^{4} f^{a} \mathrm{Ei}\left(\frac{b \log(f)}{x^{3}}\right) \log(f)^{4} + \frac{1}{72} \left(6 x^{12} + 2 b x^{9} \log(f) + b^{2} x^{6} \log(f)^{2} + b^{3} x^{3} \log(f)^{3}\right) f^{\frac{a x^{3}+b}{x^{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^11,x, algorithm="fricas")
```

```
[Out] -1/72*b^4*f^a*Ei(b*log(f)/x^3)*log(f)^4 + 1/72*(6*x^12 + 2*b*x^9*log(f) + b
^2*x^6*log(f)^2 + b^3*x^3*log(f)^3)*f^((a*x^3 + b)/x^3)
```

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

$$\int f^{a+\frac{b}{x^{3}}} x^{11}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)*x**11,x)
```

```
[Out] Integral(f**(a + b/x**3)*x**11, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^11,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)*x^11, x)
```

Mupad [B]
time = 3.78, size = 90, normalized size = 3.75

$$\frac{b^4\,f^a\,\ln\left(f\right)^4\,\mathrm{expint}\left(-\frac{b\,\ln(f)}{x^3}\right)}{72}+\frac{b^4\,f^a\,f^{\frac{b}{x^3}}\,\ln\left(f\right)^4\,\left(\frac{x^3}{24\,b\,\ln(f)}+\frac{x^6}{24\,b^2\,\ln(f)^2}+\frac{x^9}{12\,b^3\,\ln(f)^3}+\frac{x^{12}}{4\,b^4\,\ln(f)^4}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)*x^11,x)
```

```
[Out] (b^4*f^a*log(f)^4*expint(-(b*log(f))/x^3))/72 + (b^4*f^a*f^(b/x^3)*log(f)^4
*(x^3/(24*b*log(f)) + x^6/(24*b^2*log(f)^2) + x^9/(12*b^3*log(f)^3) + x^12/
(4*b^4*log(f)^4)))/3
```

3.157 $\int f^{a+\frac{b}{x^3}} x^8 \, dx$

Optimal. Leaf size=81

$$\frac{1}{9} f^{a+\frac{b}{x^3}} x^9 + \frac{1}{18} b f^{a+\frac{b}{x^3}} x^6 \log(f) + \frac{1}{18} b^2 f^{a+\frac{b}{x^3}} x^3 \log^2(f) - \frac{1}{18} b^3 f^a \text{Ei}\left(\frac{b \log(f)}{x^3}\right) \log^3(f)$$

```
[Out] 1/9*f^(a+b/x^3)*x^9+1/18*b*f^(a+b/x^3)*x^6*ln(f)+1/18*b^2*f^(a+b/x^3)*x^3*l
n(f)^2-1/18*b^3*f^a*Ei(b*ln(f)/x^3)*ln(f)^3
```

Rubi [A]
time = 0.06, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2245, 2241}

$$-\frac{1}{18} b^3 f^a \log^3(f) \text{Ei}\left(\frac{b \log(f)}{x^3}\right) + \frac{1}{18} b^2 x^3 \log^2(f) f^{a+\frac{b}{x^3}} + \frac{1}{9} x^9 f^{a+\frac{b}{x^3}} + \frac{1}{18} b x^6 \log(f) f^{a+\frac{b}{x^3}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)*x^8,x]
```

```
[Out] (f^(a + b/x^3)*x^9)/9 + (b*f^(a + b/x^3)*x^6*Log[f])/18 + (b^2*f^(a + b/x^3
)*x^3*Log[f]^2)/18 - (b^3*f^a*ExpIntegralEi[(b*Log[f])/x^3]*Log[f]^3)/18
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int f^{a+\frac{b}{x^3}}x^8\,dx &= \frac{1}{9}f^{a+\frac{b}{x^3}}x^9+\frac{1}{3}(b\log(f))\int f^{a+\frac{b}{x^3}}x^5\,dx\\ &= \frac{1}{9}f^{a+\frac{b}{x^3}}x^9+\frac{1}{18}bf^{a+\frac{b}{x^3}}x^6\log(f)+\frac{1}{6}\left(b^2\log^2(f)\right)\int f^{a+\frac{b}{x^3}}x^2\,dx\\ &= \frac{1}{9}f^{a+\frac{b}{x^3}}x^9+\frac{1}{18}bf^{a+\frac{b}{x^3}}x^6\log(f)+\frac{1}{18}b^2f^{a+\frac{b}{x^3}}x^3\log^2(f)+\frac{1}{6}\left(b^3\log^3(f)\right)\int\frac{f^{a+\frac{b}{x^3}}}{x}\,dx\\ &= \frac{1}{9}f^{a+\frac{b}{x^3}}x^9+\frac{1}{18}bf^{a+\frac{b}{x^3}}x^6\log(f)+\frac{1}{18}b^2f^{a+\frac{b}{x^3}}x^3\log^2(f)-\frac{1}{18}b^3f^a\text{Ei}\left(\frac{b\log(f)}{x^3}\right)\log^3(f)\end{aligned}$$

Mathematica [**A**]
time = 0.02, size = 57, normalized size = 0.70

$$\frac{1}{18}f^a\left(-b^3\text{Ei}\left(\frac{b\log(f)}{x^3}\right)\log^3(f)+f^{\frac{b}{x^3}}x^3\left(2x^6+bx^3\log(f)+b^2\log^2(f)\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)*x^8,x]
```

```
[Out] (f^a*(-(b^3*ExpIntegralEi[(b*Log[f])/x^3]*Log[f]^3) + f^(b/x^3)*x^3*(2*x^6
+ b*x^3*Log[f] + b^2*Log[f]^2)))/18
```

Maple [**B**] Leaf count of result is larger than twice the leaf count of optimal. 176 vs. $2(73) = 146$.
time = 0.03, size = 177, normalized size = 2.19

method	result
meijerg	$\frac{f^a b^3\ln(f)^3\left(-\frac{x^9\left(\frac{22b^3\ln(f)^3}{x^9}+\frac{36b^2\ln(f)^2}{x^6}+\frac{36b\ln(f)}{x^3}+24\right)}{72b^3\ln(f)^3}+\frac{x^9\left(\frac{4b^2\ln(f)^2}{x^6}+\frac{4b\ln(f)}{x^3}+8\right)e^{\frac{b\ln(f)}{x^3}}}{24b^3\ln(f)^3}+\frac{\ln\left(-\frac{b\ln(f)}{x^3}\right)}{6}+\frac{\text{expIntegral}\left(1,-\frac{b\ln(f}{x^3}\right.}{6}\right.}{3}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)*x^8,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*f^a*b^3*ln(f)^3*(-1/72/b^3/ln(f)^3*x^9*(22*b^3*ln(f)^3/x^9+36*b^2*ln(f)
^2/x^6+36*b*ln(f)/x^3+24)+1/24/b^3/ln(f)^3*x^9*(4*b^2*ln(f)^2/x^6+4*b*ln(f)
/x^3+8)*exp(b*ln(f)/x^3)+1/6*ln(-b*ln(f)/x^3)+1/6*Ei(1,-b*ln(f)/x^3)+11/36+
1/2*ln(x)-1/6*ln(-b)-1/6*ln(ln(f))+1/3*x^9/b^3/ln(f)^3+1/2*x^6/b^2/ln(f)^2+
1/2*x^3/ln(f)/b)
```

Maxima [**A**]
time = 0.32, size = 22, normalized size = 0.27

$$-\frac{1}{3}\,b^3f^a\Gamma\left(-3,-\frac{b\log\left(f\right)}{x^3}\right)\log\left(f\right)^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^8,x, algorithm="maxima")
```

```
[Out] -1/3*b^3*f^a*gamma(-3, -b*log(f)/x^3)*log(f)^3
```

Fricas [A]
time = 0.40, size = 60, normalized size = 0.74

$$-\frac{1}{18}\,b^3 f^a \mathrm{Ei}\left(\frac{b\log\left(f\right)}{x^3}\right)\log\left(f\right)^3+\frac{1}{18}\left(2\,x^9+bx^6\log\left(f\right)+b^2x^3\log\left(f\right)^2\right)f^{\frac{ax^3+b}{x^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^8,x, algorithm="fricas")
```

```
[Out] -1/18*b^3*f^a*Ei(b*log(f)/x^3)*log(f)^3 + 1/18*(2*x^9 + b*x^6*log(f) + b^2*
x^3*log(f)^2)*f^((a*x^3 + b)/x^3)
```

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

$$\int f^{a+\frac{b}{x^3}}x^8\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)*x**8,x)
```

```
[Out] Integral(f**(a + b/x**3)*x**8, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^8,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)*x^8, x)
```

Mupad [B]
time = 3.70, size = 69, normalized size = 0.85

$$\frac{b^3\,f^a\,\ln\left(f\right)^3\,\left(f^{\frac{b}{x^3}}\,\left(\frac{x^3}{6\,b\,\ln(f)}+\frac{x^6}{6\,b^2\,\ln(f)^2}+\frac{x^9}{3\,b^3\,\ln(f)^3}\right)+\frac{\mathrm{expint}\left(-\frac{b\,\ln(f)}{x^3}\right)}{6}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)*x^8,x)
```

```
[Out] (b^3*f^a*log(f)^3*(f^(b/x^3)*(x^3/(6*b*log(f)) + x^6/(6*b^2*log(f)^2) + x^9
/(3*b^3*log(f)^3)) + expint(-(b*log(f))/x^3)/6))/3
```

3.158 $\int f^{a+\frac{b}{x^3}} x^5 \, dx$

Optimal. Leaf size=58

$$\frac{1}{6} f^{a+\frac{b}{x^3}} x^6 + \frac{1}{6} b f^{a+\frac{b}{x^3}} x^3 \log(f) - \frac{1}{6} b^2 f^a \text{Ei}\left(\frac{b \log(f)}{x^3}\right) \log^2(f)$$

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

Rubi [A]
time = 0.05, antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2245, 2241}

$$-\frac{1}{6} b^2 f^a \log^2(f) \text{Ei}\left(\frac{b \log(f)}{x^3}\right) + \frac{1}{6} b x^3 \log(f) f^{a+\frac{b}{x^3}} + \frac{1}{6} x^6 f^{a+\frac{b}{x^3}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)*x^5,x]
```

```
[Out] (f^(a + b/x^3)*x^6)/6 + (b*f^(a + b/x^3)*x^3*Log[f])/6 - (b^2*f^a*ExpIntegr
alEi[(b*Log[f])/x^3]*Log[f]^2)/6
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int f^{a+\frac{b}{x^3}} x^5\,dx = \frac{1}{6} f^{a+\frac{b}{x^3}} x^6 + \frac{1}{2}(b\log(f)) \int f^{a+\frac{b}{x^3}} x^2\,dx$$
$$= \frac{1}{6} f^{a+\frac{b}{x^3}} x^6 + \frac{1}{6} b f^{a+\frac{b}{x^3}} x^3 \log(f) + \frac{1}{2}\left(b^2\log^2(f)\right) \int \frac{f^{a+\frac{b}{x^3}}}{x}\,dx$$
$$= \frac{1}{6} f^{a+\frac{b}{x^3}} x^6 + \frac{1}{6} b f^{a+\frac{b}{x^3}} x^3 \log(f) - \frac{1}{6} b^2 f^a \mathrm{Ei}\left(\frac{b\log(f)}{x^3}\right)\log^2(f)$$

Mathematica [A]
time = 0.01, size = 44, normalized size = 0.76

$$\frac{1}{6} f^a\left(-b^2\mathrm{Ei}\left(\frac{b\log(f)}{x^3}\right)\log^2(f) + f^{\frac{b}{x^3}} x^3\left(x^3 + b\log(f)\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)*x^5,x]
```

```
[Out] (f^a*(-(b^2*ExpIntegralEi[(b*Log[f])/x^3]*Log[f]^2) + f^(b/x^3)*x^3*(x^3 +
b*Log[f])))/6
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 140 vs. 2(52) = 104.
time = 0.05, size = 141, normalized size = 2.43

method	result
meijerg	$-\frac{f^a b^2 \ln(f)^2 \left(\frac{x^6\left(\frac{9b^2\ln(f)^2}{x^6}+\frac{12b\ln(f)}{x^3}+6\right)}{12b^2\ln(f)^2} - \frac{x^6\left(3+\frac{3b\ln(f)}{x^3}\right)e^{\frac{b\ln(f)}{x^3}}}{6b^2\ln(f)^2} - \frac{\ln\left(-\frac{b\ln(f)}{x^3}\right)}{2} - \frac{\mathrm{expIntegral}\left(1,-\frac{b\ln(f)}{x^3}\right)}{2} - \frac{3}{4} - \frac{3\ln(x)}{2} + \frac{\ln(-b)}{2} + \ln}{3}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)*x^5,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*f^a*b^2*ln(f)^2*(1/12/b^2/ln(f)^2*x^6*(9*b^2*ln(f)^2/x^6+12*b*ln(f)/x^
3+6)-1/6/b^2/ln(f)^2*x^6*(3+3*b*ln(f)/x^3)*exp(b*ln(f)/x^3)-1/2*ln(-b*ln(f)
/x^3)-1/2*Ei(1,-b*ln(f)/x^3)-3/4-3/2*ln(x)+1/2*ln(-b)+1/2*ln(ln(f))-1/2*x^6
/b^2/ln(f)^2-x^3/ln(f)/b)
```

Maxima [A]
time = 0.32, size = 22, normalized size = 0.38

$$\frac{1}{3}\,b^2 f^a \Gamma\left(-2, -\frac{b\log\left(f\right)}{x^3}\right)\log\left(f\right)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^5,x, algorithm="maxima")
```

```
[Out] 1/3*b^2*f^a*gamma(-2, -b*log(f)/x^3)*log(f)^2
```

Fricas [A]
time = 0.43, size = 47, normalized size = 0.81

$$-\frac{1}{6}b^2f^a\mathrm{Ei}\left(\frac{b\log(f)}{x^3}\right)\log(f)^2+\frac{1}{6}\left(x^6+bx^3\log(f)\right)f^{\frac{ax^3+b}{x^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^5,x, algorithm="fricas")
```

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

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

$$\int f^{a+\frac{b}{x^3}}x^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)*x**5,x)
```

```
[Out] Integral(f**(a + b/x**3)*x**5, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^5,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)*x^5, x)
```

Mupad [B]
time = 3.65, size = 57, normalized size = 0.98

$$\frac{b^2\,f^a\,{\ln\left(f\right)}^2\,\left(f^{\frac{b}{x^3}}\,\left(\frac{x^3}{2\,b\,\ln\left(f\right)}+\frac{x^6}{2\,b^2\,{\ln\left(f\right)}^2}\right)+\frac{\mathrm{expint}\left(-\frac{b\,\ln\left(f\right)}{x^3}\right)}{2}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)*x^5,x)
```

```
[Out] (b^2*f^a*log(f)^2*(f^(b/x^3)*(x^3/(2*b*log(f)) + x^6/(2*b^2*log(f)^2)) + ex
pint(-(b*log(f))/x^3)/2))/3
```

3.159 $\int f^{a+\frac{b}{x^3}} x^2 \, dx$

Optimal. Leaf size=35

$$\frac{1}{3}f^{a+\frac{b}{x^3}}x^3-\frac{1}{3}bf^a\text{Ei}\left(\frac{b\log(f)}{x^3}\right)\log(f)$$

```
[Out] 1/3*f^(a+b/x^3)*x^3-1/3*b*f^a*Ei(b*ln(f)/x^3)*ln(f)
```

Rubi [A]
time = 0.03, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2245, 2241}

$$\frac{1}{3}x^3f^{a+\frac{b}{x^3}}-\frac{1}{3}bf^a\log(f)\text{Ei}\left(\frac{b\log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)*x^2,x]
```

```
[Out] (f^(a + b/x^3)*x^3)/3 - (b*f^a*ExpIntegralEi[(b*Log[f])/x^3]*Log[f])/3
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int f^{a+\frac{b}{x^3}}x^2\,dx &= \frac{1}{3}f^{a+\frac{b}{x^3}}x^3+(b\log(f))\int\frac{f^{a+\frac{b}{x^3}}}{x}\,dx\\ &= \frac{1}{3}f^{a+\frac{b}{x^3}}x^3-\frac{1}{3}bf^a\text{Ei}\left(\frac{b\log(f)}{x^3}\right)\log(f)\end{aligned}$$

Mathematica [A]
time = 0.01, size = 32, normalized size = 0.91

$$\frac{1}{3}f^a\left(f^{\frac{b}{x^3}}x^3-b\text{Ei}\left(\frac{b\log(f)}{x^3}\right)\log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)*x^2,x]
```

```
[Out] (f^a*(f^(b/x^3)*x^3 - b*ExpIntegralEi[(b*Log[f])/x^3]*Log[f]))/3
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 96 vs. $2(31)=62$.
time = 0.03, size = 97, normalized size = 2.77

method	result	size
meijerg	$\frac{f^a b\ln(f)\left(-\frac{x^3\left(2+\frac{2b\ln(f)}{x^3}\right)}{2b\ln(f)}+\frac{x^3 \mathrm{e}^{\frac{b\ln(f)}{x^3}}}{b\ln(f)}+\ln\left(-\frac{b\ln(f)}{x^3}\right)+\text{expIntegral}\left(1,-\frac{b\ln(f)}{x^3}\right)+1+3\ln(x)-\ln(-b)-\ln(\ln(f))+\frac{x^3}{\ln(f)b}\right)}{3}$	97

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)*x^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*f^a*b*ln(f)*(-1/2/b/ln(f)*x^3*(2+2*b*ln(f)/x^3)+1/b/ln(f)*x^3*exp(b*ln(
f)/x^3)+ln(-b*ln(f)/x^3)+Ei(1,-b*ln(f)/x^3)+1+3*ln(x)-ln(-b)-ln(ln(f))+x^3/
ln(f)/b)
```

Maxima [A]
time = 0.32, size = 18, normalized size = 0.51

$$-\frac{1}{3}\,bf^a\Gamma\left(-1,-\frac{b\log\left(f\right)}{x^3}\right)\log\left(f\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^2,x, algorithm="maxima")
```

```
[Out] -1/3*b*f^a*gamma(-1, -b*log(f)/x^3)*log(f)
```

Fricas [A]
time = 0.36, size = 35, normalized size = 1.00

$$\frac{1}{3}\,f^{\frac{ax^3+b}{x^3}}x^3-\frac{1}{3}\,bf^a\text{Ei}\left(\frac{b\log\left(f\right)}{x^3}\right)\log\left(f\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^2,x, algorithm="fricas")
```

```
[Out] 1/3*f^((a*x^3 + b)/x^3)*x^3 - 1/3*b*f^a*Ei(b*log(f)/x^3)*log(f)
```

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

$$\int f^{a+\frac{b}{x^3}}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)*x**2,x)
```

```
[Out] Integral(f**(a + b/x**3)*x**2, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^2,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)*x^2, x)
```

Mupad [B]
time = 3.67, size = 33, normalized size = 0.94

$$\frac{f^a\,f^{\frac{b}{x^3}}\,x^3}{3}+\frac{b\,f^a\,\ln\left(f\right)\,\mathrm{expint}\left(-\frac{b\,\ln(f)}{x^3}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)*x^2,x)
```

```
[Out] (f^a*f^(b/x^3)*x^3)/3 + (b*f^a*log(f)*expint(-(b*log(f))/x^3))/3
```

3.160 $\int \frac{f^{a+\frac{b}{x^3}}}{x} \, dx$

Optimal. Leaf size=15

$$-\frac{1}{3}f^a\text{Ei}\left(\frac{b\log(f)}{x^3}\right)$$

```
[Out] -1/3*f^a*Ei(b*ln(f)/x^3)
```

Rubi [A]
time = 0.02, antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2241}

$$-\frac{1}{3}f^a\text{Ei}\left(\frac{b\log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)/x,x]
```

```
[Out] -1/3*(f^a*ExpIntegralEi[(b*Log[f])/x^3])
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^3}}}{x} \, dx = -\frac{1}{3}f^a\text{Ei}\left(\frac{b\log(f)}{x^3}\right)$$

Mathematica [A]
time = 0.00, size = 15, normalized size = 1.00

$$-\frac{1}{3}f^a\text{Ei}\left(\frac{b\log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)/x,x]
```

```
[Out] -1/3*(f^a*ExpIntegralEi[(b*Log[f])/x^3])
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 40 vs. $2(13) = 26$.
time = 0.03, size = 41, normalized size = 2.73

method	result	size
meijerg	$-\frac{f^{a}\left(-\ln\left(-\frac{b\ln(f)}{x^{3}}\right)-\operatorname{expIntegral}\left(1,-\frac{b\ln(f)}{x^{3}}\right)-3\ln(x)+\ln(-b)+\ln(\ln(f))\right)}{3}$	41

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)/x,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*f^a*(-ln(-b*ln(f)/x^3)-Ei(1,-b*ln(f)/x^3)-3*ln(x)+ln(-b)+ln(ln(f)))
```

Maxima [A]
time = 0.33, size = 13, normalized size = 0.87

$$-\frac{1}{3}\,f^{a}\mathrm{Ei}\left(\frac{b\log\left(f\right)}{x^{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x,x, algorithm="maxima")
```

```
[Out] -1/3*f^a*Ei(b*log(f)/x^3)
```

Fricas [A]
time = 0.36, size = 13, normalized size = 0.87

$$-\frac{1}{3}\,f^{a}\mathrm{Ei}\left(\frac{b\log\left(f\right)}{x^{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x,x, algorithm="fricas")
```

```
[Out] -1/3*f^a*Ei(b*log(f)/x^3)
```

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

$$\int\frac{f^{a+\frac{b}{x^{3}}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)/x,x)
```

```
[Out] Integral(f**(a + b/x**3)/x, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)/x, x)
```

Mupad [B]
time = 3.59, size = 13, normalized size = 0.87

$$-\frac{f^a\,\mathrm{ei}\left(\frac{b\,\ln(f)}{x^3}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)/x,x)
```

```
[Out] -(f^a*ei((b*log(f))/x^3))/3
```

3.161 $\int \frac{f^{a+\frac{b}{x^3}}}{x^4}\,dx$

Optimal. Leaf size=20

$$-\frac{f^{a+\frac{b}{x^3}}}{3b\log(f)}$$

```
[Out] -1/3*f^(a+b/x^3)/b/ln(f)
```

Rubi [A]
time = 0.01, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = $\{2240\}$

$$-\frac{f^{a+\frac{b}{x^3}}}{3b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)/x^4,x]
```

```
[Out] -1/3*f^(a + b/x^3)/(b*Log[f])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^4}\,dx = -\frac{f^{a+\frac{b}{x^3}}}{3b\log(f)}$$

Mathematica [A]
time = 0.00, size = 20, normalized size = 1.00

$$-\frac{f^{a+\frac{b}{x^3}}}{3b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)/x^4,x]
```

```
[Out] -1/3*f^(a + b/x^3)/(b*Log[f])
```

Maple [A]
time = 0.01, size = 19, normalized size = 0.95

method	result	size
derivativedivides	$-\frac{f^{a+\frac{b}{x^{3}}}}{3 b \ln \left(f \right)}$	19
default	$-\frac{f^{a+\frac{b}{x^{3}}}}{3 b \ln \left(f \right)}$	19
norman	$-\frac{{\mathrm e}^{\left(a+\frac{b}{x^{3}}\right) \ln \left(f \right)}}{3 \ln \left(f \right) b}$	21
risch	$-\frac{f^{\frac{a \,x^{3}+b}{x^{3}}}}{3 \ln \left(f \right) b}$	23
meijerg	$\frac{f^{a} \left(1-{\mathrm e}^{\frac{b \ln \left(f \right)}{x^{3}}}\right)}{3 b \ln \left(f \right)}$	25

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*f^(a+b/x^3)/b/ln(f)
```

Maxima [A]
time = 0.28, size = 18, normalized size = 0.90

$$-\frac{f^{a+\frac{b}{x^{3}}}}{3\, b \log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^4,x, algorithm="maxima")
```

```
[Out] -1/3*f^(a + b/x^3)/(b*log(f))
```

Fricas [A]
time = 0.35, size = 22, normalized size = 1.10

$$-\frac{f^{\left(\frac{a x^{3} + b}{x^{3}}\right)}}{3\, b \log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^4,x, algorithm="fricas")
```

```
[Out] -1/3*f^((a*x^3 + b)/x^3)/(b*log(f))
```

Sympy [A]
time = 0.04, size = 27, normalized size = 1.35

$$\begin{cases} -\frac{f^{a+\frac{b}{x^3}}}{3b\log(f)} & \text{for } b\log(f) \neq 0 \\ -\frac{1}{3x^3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)/x**4,x)
```

```
[Out] Piecewise((-f**(a + b/x**3)/(3*b*log(f)), Ne(b*log(f), 0)), (-1/(3*x**3), T
rue))
```

Giac [A]
time = 2.81, size = 22, normalized size = 1.10

$$-\frac{f^{\frac{ax^3+b}{x^3}}}{3\,b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^4,x, algorithm="giac")
```

```
[Out] -1/3*f^((a*x^3 + b)/x^3)/(b*log(f))
```

Mupad [B]
time = 3.44, size = 18, normalized size = 0.90

$$-\frac{f^{a+\frac{b}{x^3}}}{3\,b\,\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)/x^4,x)
```

```
[Out] -f^(a + b/x^3)/(3*b*log(f))
```

3.162 $\int \frac{f^{a+\frac{b}{x^3}}}{x^7} \, dx$

Optimal. Leaf size=44

$$\frac{f^{a+\frac{b}{x^3}}}{3b^2\log^2(f)} - \frac{f^{a+\frac{b}{x^3}}}{3bx^3\log(f)}$$

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

Rubi [A]
time = 0.03, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2243, 2240}

$$\frac{f^{a+\frac{b}{x^3}}}{3b^2\log^2(f)} - \frac{f^{a+\frac{b}{x^3}}}{3bx^3\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)/x^7,x]
```

```
[Out] f^(a + b/x^3)/(3*b^2*Log[f]^2) - f^(a + b/x^3)/(3*b*x^3*Log[f])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\begin{aligned}\int \frac{f^{a+\frac{b}{x^3}}}{x^7} \, dx &= -\frac{f^{a+\frac{b}{x^3}}}{3bx^3\log(f)} - \frac{\int \frac{f^{a+\frac{b}{x^3}}}{x^4} \, dx}{b\log(f)}\\ &= \frac{f^{a+\frac{b}{x^3}}}{3b^2\log^2(f)} - \frac{f^{a+\frac{b}{x^3}}}{3bx^3\log(f)}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 32, normalized size = 0.73

$$\frac{f^{a+\frac{b}{x^3}}(x^3-b\log(f))}{3b^2x^3\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)/x^7,x]
[Out] (f^(a + b/x^3)*(x^3 - b*Log[f]))/(3*b^2*x^3*Log[f]^2)
```

Maple [A]
time = 0.02, size = 35, normalized size = 0.80

method	result	size
meijerg	$-\frac{f^a\left(1-\frac{\left(2-\frac{2b\ln(f)}{x^3}\right)e^{\frac{b\ln(f)}{x^3}}}{2}\right)}{3b^2\ln(f)^2}$	35
risch	$-\frac{(-x^3+b\ln(f))f^{\frac{a\,x^3+b}{x^3}}}{3\ln(f)^2b^2x^3}$	36
norman	$\frac{-\frac{x^3e^{\left(a+\frac{b}{x^3}\right)\ln(f)}}{3\ln(f)b}+\frac{x^6e^{\left(a+\frac{b}{x^3}\right)\ln(f)}}{3b^2\ln(f)^2}}{x^6}$	52

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)/x^7,x,method=_RETURNVERBOSE)
[Out] -1/3*f^a/b^2/ln(f)^2*(1-1/2*(2-2*b*ln(f)/x^3)*exp(b*ln(f)/x^3))
```

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 0.32, size = 22, normalized size = 0.50

$$\frac{f^a\Gamma\left(2,-\frac{b\log(f)}{x^3}\right)}{3\,b^2\log\left(f\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^7,x, algorithm="maxima")
[Out] 1/3*f^a*gamma(2, -b*log(f)/x^3)/(b^2*log(f)^2)
```

Fricas [A]
time = 0.40, size = 34, normalized size = 0.77

$$\frac{(x^3-b\log\left(f\right))f^{\frac{ax^3+b}{x^3}}}{3\,b^2x^3\log\left(f\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^7,x, algorithm="fricas")
```

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

Sympy [A]
time = 0.04, size = 29, normalized size = 0.66

$$\frac{f^{a+\frac{b}{x^3}}\left(-b\log\left(f\right)+x^3\right)}{3b^2x^3\log\left(f\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)/x**7,x)
```

```
[Out] f**(a + b/x**3)*(-b*log(f) + x**3)/(3*b**2*x**3*log(f)**2)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^7,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)/x^7, x)
```

Mupad [B]
time = 3.49, size = 36, normalized size = 0.82

$$-\frac{f^{a+\frac{b}{x^3}}\left(\frac{1}{3\,b\,\ln(f)}-\frac{x^3}{3\,b^2\,\ln(f)^2}\right)}{x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)/x^7,x)
```

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

3.163 $\int \frac{f^{a+\frac{b}{x^3}}}{x^{10}}\,dx$

Optimal. Leaf size=67

$$-\frac{2f^{a+\frac{b}{x^3}}}{3b^3\log^3(f)}+\frac{2f^{a+\frac{b}{x^3}}}{3b^2x^3\log^2(f)}-\frac{f^{a+\frac{b}{x^3}}}{3bx^6\log(f)}$$

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

Rubi [A]
time = 0.05, antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2243, 2240}

$$-\frac{2f^{a+\frac{b}{x^3}}}{3b^3\log^3(f)}+\frac{2f^{a+\frac{b}{x^3}}}{3b^2x^3\log^2(f)}-\frac{f^{a+\frac{b}{x^3}}}{3bx^6\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)/x^10,x]
```

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

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^{10}}\,dx = -\frac{f^{a+\frac{b}{x^3}}}{3bx^6\log(f)} - \frac{2\int \frac{f^{a+\frac{b}{x^3}}}{x^7}\,dx}{b\log(f)}$$
$$= \frac{2f^{a+\frac{b}{x^3}}}{3b^2x^3\log^2(f)} - \frac{f^{a+\frac{b}{x^3}}}{3bx^6\log(f)} + \frac{2\int \frac{f^{a+\frac{b}{x^3}}}{x^4}\,dx}{b^2\log^2(f)}$$
$$= -\frac{2f^{a+\frac{b}{x^3}}}{3b^3\log^3(f)} + \frac{2f^{a+\frac{b}{x^3}}}{3b^2x^3\log^2(f)} - \frac{f^{a+\frac{b}{x^3}}}{3bx^6\log(f)}$$

Mathematica [A]
time = 0.01, size = 45, normalized size = 0.67

$$-\frac{f^{a+\frac{b}{x^3}}\left(2x^6-2bx^3\log(f)+b^2\log^2(f)\right)}{3b^3x^6\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)/x^10,x]
```

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

Maple [A]
time = 0.02, size = 47, normalized size = 0.70

method	result	size
meijerg	$\frac{f^{a}\left(2-\frac{\left(\frac{3b^{2}\ln(f)^{2}}{x^{6}}-\frac{6b\ln(f)}{x^{3}}+6\right)e^{\frac{b\ln(f)}{x^{3}}}}{3}\right)}{3b^{3}\ln(f)^{3}}$	47
risch	$-\frac{\left(2x^{6}-2b\,x^{3}\ln(f)+\ln(f)^{2}b^{2}\right)f^{\frac{a\,x^{3}+b}{x^{3}}}}{3\ln(f)^{3}b^{3}x^{6}}$	48
norman	$\frac{-\frac{x^{3}e^{\left(a+\frac{b}{x^{3}}\right)\ln(f)}}{3\ln(f)b}+\frac{2x^{6}e^{\left(a+\frac{b}{x^{3}}\right)\ln(f)}}{3b^{2}\ln(f)^{2}}-\frac{2x^{9}e^{\left(a+\frac{b}{x^{3}}\right)\ln(f)}}{3b^{3}\ln(f)^{3}}}{x^{9}}$	75

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)/x^10,x,method=_RETURNVERBOSE)
```

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

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 0.33, size = 22, normalized size = 0.33

$$-\frac{f^{a}\Gamma\left(3,-\frac{b\log\left(f\right)}{x^{3}}\right)}{3\,b^{3}\log\left(f\right)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^10,x, algorithm="maxima")
```

```
[Out] -1/3*f^a*gamma(3, -b*log(f)/x^3)/(b^3*log(f)^3)
```

Fricas [A]
time = 0.41, size = 47, normalized size = 0.70

$$-\frac{\left(2\,x^{6}-2\,bx^{3}\log\left(f\right)+b^{2}\log\left(f\right)^{2}\right)f^{\frac{ax^{3}+b}{x^{3}}}}{3\,b^{3}x^{6}\log\left(f\right)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^10,x, algorithm="fricas")
```

```
[Out] -1/3*(2*x^6 - 2*b*x^3*log(f) + b^2*log(f)^2)*f^((a*x^3 + b)/x^3)/(b^3*x^6*l
og(f)^3)
```

Sympy [A]
time = 0.05, size = 44, normalized size = 0.66

$$\frac{f^{a+\frac{b}{x^{3}}}\left(-b^{2}\log\left(f\right)^{2}+2bx^{3}\log\left(f\right)-2x^{6}\right)}{3b^{3}x^{6}\log\left(f\right)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)/x**10,x)
```

```
[Out] f**(a + b/x**3)*(-b**2*log(f)**2 + 2*b*x**3*log(f) - 2*x**6)/(3*b**3*x**6*l
og(f)**3)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^10,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)/x^10, x)
```

Mupad [B]
time = 3.54, size = 48, normalized size = 0.72

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)/x^10,x)
```

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

3.164 $\int \frac{f^{a+\frac{b}{x^3}}}{x^{13}}\,dx$

Optimal. Leaf size=83

$$\frac{2f^{a+\frac{b}{x^3}}}{b^4\log^4(f)}-\frac{2f^{a+\frac{b}{x^3}}}{b^3x^3\log^3(f)}+\frac{f^{a+\frac{b}{x^3}}}{b^2x^6\log^2(f)}-\frac{f^{a+\frac{b}{x^3}}}{3bx^9\log(f)}$$

```
[Out] 2*f^(a+b/x^3)/b^4/ln(f)^4-2*f^(a+b/x^3)/b^3/x^3/ln(f)^3+f^(a+b/x^3)/b^2/x^6
/ln(f)^2-1/3*f^(a+b/x^3)/b/x^9/ln(f)
```

Rubi [A]
time = 0.07, antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2243, 2240}

$$\frac{2f^{a+\frac{b}{x^3}}}{b^4\log^4(f)}-\frac{2f^{a+\frac{b}{x^3}}}{b^3x^3\log^3(f)}+\frac{f^{a+\frac{b}{x^3}}}{b^2x^6\log^2(f)}-\frac{f^{a+\frac{b}{x^3}}}{3bx^9\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)/x^13,x]
```

```
[Out] (2*f^(a + b/x^3))/(b^4*Log[f]^4) - (2*f^(a + b/x^3))/(b^3*x^3*Log[f]^3) + f
^(a + b/x^3)/(b^2*x^6*Log[f]^2) - f^(a + b/x^3)/(3*b*x^9*Log[f])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^{13}}\,dx = -\frac{f^{a+\frac{b}{x^3}}}{3bx^9\log(f)} - \frac{3\int \frac{f^{a+\frac{b}{x^3}}}{x^{10}}\,dx}{b\log(f)}$$
$$= \frac{f^{a+\frac{b}{x^3}}}{b^2x^6\log^2(f)} - \frac{f^{a+\frac{b}{x^3}}}{3bx^9\log(f)} + \frac{6\int \frac{f^{a+\frac{b}{x^3}}}{x^7}\,dx}{b^2\log^2(f)}$$
$$= -\frac{2f^{a+\frac{b}{x^3}}}{b^3x^3\log^3(f)} + \frac{f^{a+\frac{b}{x^3}}}{b^2x^6\log^2(f)} - \frac{f^{a+\frac{b}{x^3}}}{3bx^9\log(f)} - \frac{6\int \frac{f^{a+\frac{b}{x^3}}}{x^4}\,dx}{b^3\log^3(f)}$$
$$= \frac{2f^{a+\frac{b}{x^3}}}{b^4\log^4(f)} - \frac{2f^{a+\frac{b}{x^3}}}{b^3x^3\log^3(f)} + \frac{f^{a+\frac{b}{x^3}}}{b^2x^6\log^2(f)} - \frac{f^{a+\frac{b}{x^3}}}{3bx^9\log(f)}$$

Mathematica [**A**]
time = 0.01, size = 58, normalized size = 0.70

$$\frac{f^{a+\frac{b}{x^3}}\left(6x^9-6bx^6\log(f)+3b^2x^3\log^2(f)-b^3\log^3(f)\right)}{3b^4x^9\log^4(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)/x^13,x]
```

```
[Out] (f^(a + b/x^3)*(6*x^9 - 6*b*x^6*Log[f] + 3*b^2*x^3*Log[f]^2 - b^3*Log[f]^3)
)/(3*b^4*x^9*Log[f]^4)
```

Maple [**A**]
time = 0.04, size = 59, normalized size = 0.71

method	result	size
meijerg	$-\frac{f^{a}\left(6-\frac{\left(-\frac{4b^{3}\ln(f)^{3}}{x^{9}}+\frac{12b^{2}\ln(f)^{2}}{x^{6}}-\frac{24b\ln(f)}{x^{3}}+24\right){e}^{\frac{b\ln(f)}{x^{3}}}}{4}\right)}{3b^{4}\ln(f)^{4}}$	59
risch	$-\frac{\left(-6x^{9}+6b\,x^{6}\ln(f)-3b^{2}x^{3}\ln(f)^{2}+\ln(f)^{3}b^{3}\right)f^{\frac{a\,x^{3}+b}{x^{3}}}}{3\ln(f)^{4}b^{4}x^{9}}$	60
norman	$\frac{\frac{x^{6}{e}^{\left(a+\frac{b}{x^{3}}\right)\ln(f)}}{b^{2}\ln(f)^{2}}-\frac{x^{3}{e}^{\left(a+\frac{b}{x^{3}}\right)\ln(f)}}{3\ln(f)b}-\frac{2x^{9}{e}^{\left(a+\frac{b}{x^{3}}\right)\ln(f)}}{b^{3}\ln(f)^{3}}+\frac{2x^{12}{e}^{\left(a+\frac{b}{x^{3}}\right)\ln(f)}}{b^{4}\ln(f)^{4}}}{x^{12}}$	97

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)/x^13,x,method=_RETURNVERBOSE)
```

[Out] -1/3*f^a/b^4/ln(f)^4*(6-1/4*(-4*b^3*ln(f)^3/x^9+12*b^2*ln(f)^2/x^6-24*b*ln(
f)/x^3+24)*exp(b*ln(f)/x^3))

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 0.34, size = 22, normalized size = 0.27

$$\frac{f^a\Gamma\left(4,-\frac{b\log(f)}{x^3}\right)}{3\,b^4\log\left(f\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(a+b/x^3)/x^13,x, algorithm="maxima")

[Out] 1/3*f^a*gamma(4, -b*log(f)/x^3)/(b^4*log(f)^4)

Fricas [A]
time = 0.40, size = 60, normalized size = 0.72

$$\frac{\left(6\,x^9-6\,bx^6\log\left(f\right)+3\,b^2x^3\log\left(f\right)^2-b^3\log\left(f\right)^3\right)f^{\frac{ax^3+b}{x^3}}}{3\,b^4x^9\log\left(f\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(a+b/x^3)/x^13,x, algorithm="fricas")

[Out] 1/3*(6*x^9 - 6*b*x^6*log(f) + 3*b^2*x^3*log(f)^2 - b^3*log(f)^3)*f^((a*x^3
+ b)/x^3)/(b^4*x^9*log(f)^4)

Sympy [A]
time = 0.06, size = 58, normalized size = 0.70

$$\frac{f^{a+\frac{b}{x^3}}\left(-b^3\log\left(f\right)^3+3b^2x^3\log\left(f\right)^2-6bx^6\log\left(f\right)+6x^9\right)}{3b^4x^9\log\left(f\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f**(a+b/x**3)/x**13,x)

[Out] f**(a + b/x**3)*(-b**3*log(f)**3 + 3*b**2*x**3*log(f)**2 - 6*b*x**6*log(f)
+ 6*x**9)/(3*b**4*x**9*log(f)**4)

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(a+b/x^3)/x^13,x, algorithm="giac")

```
[Out] integrate(f^(a + b/x^3)/x^13, x)
```

Mupad [B]
time = 3.54, size = 60, normalized size = 0.72

$$-\frac{f^{a+\frac{b}{x^3}}\left(\frac{1}{3\,b\,\ln(f)}-\frac{x^3}{b^2\ln(f)^2}+\frac{2\,x^6}{b^3\ln(f)^3}-\frac{2\,x^9}{b^4\ln(f)^4}\right)}{x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)/x^13,x)
```

```
[Out] -(f^(a + b/x^3)*(1/(3*b*log(f)) - x^3/(b^2*log(f)^2) + (2*x^6)/(b^3*log(f)^
3) - (2*x^9)/(b^4*log(f)^4)))/x^9
```

3.165 $\int \frac{f^{a+\frac{b}{x^3}}}{x^{16}}\,dx$

Optimal. Leaf size=69

$$-\frac{f^{a+\frac{b}{x^3}}\left(24x^{12}-24bx^9\log(f)+12b^2x^6\log^2(f)-4b^3x^3\log^3(f)+b^4\log^4(f)\right)}{3b^5x^{12}\log^5(f)}$$

```
[Out] -1/3*f^(a+b/x^3)*(24*x^12-24*b*x^9*ln(f)+12*b^2*x^6*ln(f)^2-4*b^3*x^3*ln(f)
^3+b^4*ln(f)^4)/b^5/x^12/ln(f)^5
```

Rubi [A]
time = 0.02, antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = $\{2249\}$

$$-\frac{f^{a+\frac{b}{x^3}}\left(b^4\log^4(f)-4b^3x^3\log^3(f)+12b^2x^6\log^2(f)-24bx^9\log(f)+24x^{12}\right)}{3b^5x^{12}\log^5(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)/x^16,x]
```

```
[Out] -1/3*(f^(a + b/x^3)*(24*x^12 - 24*b*x^9*Log[f] + 12*b^2*x^6*Log[f]^2 - 4*b^
3*x^3*Log[f]^3 + b^4*Log[f]^4))/(b^5*x^12*Log[f]^5)
```

Rule 2249

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> With[{p = Simplify[(m + 1)/n]}, Simp[(-F^a)*((f/d)^m/(d*n*
((-b)*Log[F])^p))*Simplify[FunctionExpand[Gamma[p, (-b)*(c + d*x)^n*Log[F]]
]], x] /; IGtQ[p, 0]] /; FreeQ[{F, a, b, c, d, e, f, m, n}, x] && EqQ[d*e -
 c*f, 0] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^{16}}\,dx = -\frac{f^a\Gamma\left(5,-\frac{b\log(f)}{x^3}\right)}{3b^5\log^5(f)}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.00, size = 24, normalized size = 0.35

$$-\frac{f^a\Gamma\left(5,-\frac{b\log(f)}{x^3}\right)}{3b^5\log^5(f)}$$

Antiderivative was successfully verified.

[In] Integrate[f^(a + b/x^3)/x^16,x]

[Out] -1/3*(f^a*Gamma[5, -((b*Log[f])/x^3)])/(b^5*Log[f]^5)

Maple [A]
time = 0.04, size = 71, normalized size = 1.03

method	result	size
meijerg	$\frac{f^{a}\left(24-\frac{\left(\frac{5 b^{4} \ln\left(f\right)^{4}}{x^{12}}-\frac{20 b^{3} \ln\left(f\right)^{3}}{x^{9}}+\frac{60 b^{2} \ln\left(f\right)^{2}}{x^{6}}-\frac{120 b \ln\left(f\right)}{x^{3}}+120\right) {\mathrm e}^{\frac{b \ln\left(f\right)}{x^{3}}}}{5}\right)}{3 b^{5} \ln\left(f\right)^{5}}$	71
risch	$-\frac{\left(24 x^{12}-24 b \,x^{9} \ln\left(f\right)+12 b^{2} x^{6} \ln\left(f\right)^{2}-4 b^{3} x^{3} \ln\left(f\right)^{3}+b^{4} \ln\left(f\right)^{4}\right) f^{\frac{a \,x^{3}+b}{x^{3}}}}{3 b^{5} \ln\left(f\right)^{5} x^{12}}$	72
norman	$\frac{-\frac{x^{3} {\mathrm e}^{\left(a +\frac{b}{x^{3}}\right) \ln\left(f\right)}}{3 \ln\left(f\right) b}+\frac{4 x^{6} {\mathrm e}^{\left(a +\frac{b}{x^{3}}\right) \ln\left(f\right)}}{3 b^{2} \ln\left(f\right)^{2}}-\frac{4 x^{9} {\mathrm e}^{\left(a +\frac{b}{x^{3}}\right) \ln\left(f\right)}}{b^{3} \ln\left(f\right)^{3}}+\frac{8 x^{12} {\mathrm e}^{\left(a +\frac{b}{x^{3}}\right) \ln\left(f\right)}}{b^{4} \ln\left(f\right)^{4}}-\frac{8 x^{15} {\mathrm e}^{\left(a +\frac{b}{x^{3}}\right) \ln\left(f\right)}}{b^{5} \ln\left(f\right)^{5}}}{x^{15}}$	121

Verification of antiderivative is not currently implemented for this CAS.

[In] int(f^(a+b/x^3)/x^16,x,method=_RETURNVERBOSE)

[Out] 1/3*f^a/b^5/ln(f)^5*(24-1/5*(5*b^4*ln(f)^4/x^12-20*b^3*ln(f)^3/x^9+60*b^2*l
n(f)^2/x^6-120*b*ln(f)/x^3+120)*exp(b*ln(f)/x^3))

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 0.32, size = 22, normalized size = 0.32

$$-\frac{f^{a}\Gamma\left(5, -\frac{b\log\left(f\right)}{x^{3}}\right)}{3\,b^{5}\log\left(f\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(a+b/x^3)/x^16,x, algorithm="maxima")

[Out] -1/3*f^a*gamma(5, -b*log(f)/x^3)/(b^5*log(f)^5)

Fricas [A]
time = 0.37, size = 71, normalized size = 1.03

$$-\frac{\left(24\,x^{12} - 24\,bx^{9}\log\left(f\right) + 12\,b^{2}x^{6}\log\left(f\right)^{2} - 4\,b^{3}x^{3}\log\left(f\right)^{3} + b^{4}\log\left(f\right)^{4}\right)f^{\frac{ax^{3}+b}{x^{3}}}}{3\,b^{5}x^{12}\log\left(f\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(a+b/x^3)/x^16,x, algorithm="fricas")

```
[Out] -1/3*(24*x^12 - 24*b*x^9*log(f) + 12*b^2*x^6*log(f)^2 - 4*b^3*x^3*log(f)^3
+ b^4*log(f)^4)*f^((a*x^3 + b)/x^3)/(b^5*x^12*log(f)^5)
```

Sympy [A]
time = 0.06, size = 71, normalized size = 1.03

$$\frac{f^{a+\frac{b}{x^3}}\left(-b^4\log\left(f\right)^4+4b^3x^3\log\left(f\right)^3-12b^2x^6\log\left(f\right)^2+24bx^9\log\left(f\right)-24x^{12}\right)}{3b^5x^{12}\log\left(f\right)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)/x**16,x)
```

```
[Out] f**(a + b/x**3)*(-b**4*log(f)**4 + 4*b**3*x**3*log(f)**3 - 12*b**2*x**6*log
(f)**2 + 24*b*x**9*log(f) - 24*x**12)/(3*b**5*x**12*log(f)**5)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^16,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)/x^16, x)
```

Mupad [B]
time = 3.52, size = 72, normalized size = 1.04

$$-\frac{f^{a+\frac{b}{x^3}}\left(\frac{1}{3\,b\,\ln(f)}-\frac{4\,x^3}{3\,b^2\,\ln(f)^2}+\frac{4\,x^6}{b^3\,\ln(f)^3}-\frac{8\,x^9}{b^4\,\ln(f)^4}+\frac{8\,x^{12}}{b^5\,\ln(f)^5}\right)}{x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)/x^16,x)
```

```
[Out] -(f^(a + b/x^3)*(1/(3*b*log(f)) - (4*x^3)/(3*b^2*log(f)^2) + (4*x^6)/(b^3*l
og(f)^3) - (8*x^9)/(b^4*log(f)^4) + (8*x^12)/(b^5*log(f)^5)))/x^12
```

3.166 $\int \frac{f^{a+\frac{b}{x^3}}}{x^{19}} \, dx$

Optimal. Leaf size=82

$$\frac{f^{a+\frac{b}{x^3}} \left(120 x^{15}-120 b x^{12} \log (f)+60 b^2 x^9 \log ^2(f)-20 b^3 x^6 \log ^3(f)+5 b^4 x^3 \log ^4(f)-b^5 \log ^5(f)\right)}{3 b^6 x^{15} \log ^6(f)}$$

```
[Out] 1/3*f^(a+b/x^3)*(120*x^15-120*b*x^12*ln(f)+60*b^2*x^9*ln(f)^2-20*b^3*x^6*ln
(f)^3+5*b^4*x^3*ln(f)^4-b^5*ln(f)^5)/b^6/x^15/ln(f)^6
```

Rubi [A]
time = 0.03, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2249}

$$\frac{f^{a+\frac{b}{x^3}} \left(-b^5 \log ^5(f)+5 b^4 x^3 \log ^4(f)-20 b^3 x^6 \log ^3(f)+60 b^2 x^9 \log ^2(f)-120 b x^{12} \log (f)+120 x^{15}\right)}{3 b^6 x^{15} \log ^6(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)/x^19,x]
```

```
[Out] (f^(a + b/x^3)*(120*x^15 - 120*b*x^12*Log[f] + 60*b^2*x^9*Log[f]^2 - 20*b^3
*x^6*Log[f]^3 + 5*b^4*x^3*Log[f]^4 - b^5*Log[f]^5))/(3*b^6*x^15*Log[f]^6)
```

Rule 2249

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> With[{p = Simplify[(m + 1)/n]}, Simp[(-F^a)*((f/d)^m/(d*n*
((-b)*Log[F])^p))*Simplify[FunctionExpand[Gamma[p, (-b)*(c + d*x)^n*Log[F]]
]], x] /; IGtQ[p, 0]] /; FreeQ[{F, a, b, c, d, e, f, m, n}, x] && EqQ[d*e -
 c*f, 0] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^{19}} \, dx = \frac{f^a \Gamma\left(6,-\frac{b \log (f)}{x^3}\right)}{3 b^6 \log ^6(f)}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.00, size = 24, normalized size = 0.29

$$\frac{f^a \Gamma\left(6,-\frac{b \log (f)}{x^3}\right)}{3 b^6 \log ^6(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)/x^19,x]
[Out] (f^a*Gamma[6, -((b*Log[f])/x^3)])/(3*b^6*Log[f]^6)
```

Maple [A]
time = 0.02, size = 83, normalized size = 1.01

method	result	size
meijerg	$-\frac{f^{a}\left(120-\frac{\left(-\frac{6 b^{5} \ln \left(f\right)^{5}}{x^{15}}+\frac{30 b^{4} \ln \left(f\right)^{4}}{x^{12}}-\frac{120 b^{3} \ln \left(f\right)^{3}}{x^{9}}+\frac{360 b^{2} \ln \left(f\right)^{2}}{x^{6}}-\frac{720 b \ln \left(f\right)}{x^{3}}+720\right) {\mathrm e}^{\frac{b \ln \left(f\right)}{x^{3}}}}{6}\right)}{3 b^{6} \ln \left(f\right)^{6}}$	83
risch	$-\frac{\left(-120 x^{15}+120 b \,x^{12} \ln \left(f\right)-60 b^{2} x^{9} \ln \left(f\right)^{2}+20 b^{3} x^{6} \ln \left(f\right)^{3}-5 b^{4} x^{3} \ln \left(f\right)^{4}+b^{5} \ln \left(f\right)^{5}\right) f^{\frac{a \,x^{3}+b}{x^{3}}}}{3 \ln \left(f\right)^{6} b^{6} x^{15}}$	84

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)/x^19,x,method=_RETURNVERBOSE)
[Out] -1/3*f^a/b^6/ln(f)^6*(120-1/6*(-6*b^5*ln(f)^5/x^15+30*b^4*ln(f)^4/x^12-120*
b^3*ln(f)^3/x^9+360*b^2*ln(f)^2/x^6-720*b*ln(f)/x^3+720)*exp(b*ln(f)/x^3))
```

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 0.33, size = 22, normalized size = 0.27

$$\frac{f^{a}\Gamma\left(6, -\frac{b \log\left(f\right)}{x^{3}}\right)}{3 \, b^{6} \log\left(f\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^19,x, algorithm="maxima")
[Out] 1/3*f^a*gamma(6, -b*log(f)/x^3)/(b^6*log(f)^6)
```

Fricas [A]
time = 0.42, size = 84, normalized size = 1.02

$$\frac{{\left(120 \, x^{15} - 120 \, b x^{12} \log\left(f\right) + 60 \, b^{2} x^{9} \log\left(f\right)^{2} - 20 \, b^{3} x^{6} \log\left(f\right)^{3} + 5 \, b^{4} x^{3} \log\left(f\right)^{4} - b^{5} \log\left(f\right)^{5}\right)} f^{\frac{a x^{3} + b}{x^{3}}}}{3 \, b^{6} x^{15} \log\left(f\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^19,x, algorithm="fricas")
[Out] 1/3*(120*x^15 - 120*b*x^12*log(f) + 60*b^2*x^9*log(f)^2 - 20*b^3*x^6*log(f)
^3 + 5*b^4*x^3*log(f)^4 - b^5*log(f)^5)*f^((a*x^3 + b)/x^3)/(b^6*x^15*log(f
)^6)
```

Sympy [A]
time = 0.07, size = 85, normalized size = 1.04

$$\frac{f^{a+\frac{b}{x^3}}\left(-b^5\log{(f)}^5+5b^4x^3\log{(f)}^4-20b^3x^6\log{(f)}^3+60b^2x^9\log{(f)}^2-120bx^{12}\log{(f)}+120x^{15}\right)}{3b^6x^{15}\log{(f)}^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)/x**19,x)
```

```
[Out] f**(a + b/x**3)*(-b**5*log(f)**5 + 5*b**4*x**3*log(f)**4 - 20*b**3*x**6*log
(f)**3 + 60*b**2*x**9*log(f)**2 - 120*b*x**12*log(f) + 120*x**15)/(3*b**6*x
**15*log(f)**6)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^19,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)/x^19, x)
```

Mupad [B]
time = 3.59, size = 84, normalized size = 1.02

$$-\frac{f^{a+\frac{b}{x^3}}\left(\frac{1}{3\,b\,\ln(f)}-\frac{5\,x^3}{3\,b^2\,\ln(f)^2}+\frac{20\,x^6}{3\,b^3\,\ln(f)^3}-\frac{20\,x^9}{b^4\,\ln(f)^4}+\frac{40\,x^{12}}{b^5\,\ln(f)^5}-\frac{40\,x^{15}}{b^6\,\ln(f)^6}\right)}{x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)/x^19,x)
```

```
[Out] -(f^(a + b/x^3)*(1/(3*b*log(f)) - (5*x^3)/(3*b^2*log(f)^2) + (20*x^6)/(3*b^
3*log(f)^3) - (20*x^9)/(b^4*log(f)^4) + (40*x^12)/(b^5*log(f)^5) - (40*x^15
)/(b^6*log(f)^6)))/x^15
```

3.167 $\int f^{a+\frac{b}{x^3}} x^4\,dx$

Optimal. Leaf size=34

$$\frac{1}{3} f^a x^5 \Gamma\left(-\frac{5}{3},-\frac{b\log(f)}{x^3}\right)\left(-\frac{b\log(f)}{x^3}\right)^{5/3}$$

```
[Out] 1/3*f^a*x^5*GAMMA(-5/3,-b*ln(f)/x^3)*(-b*ln(f)/x^3)^(5/3)
```

Rubi [A]
time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = $\{2250\}$

$$\frac{1}{3} x^5 f^a\left(-\frac{b\log(f)}{x^3}\right)^{5/3} \text{Gamma}\left(-\frac{5}{3},-\frac{b\log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)*x^4,x]
```

```
[Out] (f^a*x^5*Gamma[-5/3, -((b*Log[f])/x^3)]*(-((b*Log[f])/x^3))^(5/3))/3
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x^3}} x^4\,dx = \frac{1}{3} f^a x^5 \Gamma\left(-\frac{5}{3},-\frac{b\log(f)}{x^3}\right)\left(-\frac{b\log(f)}{x^3}\right)^{5/3}$$

Mathematica [A]
time = 0.00, size = 34, normalized size = 1.00

$$\frac{1}{3} f^a x^5 \Gamma\left(-\frac{5}{3},-\frac{b\log(f)}{x^3}\right)\left(-\frac{b\log(f)}{x^3}\right)^{5/3}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)*x^4,x]
```

```
[Out] (f^a*x^5*Gamma[-5/3, -((b*Log[f])/x^3)]*(-((b*Log[f])/x^3))^(5/3))/3
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 119 vs. $2(28) = 56$.
time = 0.03, size = 120, normalized size = 3.53

method	result	size
meijerg	$-\frac{f^{a}(-b)^{\frac{5}{3}}\ln(f)^{\frac{5}{3}}\left(\frac{3\ln(f)^{\frac{1}{3}}b^{2}\pi\sqrt{3}}{5x(-b)^{\frac{5}{3}}\Gamma\left(\frac{2}{3}\right)\left(-\frac{b\ln(f)}{x^{3}}\right)^{\frac{1}{3}}}-\frac{3x^{5}\left(\frac{3b\ln(f)}{2x^{3}}+1\right)\mathrm{e}^{\frac{b\ln(f)}{x^{3}}}}{5(-b)^{\frac{5}{3}}\ln(f)^{\frac{5}{3}}}-\frac{9\ln(f)^{\frac{1}{3}}b^{2}\Gamma\left(\frac{1}{3},-\frac{b\ln(f)}{x^{3}}\right)}{10x(-b)^{\frac{5}{3}}\left(-\frac{b\ln(f)}{x^{3}}\right)^{\frac{1}{3}}}\right)}{3}$	120

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)*x^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*f^a*(-b)^(5/3)*ln(f)^(5/3)*(3/5/x/(-b)^(5/3)*ln(f)^(1/3)*b^2*Pi*3^(1/2
)/GAMMA(2/3)/(-b*ln(f)/x^3)^(1/3)-3/5*x^5/(-b)^(5/3)/ln(f)^(5/3)*(3/2*b*ln(
f)/x^3+1)*exp(b*ln(f)/x^3)-9/10/x/(-b)^(5/3)*ln(f)^(1/3)*b^2/(-b*ln(f)/x^3)
^(1/3)*GAMMA(1/3,-b*ln(f)/x^3))
```

Maxima [A]
time = 0.06, size = 28, normalized size = 0.82

$$\frac{1}{3}\,f^{a}x^{5}\left(-\frac{b\log\left(f\right)}{x^{3}}\right)^{\frac{5}{3}}\Gamma\left(-\frac{5}{3},-\frac{b\log\left(f\right)}{x^{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^4,x, algorithm="maxima")
```

```
[Out] 1/3*f^a*x^5*(-b*log(f)/x^3)^(5/3)*gamma(-5/3, -b*log(f)/x^3)
```

Fricas [A]
time = 0.09, size = 55, normalized size = 1.62

$$-\frac{3}{10}\left(-b\log\left(f\right)\right)^{\frac{2}{3}}bf^{a}\Gamma\left(\frac{1}{3},-\frac{b\log\left(f\right)}{x^{3}}\right)\log\left(f\right)+\frac{1}{10}\left(2\,x^{5}+3\,bx^{2}\log\left(f\right)\right)f^{\frac{ax^{3}+b}{x^{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^4,x, algorithm="fricas")
```

```
[Out] -3/10*(-b*log(f))^(2/3)*b*f^a*gamma(1/3, -b*log(f)/x^3)*log(f) + 1/10*(2*x^
5 + 3*b*x^2*log(f))*f^((a*x^3 + b)/x^3)
```

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

$$\int f^{a+\frac{b}{x^{3}}}x^{4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)*x**4,x)
```

```
[Out] Integral(f**(a + b/x**3)*x**4, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^4,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)*x^4, x)
```

Mupad [B]
time = 3.57, size = 88, normalized size = 2.59

$$\frac{f^a\,f^{\frac{b}{x^3}}\,x^5}{5}+\frac{3\,f^a\,x^5\,\Gamma\left(\frac{1}{3},-\frac{b\,\ln(f)}{x^3}\right)\,{\left(-\frac{b\,\ln(f)}{x^3}\right)}^{5/3}}{10}+\frac{3\,b\,f^a\,f^{\frac{b}{x^3}}\,x^2\,\ln\left(f\right)}{10}-\frac{\pi\,\sqrt{3}\,f^a\,x^5\,{\left(-\frac{b\,\ln(f)}{x^3}\right)}^{5/3}}{5\,\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)*x^4,x)
```

```
[Out] (f^a*f^(b/x^3)*x^5)/5 + (3*f^a*x^5*igamma(1/3, -(b*log(f))/x^3)*(-(b*log(f)
)/x^3)^(5/3))/10 + (3*b*f^a*f^(b/x^3)*x^2*log(f))/10 - (3^(1/2)*f^a*x^5*pi*
(-(b*log(f))/x^3)^(5/3))/(5*gamma(2/3))
```

3.168 $\int f^{a+\frac{b}{x^3}} x^3 \, dx$

Optimal. Leaf size=34

$$\frac{1}{3} f^a x^4 \Gamma\left(-\frac{4}{3}, -\frac{b \log(f)}{x^3}\right) \left(-\frac{b \log(f)}{x^3}\right)^{4/3}$$

```
[Out] 1/3*f^a*x^4*GAMMA(-4/3,-b*ln(f)/x^3)*(-b*ln(f)/x^3)^(4/3)
```

Rubi [A]
time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = $\{2250\}$

$$\frac{1}{3} x^4 f^a \left(-\frac{b \log(f)}{x^3}\right)^{4/3} \text{Gamma}\left(-\frac{4}{3}, -\frac{b \log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)*x^3,x]
```

```
[Out] (f^a*x^4*Gamma[-4/3, -((b*Log[f])/x^3)]*(-((b*Log[f])/x^3))^(4/3))/3
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x^3}} x^3 \, dx = \frac{1}{3} f^a x^4 \Gamma\left(-\frac{4}{3}, -\frac{b \log(f)}{x^3}\right) \left(-\frac{b \log(f)}{x^3}\right)^{4/3}$$

Mathematica [A]
time = 0.00, size = 34, normalized size = 1.00

$$\frac{1}{3} f^a x^4 \Gamma\left(-\frac{4}{3}, -\frac{b \log(f)}{x^3}\right) \left(-\frac{b \log(f)}{x^3}\right)^{4/3}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)*x^3,x]
```

[Out] (f^a*x^4*Gamma[-4/3, -((b*Log[f])/x^3)]*(-((b*Log[f])/x^3))^(4/3))/3

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 114 vs. 2(28) = 56.
time = 0.03, size = 115, normalized size = 3.38

method	result	size
meijerg	$\frac{f^{a} b \ln\left(f\right)^{\frac{4}{3}} \left(-b\right)^{\frac{1}{3}} \left(\frac{9 \ln\left(f\right)^{\frac{2}{3}} b^{2} \Gamma\left(\frac{2}{3}\right)}{4 x^{2} \left(-b\right)^{\frac{4}{3}} \left(-\frac{b \ln\left(f\right)}{x^{3}}\right)^{\frac{2}{3}}}-\frac{3 x^{4} \left(\frac{3 b \ln\left(f\right)}{x^{3}}+1\right) {\mathrm e}^{\frac{b \ln\left(f\right)}{x^{3}}}}{4 \left(-b\right)^{\frac{4}{3}} \ln\left(f\right)^{\frac{4}{3}}}-\frac{9 \ln\left(f\right)^{\frac{2}{3}} b^{2} \Gamma\left(\frac{2}{3}, -\frac{b \ln\left(f\right)}{x^{3}}\right)}{4 x^{2} \left(-b\right)^{\frac{4}{3}} \left(-\frac{b \ln\left(f\right)}{x^{3}}\right)^{\frac{2}{3}}}\right)}{3}$	115

Verification of antiderivative is not currently implemented for this CAS.

[In] int(f^(a+b/x^3)*x^3,x,method=_RETURNVERBOSE)

[Out] 1/3*f^a*b*ln(f)^(4/3)*(-b)^(1/3)*(9/4/x^2/(-b)^(4/3)*ln(f)^(2/3)*b^2*GAMMA(2/3)/(-b*ln(f)/x^3)^(2/3)-3/4*x^4/(-b)^(4/3)/ln(f)^(4/3)*(3*b*ln(f)/x^3+1)*exp(b*ln(f)/x^3)-9/4/x^2/(-b)^(4/3)*ln(f)^(2/3)*b^2/(-b*ln(f)/x^3)^(2/3)*GAMMA(2/3,-b*ln(f)/x^3))

Maxima [A]
time = 0.06, size = 28, normalized size = 0.82

$$\frac{1}{3}\, f^{a} x^{4} \left(-\frac{b \log\left(f\right)}{x^{3}}\right)^{\frac{4}{3}} \Gamma\left(-\frac{4}{3}, -\frac{b \log\left(f\right)}{x^{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(a+b/x^3)*x^3,x, algorithm="maxima")

[Out] 1/3*f^a*x^4*(-b*log(f)/x^3)^(4/3)*gamma(-4/3, -b*log(f)/x^3)

Fricas [A]
time = 0.11, size = 51, normalized size = 1.50

$$-\frac{3}{4} \left(-b \log\left(f\right)\right)^{\frac{1}{3}} b f^{a} \Gamma\left(\frac{2}{3}, -\frac{b \log\left(f\right)}{x^{3}}\right) \log\left(f\right) + \frac{1}{4} \left(x^{4} + 3 \, b x \log\left(f\right)\right) f^{\frac{a x^{3} + b}{x^{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(a+b/x^3)*x^3,x, algorithm="fricas")

[Out] -3/4*(-b*log(f))^(1/3)*b*f^a*gamma(2/3, -b*log(f)/x^3)*log(f) + 1/4*(x^4 + 3*b*x*log(f))*f^((a*x^3 + b)/x^3)

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

$$\int f^{a + \frac{b}{x^{3}}} x^{3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)*x**3,x)
```

```
[Out] Integral(f**(a + b/x**3)*x**3, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^(a + b/x^3)*x^3, x)
```

Mupad [B]
time = 3.59, size = 80, normalized size = 2.35

$$\frac{f^a\,f^{\frac{b}{x^3}}\,x^4}{4}-\frac{3\,f^a\,x^4\,\Gamma\left(\frac{2}{3}\right)\,{\left(-\frac{b\,\ln(f)}{x^3}\right)}^{4/3}}{4}+\frac{3\,f^a\,x^4\,\Gamma\left(\frac{2}{3},-\frac{b\,\ln(f)}{x^3}\right)\,{\left(-\frac{b\,\ln(f)}{x^3}\right)}^{4/3}}{4}+\frac{3\,b\,f^a\,f^{\frac{b}{x^3}}\,x\,\ln\left(f\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)*x^3,x)
```

```
[Out] (f^a*f^(b/x^3)*x^4)/4 - (3*f^a*x^4*gamma(2/3)*(-(b*log(f))/x^3)^(4/3))/4 +
(3*f^a*x^4*igamma(2/3, -(b*log(f))/x^3)*(-(b*log(f))/x^3)^(4/3))/4 + (3*b*f
^a*f^(b/x^3)*x*log(f))/4
```

3.169 $\int f^{a+\frac{b}{x^3}} x \, dx$

Optimal. Leaf size=34

$$\frac{1}{3} f^a x^2 \Gamma\left(-\frac{2}{3}, -\frac{b \log(f)}{x^3}\right) \left(-\frac{b \log(f)}{x^3}\right)^{2/3}$$

```
[Out] 1/3*f^a*x^2*GAMMA(-2/3,-b*ln(f)/x^3)*(-b*ln(f)/x^3)^(2/3)
```

Rubi [A]
time = 0.01, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2250}

$$\frac{1}{3} x^2 f^a \left(-\frac{b \log(f)}{x^3}\right)^{2/3} \text{Gamma}\left(-\frac{2}{3}, -\frac{b \log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)*x,x]
```

```
[Out] (f^a*x^2*Gamma[-2/3, -((b*Log[f])/x^3)]*(-((b*Log[f])/x^3))^(2/3))/3
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x^3}} x \, dx = \frac{1}{3} f^a x^2 \Gamma\left(-\frac{2}{3}, -\frac{b \log(f)}{x^3}\right) \left(-\frac{b \log(f)}{x^3}\right)^{2/3}$$

Mathematica [A]
time = 0.00, size = 34, normalized size = 1.00

$$\frac{1}{3} f^a x^2 \Gamma\left(-\frac{2}{3}, -\frac{b \log(f)}{x^3}\right) \left(-\frac{b \log(f)}{x^3}\right)^{2/3}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)*x,x]
```

```
[Out] (f^a*x^2*Gamma[-2/3, -((b*Log[f])/x^3)]*(-((b*Log[f])/x^3))^(2/3))/3
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 104 vs. $2(28) = 56$.
time = 0.02, size = 105, normalized size = 3.09

method	result	size
meijerg	$-\frac{f^{a}(-b)^{\frac{2}{3}} \ln(f)^{\frac{2}{3}}\left(\frac{\ln(f)^{\frac{1}{3}} b\pi\sqrt{3}}{x(-b)^{\frac{2}{3}}\Gamma\left(\frac{2}{3}\right)\left(-\frac{b\ln(f)}{x^{3}}\right)^{\frac{1}{3}}}-\frac{3x^{2}\mathrm{e}^{\frac{b\ln(f)}{x^{3}}}}{2(-b)^{\frac{2}{3}}\ln(f)^{\frac{2}{3}}}-\frac{3\ln(f)^{\frac{1}{3}} b\Gamma\left(\frac{1}{3},-\frac{b\ln(f)}{x^{3}}\right)}{2x(-b)^{\frac{2}{3}}\left(-\frac{b\ln(f)}{x^{3}}\right)^{\frac{1}{3}}}\right)}{3}$	105

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)*x,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*f^a*(-b)^(2/3)*ln(f)^(2/3)*(1/x/(-b)^(2/3)*ln(f)^(1/3)*b*Pi*3^(1/2)/GA
MMA(2/3)/(-b*ln(f)/x^3)^(1/3)-3/2*x^2/(-b)^(2/3)/ln(f)^(2/3)*exp(b*ln(f)/x^
3)-3/2/x/(-b)^(2/3)*ln(f)^(1/3)*b/(-b*ln(f)/x^3)^(1/3)*GAMMA(1/3,-b*ln(f)/x
^3))
```

Maxima [A]
time = 0.06, size = 28, normalized size = 0.82

$$\frac{1}{3}\,f^{a}x^{2}\left(-\frac{b\log\left(f\right)}{x^{3}}\right)^{\frac{2}{3}}\Gamma\left(-\frac{2}{3},-\frac{b\log\left(f\right)}{x^{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*f^a*x^2*(-b*log(f)/x^3)^(2/3)*gamma(-2/3, -b*log(f)/x^3)
```

Fricas [A]
time = 0.10, size = 41, normalized size = 1.21

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*f^((a*x^3 + b)/x^3)*x^2 - 1/2*(-b*log(f))^(2/3)*f^a*gamma(1/3, -b*log(f
)/x^3)
```

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

$$\int f^{a+\frac{b}{x^{3}}}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)*x,x)
```

```
[Out] Integral(f**(a + b/x**3)*x, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^(a + b/x^3)*x, x)
```

Mupad [B]
time = 3.57, size = 70, normalized size = 2.06

$$\frac{f^a\,f^{\frac{b}{x^3}}\,x^2}{2}-\frac{f^a\,x^2\,\Gamma\left(\frac{1}{3},-\frac{b\,\ln(f)}{x^3}\right)\,\left(-\frac{b\,\ln(f)}{x^3}\right)^{2/3}}{2}+\frac{\pi\,\sqrt{3}\,f^a\,x^2\,\left(-\frac{b\,\ln(f)}{x^3}\right)^{2/3}}{3\,\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)*x,x)
```

```
[Out] (f^a*f^(b/x^3)*x^2)/2 - (f^a*x^2*igamma(1/3, -(b*log(f))/x^3)*(-(b*log(f))/
x^3)^(2/3))/2 + (3^(1/2)*f^a*x^2*pi*(-(b*log(f))/x^3)^(2/3))/(3*gamma(2/3))
```

3.170 $\int f^{a+\frac{b}{x^3}}\,dx$

Optimal. Leaf size=32

$$\frac{1}{3}f^a x\Gamma\left(-\frac{1}{3},-\frac{b\log(f)}{x^3}\right)\sqrt[3]{-\frac{b\log(f)}{x^3}}$$

```
[Out] 1/3*f^a*x*GAMMA(-1/3,-b*ln(f)/x^3)*(-b*ln(f)/x^3)^(1/3)
```

Rubi [A]
time = 0.00, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2239}

$$\frac{1}{3}xf^a\sqrt[3]{-\frac{b\log(f)}{x^3}}\,\text{Gamma}\left(-\frac{1}{3},-\frac{b\log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3),x]
```

```
[Out] (f^a*x*Gamma[-1/3, -((b*Log[f])/x^3)]*(-((b*Log[f])/x^3))^(1/3))/3
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] && !IntegerQ[2/n]
```

Rubi steps

$$\int f^{a+\frac{b}{x^3}}\,dx=\frac{1}{3}f^a x\Gamma\left(-\frac{1}{3},-\frac{b\log(f)}{x^3}\right)\sqrt[3]{-\frac{b\log(f)}{x^3}}$$

Mathematica [A]
time = 0.00, size = 32, normalized size = 1.00

$$\frac{1}{3}f^a x\Gamma\left(-\frac{1}{3},-\frac{b\log(f)}{x^3}\right)\sqrt[3]{-\frac{b\log(f)}{x^3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3),x]
```

[Out] (f^a*x*Gamma[-1/3, -((b*Log[f])/x^3)]*(-((b*Log[f])/x^3))^(1/3))/3

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 97 vs. $2(26) = 52$.
time = 0.02, size = 98, normalized size = 3.06

method	result	size
meijerg	$-\frac{f^{a}(-b)^{\frac{1}{3}}\ln(f)^{\frac{1}{3}}\left(\frac{3\ln(f)^{\frac{2}{3}}b\Gamma\left(\frac{2}{3}\right)}{x^{2}(-b)^{\frac{1}{3}}\left(-\frac{b\ln(f)}{x^{3}}\right)^{\frac{2}{3}}}-\frac{3x\,\mathrm{e}^{\frac{b\ln(f)}{x^{3}}}}{(-b)^{\frac{1}{3}}\ln(f)^{\frac{1}{3}}}-\frac{3\ln(f)^{\frac{2}{3}}b\Gamma\left(\frac{2}{3},-\frac{b\ln(f)}{x^{3}}\right)}{x^{2}(-b)^{\frac{1}{3}}\left(-\frac{b\ln(f)}{x^{3}}\right)^{\frac{2}{3}}}\right)}{3}$	98

Verification of antiderivative is not currently implemented for this CAS.

[In] int(f^(a+b/x^3),x,method=_RETURNVERBOSE)

[Out] -1/3*f^a*(-b)^(1/3)*ln(f)^(1/3)*(3/x^2/(-b)^(1/3)*ln(f)^(2/3)*b*GAMMA(2/3)/(-b*ln(f)/x^3)^(2/3)-3*x/(-b)^(1/3)/ln(f)^(1/3)*exp(b*ln(f)/x^3)-3/x^2/(-b)^(1/3)*ln(f)^(2/3)*b/(-b*ln(f)/x^3)^(2/3)*GAMMA(2/3,-b*ln(f)/x^3))

Maxima [A]
time = 0.05, size = 26, normalized size = 0.81

$$\frac{1}{3}f^{a}x\left(-\frac{b\log(f)}{x^{3}}\right)^{\frac{1}{3}}\Gamma\left(-\frac{1}{3},-\frac{b\log(f)}{x^{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(a+b/x^3),x, algorithm="maxima")

[Out] 1/3*f^a*x*(-b*log(f)/x^3)^(1/3)*gamma(-1/3, -b*log(f)/x^3)

Fricas [A]
time = 0.09, size = 38, normalized size = 1.19

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

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(a+b/x^3),x, algorithm="fricas")

[Out] -(-b*log(f))^(1/3)*f^a*gamma(2/3, -b*log(f)/x^3) + f^((a*x^3 + b)/x^3)*x

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

$$\int f^{a+\frac{b}{x^{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3),x)
```

```
[Out] Integral(f**(a + b/x**3), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3),x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3), x)
```

Mupad [**B**]
time = 3.59, size = 48, normalized size = 1.50

$$f^a\,x\,\left(f^{\frac{b}{x^3}}+\Gamma\left(\frac{2}{3}\right)\,{\left(-\frac{b\,\ln\left(f\right)}{x^3}\right)}^{1/3}-\Gamma\left(\frac{2}{3},-\frac{b\,\ln\left(f\right)}{x^3}\right)\,{\left(-\frac{b\,\ln\left(f\right)}{x^3}\right)}^{1/3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3),x)
```

```
[Out] f^a*x*(f^(b/x^3) + gamma(2/3)*(-(b*log(f))/x^3)^(1/3) - igamma(2/3, -(b*log
(f))/x^3)*(-(b*log(f))/x^3)^(1/3))
```

3.171 $\int \frac{f^{a+\frac{b}{x^3}}}{x^2}\,dx$

Optimal. Leaf size=34

$$\frac{f^a\Gamma\left(\frac{1}{3},-\frac{b\log(f)}{x^3}\right)}{3x\sqrt[3]{-\frac{b\log(f)}{x^3}}}$$

```
[Out] 1/3*f^a*GAMMA(1/3,-b*ln(f)/x^3)/x/(-b*ln(f)/x^3)^(1/3)
```

Rubi [A]
time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$\frac{f^a\text{Gamma}\left(\frac{1}{3},-\frac{b\log(f)}{x^3}\right)}{3x\sqrt[3]{-\frac{b\log(f)}{x^3}}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)/x^2,x]
```

```
[Out] (f^a*Gamma[1/3, -((b*Log[f])/x^3)])/(3*x*(-((b*Log[f])/x^3))^(1/3))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^2}\,dx = \frac{f^a\Gamma\left(\frac{1}{3},-\frac{b\log(f)}{x^3}\right)}{3x\sqrt[3]{-\frac{b\log(f)}{x^3}}}$$

Mathematica [A]
time = 0.00, size = 34, normalized size = 1.00

$$\frac{f^a\Gamma\left(\frac{1}{3},-\frac{b\log(f)}{x^3}\right)}{3x\sqrt[3]{-\frac{b\log(f)}{x^3}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)/x^2,x]
```

```
[Out] (f^a*Gamma[1/3, -((b*Log[f])/x^3)])/(3*x*(-((b*Log[f])/x^3))^(1/3))
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 81 vs. $2(28) = 56$.

time = 0.02, size = 82, normalized size = 2.41

method	result	size
meijerg	$-\frac{f^{a}\left(\frac{2(-b)^{\frac{1}{3}}\ln(f)^{\frac{1}{3}}\pi\sqrt{3}}{3x\Gamma\left(\frac{2}{3}\right)\left(-\frac{b\ln(f)}{x^{3}}\right)^{\frac{1}{3}}}-\frac{(-b)^{\frac{1}{3}}\ln(f)^{\frac{1}{3}}\Gamma\left(\frac{1}{3},-\frac{b\ln(f)}{x^{3}}\right)}{x\left(-\frac{b\ln(f)}{x^{3}}\right)^{\frac{1}{3}}}\right)}{3(-b)^{\frac{1}{3}}\ln(f)^{\frac{1}{3}}}$	82

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*f^a/(-b)^(1/3)/ln(f)^(1/3)*(2/3/x*(-b)^(1/3)*ln(f)^(1/3)*Pi*3^(1/2)/GA
MMA(2/3)/(-b*ln(f)/x^3)^(1/3)-1/x*(-b)^(1/3)*ln(f)^(1/3)/(-b*ln(f)/x^3)^(1/
3)*GAMMA(1/3,-b*ln(f)/x^3))
```

Maxima [A]

time = 0.06, size = 28, normalized size = 0.82

$$\frac{f^{a}\Gamma\left(\frac{1}{3},-\frac{b\log(f)}{x^{3}}\right)}{3\,x\left(-\frac{b\log(f)}{x^{3}}\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^2,x, algorithm="maxima")
```

```
[Out] 1/3*f^a*gamma(1/3, -b*log(f)/x^3)/(x*(-b*log(f)/x^3)^(1/3))
```

Fricas [A]

time = 0.09, size = 29, normalized size = 0.85

$$-\frac{\left(-b\log\left(f\right)\right)^{\frac{2}{3}}f^{a}\Gamma\left(\frac{1}{3},-\frac{b\log(f)}{x^{3}}\right)}{3\,b\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^2,x, algorithm="fricas")
```

```
[Out] -1/3*(-b*log(f))^(2/3)*f^a*gamma(1/3, -b*log(f)/x^3)/(b*log(f))
```

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

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)/x**2,x)
```

```
[Out] Integral(f**(a + b/x**3)/x**2, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^2,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)/x^2, x)
```

Mupad [B]
time = 3.58, size = 46, normalized size = 1.35

$$-\frac{2\,\pi\,\sqrt{3}\,f^a-3\,f^a\,\Gamma\left(\frac{2}{3}\right)\,\Gamma\left(\frac{1}{3},-\frac{b\,\ln(f)}{x^3}\right)}{9\,x\,\Gamma\left(\frac{2}{3}\right)\,{\left(-\frac{b\,\ln(f)}{x^3}\right)}^{1/3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)/x^2,x)
```

```
[Out] -(2*3^(1/2)*f^a*pi - 3*f^a*gamma(2/3)*igamma(1/3, -(b*log(f))/x^3))/(9*x*ga
mma(2/3)*(-(b*log(f))/x^3)^(1/3))
```

3.172 $\int \frac{f^{a+\frac{b}{x^3}}}{x^3}\,dx$

Optimal. Leaf size=34

$$\frac{f^a\Gamma\left(\frac{2}{3},-\frac{b\log(f)}{x^3}\right)}{3x^2\left(-\frac{b\log(f)}{x^3}\right)^{2/3}}$$

```
[Out] 1/3*f^a*GAMMA(2/3,-b*ln(f)/x^3)/x^2/(-b*ln(f)/x^3)^(2/3)
```

Rubi [A]
time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$\frac{f^a\text{Gamma}\left(\frac{2}{3},-\frac{b\log(f)}{x^3}\right)}{3x^2\left(-\frac{b\log(f)}{x^3}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)/x^3,x]
[Out] (f^a*Gamma[2/3, -((b*Log[f])/x^3)])/(3*x^2*(-((b*Log[f])/x^3))^(2/3))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^3}\,dx=\frac{f^a\Gamma\left(\frac{2}{3},-\frac{b\log(f)}{x^3}\right)}{3x^2\left(-\frac{b\log(f)}{x^3}\right)^{2/3}}$$

Mathematica [A]
time = 0.00, size = 34, normalized size = 1.00

$$\frac{f^a\Gamma\left(\frac{2}{3},-\frac{b\log(f)}{x^3}\right)}{3x^2\left(-\frac{b\log(f)}{x^3}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)/x^3,x]
```

```
[Out] (f^a*Gamma[2/3, -((b*Log[f])/x^3)])/(3*x^2*(-((b*Log[f])/x^3))^(2/3))
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 77 vs. $2(28) = 56$.
time = 0.03, size = 78, normalized size = 2.29

method	result	size
meijerg	$\frac{f^{a}(-b)^{\frac{1}{3}}\left(\frac{(-b)^{\frac{2}{3}}\ln(f)^{\frac{2}{3}}\Gamma\left(\frac{2}{3}\right)}{x^{2}\left(-\frac{b\ln(f)}{x^{3}}\right)^{\frac{2}{3}}}-\frac{(-b)^{\frac{2}{3}}\ln(f)^{\frac{2}{3}}\Gamma\left(\frac{2}{3},-\frac{b\ln(f)}{x^{3}}\right)}{x^{2}\left(-\frac{b\ln(f)}{x^{3}}\right)^{\frac{2}{3}}}\right)}{3b\ln(f)^{\frac{2}{3}}}$	78

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*f^a/b/ln(f)^(2/3)*(-b)^(1/3)*(1/x^2*(-b)^(2/3)*ln(f)^(2/3)*GAMMA(2/3)/(
-b*ln(f)/x^3)^(2/3)-1/x^2*(-b)^(2/3)*ln(f)^(2/3)/(-b*ln(f)/x^3)^(2/3)*GAMMA
(2/3,-b*ln(f)/x^3))
```

Maxima [A]
time = 0.06, size = 28, normalized size = 0.82

$$\frac{f^{a}\Gamma\left(\frac{2}{3},-\frac{b\log(f)}{x^{3}}\right)}{3\,x^{2}\left(-\frac{b\log(f)}{x^{3}}\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^3,x, algorithm="maxima")
```

```
[Out] 1/3*f^a*gamma(2/3, -b*log(f)/x^3)/(x^2*(-b*log(f)/x^3)^(2/3))
```

Fricas [A]
time = 0.08, size = 29, normalized size = 0.85

$$-\frac{\left(-b\log\left(f\right)\right)^{\frac{1}{3}}f^{a}\Gamma\left(\frac{2}{3},-\frac{b\log(f)}{x^{3}}\right)}{3\,b\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^3,x, algorithm="fricas")
```

```
[Out] -1/3*(-b*log(f))^(1/3)*f^a*gamma(2/3, -b*log(f)/x^3)/(b*log(f))
```

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

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)/x**3,x)
```

```
[Out] Integral(f**(a + b/x**3)/x**3, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^3,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)/x^3, x)
```

Mupad [B]
time = 3.56, size = 33, normalized size = 0.97

$$-\frac{f^a\left(\Gamma\left(\frac{2}{3}\right)-\Gamma\left(\frac{2}{3},-\frac{b\,\ln(f)}{x^3}\right)\right)}{3\,x^2\left(-\frac{b\,\ln(f)}{x^3}\right)^{2/3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)/x^3,x)
```

```
[Out] -(f^a*(gamma(2/3) - igamma(2/3, -(b*log(f))/x^3)))/(3*x^2*(-(b*log(f))/x^3)
^(2/3))
```

3.173 $\int \frac{f^{a+\frac{b}{x^3}}}{x^5} dx$

Optimal. Leaf size=34

$$\frac{f^a \Gamma\left(\frac{4}{3}, -\frac{b \log(f)}{x^3}\right)}{3x^4 \left(-\frac{b \log(f)}{x^3}\right)^{4/3}}$$

[Out] 1/3*f^a*GAMMA(4/3,-b*ln(f)/x^3)/x^4/(-b*ln(f)/x^3)^(4/3)

Rubi [A]
time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$\frac{f^a \text{Gamma}\left(\frac{4}{3}, -\frac{b \log(f)}{x^3}\right)}{3x^4 \left(-\frac{b \log(f)}{x^3}\right)^{4/3}}$$

Antiderivative was successfully verified.

[In] Int[f^(a + b/x^3)/x^5,x]

[Out] (f^a*Gamma[4/3, -((b*Log[f])/x^3)])/(3*x^4*(-((b*Log[f])/x^3))^(4/3))

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^5} dx = \frac{f^a \Gamma\left(\frac{4}{3}, -\frac{b \log(f)}{x^3}\right)}{3x^4 \left(-\frac{b \log(f)}{x^3}\right)^{4/3}}$$

Mathematica [A]
time = 0.01, size = 34, normalized size = 1.00

$$\frac{f^a \Gamma\left(\frac{4}{3}, -\frac{b \log(f)}{x^3}\right)}{3x^4 \left(-\frac{b \log(f)}{x^3}\right)^{4/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)/x^5,x]
```

```
[Out] (f^a*Gamma[4/3, -((b*Log[f])/x^3)])/(3*x^4*(-((b*Log[f])/x^3))^(4/3))
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 111 vs. $2(28) = 56$.
time = 0.03, size = 112, normalized size = 3.29

method	result	size
meijerg	$-\frac{f^{a}\left(-\frac{2(-b)^{\frac{4}{3}}\ln(f)^{\frac{1}{3}}\pi\sqrt{3}}{9xb\Gamma\left(\frac{2}{3}\right)\left(-\frac{b\ln(f)}{x^{3}}\right)^{\frac{1}{3}}}+\frac{(-b)^{\frac{4}{3}}\ln(f)^{\frac{1}{3}}\mathrm{e}^{\frac{b\ln(f)}{x^{3}}}}{xb}+\frac{(-b)^{\frac{4}{3}}\ln(f)^{\frac{1}{3}}\Gamma\left(\frac{1}{3},-\frac{b\ln(f)}{x^{3}}\right)}{3xb\left(-\frac{b\ln(f)}{x^{3}}\right)^{\frac{1}{3}}}\right)}{3(-b)^{\frac{4}{3}}\ln(f)^{\frac{4}{3}}}$	112

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)/x^5,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*f^a/(-b)^(4/3)/ln(f)^(4/3)*(-2/9/x*(-b)^(4/3)*ln(f)^(1/3)/b*Pi*3^(1/2)
/GAMMA(2/3)/(-b*ln(f)/x^3)^(1/3)+1/x*(-b)^(4/3)*ln(f)^(1/3)/b*exp(b*ln(f)/x
^3)+1/3/x*(-b)^(4/3)*ln(f)^(1/3)/b/(-b*ln(f)/x^3)^(1/3)*GAMMA(1/3,-b*ln(f)/
x^3))
```

Maxima [A]
time = 0.06, size = 28, normalized size = 0.82

$$\frac{f^{a}\Gamma\left(\frac{4}{3}, -\frac{b\log(f)}{x^{3}}\right)}{3\,x^{4}\left(-\frac{b\log(f)}{x^{3}}\right)^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^5,x, algorithm="maxima")
```

```
[Out] 1/3*f^a*gamma(4/3, -b*log(f)/x^3)/(x^4*(-b*log(f)/x^3)^(4/3))
```

Fricas [A]
time = 0.11, size = 53, normalized size = 1.56

$$\frac{\left(-b\log\left(f\right)\right)^{\frac{2}{3}}f^{a}x\Gamma\left(\frac{1}{3}, -\frac{b\log(f)}{x^{3}}\right) - 3\,bf^{\frac{ax^{3}+b}{x^{3}}}\log\left(f\right)}{9\,b^{2}x\log\left(f\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^5,x, algorithm="fricas")
```

```
[Out] 1/9*((-b*log(f))^(2/3)*f^a*x*gamma(1/3, -b*log(f)/x^3) - 3*b*f^((a*x^3 + b)
/x^3)*log(f))/(b^2*x*log(f)^2)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)/x**5,x)
```

```
[Out] Timed out
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^5,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)/x^5, x)
```

Mupad [B]
time = 3.54, size = 77, normalized size = 2.26

$$\frac{f^a\,\Gamma\left(\frac{1}{3},-\frac{b\,\ln(f)}{x^3}\right)}{9\,x^4\,\left(-\frac{b\,\ln(f)}{x^3}\right)^{4/3}}-\frac{f^a\,f^{\frac{b}{x^3}}}{3\,b\,x\,\ln\left(f\right)}-\frac{2\,\pi\,\sqrt{3}\,f^a}{27\,x^4\,\Gamma\left(\frac{2}{3}\right)\,\left(-\frac{b\,\ln(f)}{x^3}\right)^{4/3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)/x^5,x)
```

```
[Out] (f^a*igamma(1/3, -(b*log(f))/x^3))/(9*x^4*(-(b*log(f))/x^3)^(4/3)) - (f^a*f
^(b/x^3))/(3*b*x*log(f)) - (2*3^(1/2)*f^a*pi)/(27*x^4*gamma(2/3)*(-(b*log(f
))/x^3)^(4/3))
```

3.174 $\int f^{a+bx^n} x^m \, dx$

Optimal. Leaf size=46

$$-\frac{f^a x^{1+m} \Gamma\left(\frac{1+m}{n}, -bx^n \log(f)\right) \left(-bx^n \log(f)\right)^{-\frac{1+m}{n}}}{n}$$

```
[Out] -f^a*x^(1+m)*GAMMA((1+m)/n,-b*x^n*ln(f))/n/((-b*x^n*ln(f))^((1+m)/n))
```

Rubi [A]
time = 0.02, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$-\frac{f^a x^{m+1} (-b \log(f) x^n)^{-\frac{m+1}{n}} \text{Gamma}\left(\frac{m+1}{n}, -b \log(f) x^n\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)*x^m,x]
```

```
[Out] -((f^a*x^(1 + m)*Gamma[(1 + m)/n, -(b*x^n*Log[f])])/(n*(-(b*x^n*Log[f]))^((
1 + m)/n)))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^n} x^m \, dx = -\frac{f^a x^{1+m} \Gamma\left(\frac{1+m}{n}, -bx^n \log(f)\right) \left(-bx^n \log(f)\right)^{-\frac{1+m}{n}}}{n}$$

Mathematica [A]
time = 0.01, size = 46, normalized size = 1.00

$$-\frac{f^a x^{1+m} \Gamma\left(\frac{1+m}{n}, -bx^n \log(f)\right) \left(-bx^n \log(f)\right)^{-\frac{1+m}{n}}}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x^m,x]
```

```
[Out] -((f^a*x^(1 + m)*Gamma[(1 + m)/n, -(b*x^n*Log[f])])/(n*(-(b*x^n*Log[f]))^((
1 + m)/n)))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.04, size = 280, normalized size = 6.09

method	result
meijerg	$\frac{f^{a}(-b)^{-\frac{m}{n}-\frac{1}{n}}\ln(f)^{-\frac{m}{n}-\frac{1}{n}}\left(\frac{n\,x^{1+m}(-b)^{\frac{m}{n}+\frac{1}{n}}\ln(f)^{\frac{m}{n}+\frac{1}{n}}(\ln(f)x^{n}bn+m+n+1)L_{-\frac{1+m}{n}}^{\left(\frac{1+m+n}{n}\right)}(b\,x^{n}\ln(f))\Gamma\left(-\frac{1+m}{n}+1\right)\Gamma\left(\frac{1+m+n}{n}+1\right)}{(1+m)(1+m+n)\Gamma\left(-\frac{1+m}{n}+\frac{1+m+n}{n}+1\right)}-\frac{n^{2}x}{}\right.}{n}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b*x^n)*x^m,x,method=_RETURNVERBOSE)
```

```
[Out] f^a*(-b)^(-m/n-1/n)*ln(f)^(-m/n-1/n)/n*(n/(1+m)*x^(1+m)*(-b)^(m/n+1/n)*ln(f
)^(m/n+1/n)*(ln(f)*x^n*b*n+m+n+1)/(1+m+n)*LaguerreL(-(1+m)/n,(1+m+n)/n,b*x^
n*ln(f))*GAMMA(-(1+m)/n+1)*GAMMA((1+m+n)/n+1)/GAMMA(-(1+m)/n+(1+m+n)/n+1)-n
^2/(1+m)*x^(1+m+n)*(-b)^(m/n+1/n)*ln(f)^(1+m/n+1/n)*b/(1+m+n)*LaguerreL(-(1
+m)/n,(1+m+n)/n+1,b*x^n*ln(f))*GAMMA(-(1+m)/n+1)*GAMMA((1+m+n)/n+1)/GAMMA(-
(1+m)/n+(1+m+n)/n+1))
```

Maxima [A]
time = 0.07, size = 47, normalized size = 1.02

$$-\frac{f^{a}x^{m+1}\Gamma\left(\frac{m+1}{n},-bx^{n}\log\left(f\right)\right)}{\left(-bx^{n}\log\left(f\right)\right)^{\frac{m+1}{n}}\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^m,x, algorithm="maxima")
```

```
[Out] -f^a*x^(m + 1)*gamma((m + 1)/n, -b*x^n*log(f))/((-b*x^n*log(f))^((m + 1)/n)
*n)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^m,x, algorithm="fricas")
```

```
[Out] integral(f^(b*x^n + a)*x^m, x)
```

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

$$\begin{cases} f^{a+b}\log(x) & \text{for}\: m=-1 \wedge n=0 \\ \int \frac{f^{a+bx^n}}{x}\,dx & \text{for}\: m=-1 \\ \int f^{a+bx^{-m-1}}x^m\,dx & \text{for}\: n=-m-1 \\ -\frac{bf^a f^{bx^n} n x x^m x^n \log(f)}{m^2+mn+2m+n+1} + \frac{f^a f^{bx^n} m x x^m}{m^2+mn+2m+n+1} + \frac{f^a f^{bx^n} n x x^m}{m^2+mn+2m+n+1} + \frac{f^a f^{bx^n} x x^m}{m^2+mn+2m+n+1} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**m,x)
```

```
[Out] Piecewise((f**(a + b)*log(x), Eq(m, -1) & Eq(n, 0)), (Integral(f**(a + b*x*
*n)/x, x), Eq(m, -1)), (Integral(f**(a + b*x**(-m - 1))*x**m, x), Eq(n, -m
- 1)), (-b*f**a*f**(b*x**n)*n*x*x**m*x**n*log(f)/(m**2 + m*n + 2*m + n + 1)
 + f**a*f**(b*x**n)*m*x*x**m/(m**2 + m*n + 2*m + n + 1) + f**a*f**(b*x**n)*
n*x*x**m/(m**2 + m*n + 2*m + n + 1) + f**a*f**(b*x**n)*x*x**m/(m**2 + m*n +
 2*m + n + 1), True))
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^m,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^n + a)*x^m, x)
```

Mupad [B]
time = 3.76, size = 79, normalized size = 1.72

$$\frac{f^a\,f^{b\,x^n}\,x^{m+1}\,\mathrm{e}^{-\frac{b\,x^n\,\ln(f)}{2}}\,\mathrm{M}_{1-\frac{m+n+1}{2\,n},\frac{m+n+1}{2\,n}-\frac{1}{2}}\left(b\,x^n\,\ln(f)\right)}{(m+1)\,\left(b\,x^n\,\ln(f)\right)^{\frac{m+n+1}{2\,n}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)*x^m,x)
```

```
[Out] (f^a*f^(b*x^n)*x^(m + 1)*exp(-(b*x^n*log(f))/2)*whittakerM(1 - (m + n + 1)/
(2*n), (m + n + 1)/(2*n) - 1/2, b*x^n*log(f)))/((m + 1)*(b*x^n*log(f))^((m
+ n + 1)/(2*n)))
```

3.175 $\int f^{a+bx^n} x^3 \, dx$

Optimal. Leaf size=39

$$-\frac{f^a x^4 \Gamma\left(\frac{4}{n}, -b x^n \log(f)\right) \left(-b x^n \log(f)\right)^{-4/n}}{n}$$

```
[Out] -f^a*x^4*GAMMA(4/n,-b*x^n*ln(f))/n/((-b*x^n*ln(f))^(4/n))
```

Rubi [A]
time = 0.02, antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$-\frac{x^4 f^a (-b \log(f) x^n)^{-4/n} \operatorname{Gamma}\left(\frac{4}{n}, -b \log(f) x^n\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)*x^3,x]
```

```
[Out] -((f^a*x^4*Gamma[4/n, -(b*x^n*Log[f])])/(n*(-(b*x^n*Log[f]))^(4/n)))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^n} x^3 \, dx = -\frac{f^a x^4 \Gamma\left(\frac{4}{n}, -b x^n \log(f)\right) \left(-b x^n \log(f)\right)^{-4/n}}{n}$$

Mathematica [A]
time = 0.01, size = 39, normalized size = 1.00

$$-\frac{f^a x^4 \Gamma\left(\frac{4}{n}, -b x^n \log(f)\right) \left(-b x^n \log(f)\right)^{-4/n}}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x^3,x]
```

```
[Out] -((f^a*x^4*Gamma[4/n, -(b*x^n*Log[f])])/(n*(-(b*x^n*Log[f]))^(4/n)))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.03, size = 212, normalized size = 5.44

method	result
meijerg	$\frac{f^{a}(-b)^{-\frac{4}{n}}\ln(f)^{-\frac{4}{n}}\left(\frac{n\,x^{4}(-b)^{\frac{4}{n}}\ln(f)^{\frac{4}{n}}(\ln(f)x^{n}bn+n+4)\Gamma\left(1-\frac{4}{n}\right)\Gamma\left(\frac{n+4}{n}+1\right)L_{-\frac{4}{n}}^{\left(\frac{n+4}{n}\right)}(b\,x^{n}\ln(f))}{4(n+4)\Gamma\left(-\frac{4}{n}+\frac{n+4}{n}+1\right)}-\frac{n^{2}x^{n+4}(-b)^{\frac{4}{n}}\ln(f)^{1+\frac{4}{n}}bL_{-\frac{4}{n}}^{\left(\frac{n+4}{n}+1\right)}}{4(n+4)\Gamma\left(-\frac{4}{n}+\right.}\right.}{n}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b*x^n)*x^3,x,method=_RETURNVERBOSE)
```

```
[Out] f^a*(-b)^(-4/n)*ln(f)^(-4/n)/n*(1/4*n*x^4*(-b)^(4/n)*ln(f)^(4/n)*(ln(f)*x^n
*b*n+n+4)/(n+4)/GAMMA(-4/n+(n+4)/n+1)*GAMMA(1-4/n)*GAMMA((n+4)/n+1)*Laguerr
eL(-4/n,(n+4)/n,b*x^n*ln(f))-1/4*n^2*x^(n+4)*(-b)^(4/n)*ln(f)^(1+4/n)*b/(n+
4)*LaguerreL(-4/n,(n+4)/n+1,b*x^n*ln(f))*GAMMA(1-4/n)*GAMMA((n+4)/n+1)/GAMM
A(-4/n+(n+4)/n+1))
```

Maxima [A]
time = 0.07, size = 41, normalized size = 1.05

$$-\frac{f^{a}x^{4}\Gamma\left(\frac{4}{n},-bx^{n}\log\left(f\right)\right)}{\left(-bx^{n}\log\left(f\right)\right)^{\frac{4}{n}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^3,x, algorithm="maxima")
```

```
[Out] -f^a*x^4*gamma(4/n, -b*x^n*log(f))/((-b*x^n*log(f))^(4/n)*n)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^3,x, algorithm="fricas")
```

```
[Out] integral(f^(b*x^n + a)*x^3, x)
```

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

$$\begin{cases} -\frac{bf^{a}f^{bx^{n}}nx^{4}x^{n}\log\left(f\right)}{4n+16}+\frac{f^{a}f^{bx^{n}}nx^{4}}{4n+16}+\frac{4f^{a}f^{bx^{n}}x^{4}}{4n+16} & \text{for}\: n\neq -4 \\ \int f^{a+\frac{b}{x^{4}}}x^{3}\,dx & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**3,x)
```

```
[Out] Piecewise((-b*f**a*f**(b*x**n)*n*x**4*x**n*log(f)/(4*n + 16) + f**a*f**(b*x
**n)*n*x**4/(4*n + 16) + 4*f**a*f**(b*x**n)*x**4/(4*n + 16), Ne(n, -4)), (I
ntegral(f**(a + b/x**4)*x**3, x), True))
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^3,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^n + a)*x^3, x)
```

Mupad [B]
time = 3.61, size = 54, normalized size = 1.38

$$\frac{f^a\,x^4\,\mathrm{e}^{\frac{b\,x^n\,\ln(f)}{2}}\,\mathrm{M}_{\frac{1}{2}-\frac{2}{n},\frac{2}{n}}\left(b\,x^n\,\ln\left(f\right)\right)}{4\,{\left(b\,x^n\,\ln\left(f\right)\right)}^{\frac{2}{n}+\frac{1}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)*x^3,x)
```

```
[Out] (f^a*x^4*exp((b*x^n*log(f))/2)*whittakerM(1/2 - 2/n, 2/n, b*x^n*log(f)))/(4
*(b*x^n*log(f))^(2/n + 1/2))
```

3.176 $\int f^{a+bx^n} x^2 \, dx$

Optimal. Leaf size=39

$$-\frac{f^a x^3 \Gamma\left(\frac{3}{n}, -bx^n \log(f)\right) \left(-bx^n \log(f)\right)^{-3/n}}{n}$$

[Out] -f^a*x^3*GAMMA(3/n,-b*x^n*ln(f))/n/((-b*x^n*ln(f))^(3/n))

Rubi [A]
time = 0.02, antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$-\frac{x^3 f^a (-b \log(f) x^n)^{-3/n} \operatorname{Gamma}\left(\frac{3}{n}, -b \log(f) x^n\right)}{n}$$

Antiderivative was successfully verified.

[In] Int[f^(a + b*x^n)*x^2,x]

[Out] -((f^a*x^3*Gamma[3/n, -(b*x^n*Log[f])])/(n*(-(b*x^n*Log[f]))^(3/n)))

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^n} x^2 \, dx = -\frac{f^a x^3 \Gamma\left(\frac{3}{n}, -bx^n \log(f)\right) \left(-bx^n \log(f)\right)^{-3/n}}{n}$$

Mathematica [A]
time = 0.01, size = 39, normalized size = 1.00

$$-\frac{f^a x^3 \Gamma\left(\frac{3}{n}, -bx^n \log(f)\right) \left(-bx^n \log(f)\right)^{-3/n}}{n}$$

Antiderivative was successfully verified.

[In] Integrate[f^(a + b*x^n)*x^2,x]

```
[Out] -((f^a*x^3*Gamma[3/n, -(b*x^n*Log[f])])/(n*(-(b*x^n*Log[f]))^(3/n)))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.04, size = 212, normalized size = 5.44

method	result
meijerg	$\frac{f^{a}(-b)^{-\frac{3}{n}} \ln(f)^{-\frac{3}{n}} \left(\frac{n\,x^{3}(-b)^{\frac{3}{n}} \ln(f)^{\frac{3}{n}} (\ln(f)x^{n}bn+n+3)\Gamma\left(1-\frac{3}{n}\right)\Gamma\left(\frac{3+n}{n}+1\right)L_{-\frac{3}{n}}^{\left(\frac{3+n}{n}\right)}(b\,x^{n}\ln(f))}{3(3+n)\Gamma\left(-\frac{3}{n}+\frac{3+n}{n}+1\right)}-\frac{n^{2}x^{3+n}(-b)^{\frac{3}{n}} \ln(f)^{1+\frac{3}{n}} bL_{-\frac{3}{n}}^{\left(\frac{3+n}{n}+1\right)}(b}{3(3+n)\Gamma\left(-\frac{3}{n}+\frac{3+}{n}\right.}\right.}{n}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b*x^n)*x^2,x,method=_RETURNVERBOSE)
```

```
[Out] f^a*(-b)^(-3/n)*ln(f)^(-3/n)/n*(1/3*n*x^3*(-b)^(3/n)*ln(f)^(3/n)*(ln(f)*x^n
*b*n+n+3)/(3+n)/GAMMA(-3/n+(3+n)/n+1)*GAMMA(1-3/n)*GAMMA((3+n)/n+1)*Laguerr
eL(-3/n,(3+n)/n,b*x^n*ln(f))-1/3*n^2*x^(3+n)*(-b)^(3/n)*ln(f)^(1+3/n)*b/(3+
n)*LaguerreL(-3/n,(3+n)/n+1,b*x^n*ln(f))*GAMMA(1-3/n)*GAMMA((3+n)/n+1)/GAMM
A(-3/n+(3+n)/n+1))
```

Maxima [A]
time = 0.07, size = 41, normalized size = 1.05

$$-\frac{f^{a}x^{3}\Gamma\left(\frac{3}{n}, -bx^{n}\log\left(f\right)\right)}{\left(-bx^{n}\log\left(f\right)\right)^{\frac{3}{n}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^2,x, algorithm="maxima")
```

```
[Out] -f^a*x^3*gamma(3/n, -b*x^n*log(f))/((-b*x^n*log(f))^(3/n)*n)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^2,x, algorithm="fricas")
```

```
[Out] integral(f^(b*x^n + a)*x^2, x)
```

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

$$\begin{cases} -\frac{bf^{a}f^{bx^{n}}nx^{3}x^{n}\log\left(f\right)}{3n+9} + \frac{f^{a}f^{bx^{n}}nx^{3}}{3n+9} + \frac{3f^{a}f^{bx^{n}}x^{3}}{3n+9} & \text{for}\: n \neq -3 \\ \int f^{a+\frac{b}{x^{3}}}x^{2}\, dx & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**2,x)
```

```
[Out] Piecewise((-b*f**a*f**(b*x**n)*n*x**3*x**n*log(f)/(3*n + 9) + f**a*f**(b*x*
*n)*n*x**3/(3*n + 9) + 3*f**a*f**(b*x**n)*x**3/(3*n + 9), Ne(n, -3)), (Inte
gral(f**(a + b/x**3)*x**2, x), True))
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^2,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^n + a)*x^2, x)
```

Mupad [B]
time = 3.51, size = 54, normalized size = 1.38

$$\frac{f^a\,x^3\,\mathrm{e}^{\frac{b\,x^n\,\ln(f)}{2}}\,\mathrm{M}_{\frac{1}{2}-\frac{3}{2\,n},\frac{3}{2\,n}}\left(b\,x^n\,\ln\left(f\right)\right)}{3\,{\left(b\,x^n\,\ln\left(f\right)\right)}^{\frac{3}{2\,n}+\frac{1}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)*x^2,x)
```

```
[Out] (f^a*x^3*exp((b*x^n*log(f))/2)*whittakerM(1/2 - 3/(2*n), 3/(2*n), b*x^n*log
(f)))/(3*(b*x^n*log(f))^(3/(2*n) + 1/2))
```

3.177 $\int f^{a+bx^n} x \, dx$

Optimal. Leaf size=39

$$-\frac{f^a x^2 \Gamma\left(\frac{2}{n}, -bx^n \log(f)\right) \left(-bx^n \log(f)\right)^{-2/n}}{n}$$

```
[Out] -f^a*x^2*GAMMA(2/n,-b*x^n*ln(f))/n/((-b*x^n*ln(f))^(2/n))
```

Rubi [A]
time = 0.01, antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2250}

$$-\frac{x^2 f^a (-b \log(f) x^n)^{-2/n} \operatorname{Gamma}\left(\frac{2}{n}, -b \log(f) x^n\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)*x,x]
```

```
[Out] -((f^a*x^2*Gamma[2/n, -(b*x^n*Log[f])])/(n*(-(b*x^n*Log[f]))^(2/n)))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^n} x \, dx = -\frac{f^a x^2 \Gamma\left(\frac{2}{n}, -bx^n \log(f)\right) \left(-bx^n \log(f)\right)^{-2/n}}{n}$$

Mathematica [A]
time = 0.01, size = 39, normalized size = 1.00

$$-\frac{f^a x^2 \Gamma\left(\frac{2}{n}, -bx^n \log(f)\right) \left(-bx^n \log(f)\right)^{-2/n}}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x,x]
```

```
[Out] -((f^a*x^2*Gamma[2/n, -(b*x^n*Log[f])])/(n*(-(b*x^n*Log[f]))^(2/n)))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.03, size = 212, normalized size = 5.44

method	result
meijerg	$\frac{f^a(-b)^{-\frac{2}{n}}\ln(f)^{-\frac{2}{n}}\left(\frac{n\,x^2(-b)^{\frac{2}{n}}\ln(f)^{\frac{2}{n}}(\ln(f)x^n bn+n+2)\Gamma\left(1-\frac{2}{n}\right)\Gamma\left(\frac{2+n}{n}+1\right)L_{-\frac{2}{n}}^{\left(\frac{2+n}{n}\right)}(b\,x^n\ln(f))}{2(2+n)\Gamma\left(-\frac{2}{n}+\frac{2+n}{n}+1\right)}-\frac{n^2x^{2+n}(-b)^{\frac{2}{n}}\ln(f)^{1+\frac{2}{n}}bL_{-\frac{2}{n}}^{\left(\frac{2+n}{n}+1\right)}(\cdots}{2(2+n)\Gamma\left(-\frac{2}{n}+\cdots\right.}\right.}{n}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b*x^n)*x,x,method=_RETURNVERBOSE)
```

```
[Out] f^a*(-b)^(-2/n)*ln(f)^(-2/n)/n*(1/2*n*x^2*(-b)^(2/n)*ln(f)^(2/n)*(ln(f)*x^n
*b*n+n+2)/(2+n)/GAMMA(-2/n+(2+n)/n+1)*GAMMA(1-2/n)*GAMMA((2+n)/n+1)*Laguerr
eL(-2/n,(2+n)/n,b*x^n*ln(f))-1/2*n^2*x^(2+n)*(-b)^(2/n)*ln(f)^(1+2/n)*b/(2+
n)*LaguerreL(-2/n,(2+n)/n+1,b*x^n*ln(f))*GAMMA(1-2/n)*GAMMA((2+n)/n+1)/GAMM
A(-2/n+(2+n)/n+1))
```

Maxima [A]
time = 0.07, size = 41, normalized size = 1.05

$$-\frac{f^a x^2\Gamma\left(\frac{2}{n},-bx^n\log(f)\right)}{(-bx^n\log(f))^{\frac{2}{n}}\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x,x, algorithm="maxima")
```

```
[Out] -f^a*x^2*gamma(2/n, -b*x^n*log(f))/((-b*x^n*log(f))^(2/n)*n)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x,x, algorithm="fricas")
```

```
[Out] integral(f^(b*x^n + a)*x, x)
```

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

$$\begin{cases} -\frac{bf^a f^{bx^n} nx^2x^n\log(f)}{2n+4}+\frac{f^a f^{bx^n} nx^2}{2n+4}+\frac{2f^a f^{bx^n} x^2}{2n+4} & \text{for } n\neq -2\\ \int f^{a+\frac{b}{x^2}}x\,dx & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x,x)
```

```
[Out] Piecewise((-b*f**a*f**(b*x**n)*n*x**2*x**n*log(f)/(2*n + 4) + f**a*f**(b*x*
*n)*n*x**2/(2*n + 4) + 2*f**a*f**(b*x**n)*x**2/(2*n + 4), Ne(n, -2)), (Inte
gral(f**(a + b/x**2)*x, x), True))
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^n + a)*x, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.03

$$\int f^{a+b\,x^n}\,x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)*x,x)
```

```
[Out] int(f^(a + b*x^n)*x, x)
```

3.178 $\int f^{a+bx^n}\,dx$

Optimal. Leaf size=35

$$-\frac{f^a x\Gamma\left(\frac{1}{n},-bx^n\log(f)\right)\left(-bx^n\log(f)\right)^{-1/n}}{n}$$

```
[Out] -f^a*x*GAMMA(1/n,-b*x^n*ln(f))/n/((-b*x^n*ln(f))^(1/n))
```

Rubi [A]
time = 0.00, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2239}

$$-\frac{x f^a(-b\log(f)x^n)^{-1/n}\,\text{Gamma}\left(\frac{1}{n},-b\log(f)x^n\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n),x]
[Out] -((f^a*x*Gamma[n^(-1), -(b*x^n*Log[f])])/(n*(-(b*x^n*Log[f]))^n^(-1)))
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rubi steps

$$\int f^{a+bx^n}\,dx = -\frac{f^a x\Gamma\left(\frac{1}{n},-bx^n\log(f)\right)\left(-bx^n\log(f)\right)^{-1/n}}{n}$$

Mathematica [A]
time = 0.01, size = 35, normalized size = 1.00

$$-\frac{f^a x\Gamma\left(\frac{1}{n},-bx^n\log(f)\right)\left(-bx^n\log(f)\right)^{-1/n}}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n),x]
[Out] -((f^a*x*Gamma[n^(-1), -(b*x^n*Log[f])])/(n*(-(b*x^n*Log[f]))^n^(-1)))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.03, size = 201, normalized size = 5.74

method	result
meijerg	$\frac{f^{a}(-b)^{-\frac{1}{n}}\ln(f)^{-\frac{1}{n}}\left(\frac{nx(-b)^{\frac{1}{n}}\ln(f)^{\frac{1}{n}}(\ln(f)x^{n}bn+n+1)\Gamma\left(1-\frac{1}{n}\right)\Gamma\left(\frac{1+n}{n}+1\right)L_{-\frac{1}{n}}^{\left(\frac{1+n}{n}\right)}(b\,x^{n}\ln(f))}{(1+n)\Gamma\left(-\frac{1}{n}+\frac{1+n}{n}+1\right)}-\frac{n^{2}x^{1+n}(-b)^{\frac{1}{n}}\ln(f)^{1+\frac{1}{n}}bL_{-\frac{1}{n}}^{\left(\frac{1+n}{n}+1\right)}(b\,x^{n}}{(1+n)\Gamma\left(-\frac{1}{n}+\frac{1+n}{n}\right.}\right.}{n}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b*x^n),x,method=_RETURNVERBOSE)
```

```
[Out] f^a/n*(-b)^(-1/n)*ln(f)^(-1/n)*(n*x*(-b)^(1/n)*ln(f)^(1/n)*(ln(f)*x^n*b*n+n
+1)/(1+n)/GAMMA(-1/n+(1+n)/n+1)*GAMMA(1-1/n)*GAMMA((1+n)/n+1)*LaguerreL(-1/
n,(1+n)/n,b*x^n*ln(f))-n^2*x^(1+n)*(-b)^(1/n)*ln(f)^(1+1/n)*b/(1+n)*Laguerr
eL(-1/n,(1+n)/n+1,b*x^n*ln(f))*GAMMA(1-1/n)*GAMMA((1+n)/n+1)/GAMMA(-1/n+(1+
n)/n+1))
```

Maxima [A]
time = 0.07, size = 35, normalized size = 1.00

$$-\frac{f^{a}x\Gamma\left(\frac{1}{n},-bx^{n}\log\left(f\right)\right)}{\left(-bx^{n}\log\left(f\right)\right)^{\left(\frac{1}{n}\right)}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n),x, algorithm="maxima")
```

```
[Out] -f^a*x*gamma(1/n, -b*x^n*log(f))/((-b*x^n*log(f))^(1/n)*n)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n),x, algorithm="fricas")
```

```
[Out] integral(f^(b*x^n + a), x)
```

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

$$\begin{cases} -\frac{bf^{a}f^{bx^{n}}nxx^{n}\log\left(f\right)}{n+1}+\frac{f^{a}f^{bx^{n}}nx}{n+1}+\frac{f^{a}f^{bx^{n}}x}{n+1} & \text{for}\ n\neq -1 \\ \int f^{a+\frac{b}{x}}\,dx & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n),x)
```

```
[Out] Piecewise((-b*f**a*f**(b*x**n)*n*x*x**n*log(f)/(n + 1) + f**a*f**(b*x**n)*n
*x/(n + 1) + f**a*f**(b*x**n)*x/(n + 1), Ne(n, -1)), (Integral(f**(a + b/x)
, x), True))
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n),x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^n + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.03

$$\int f^{a+b\,x^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n),x)
```

```
[Out] int(f^(a + b*x^n), x)
```

3.179 $\int \frac{f^{a+bx^n}}{x}\,dx$

Optimal. Leaf size=15

$$\frac{f^a\text{Ei}(bx^n\log(f))}{n}$$

```
[Out] f^a*Ei(b*x^n*ln(f))/n
```

Rubi [A]
time = 0.02, antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2241}

$$\frac{f^a\text{Ei}(bx^n\log(f))}{n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)/x,x]
```

```
[Out] (f^a*ExpIntegralEi[b*x^n*Log[f]])/n
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^n}}{x}\,dx = \frac{f^a\text{Ei}(bx^n\log(f))}{n}$$

Mathematica [A]
time = 0.00, size = 15, normalized size = 1.00

$$\frac{f^a\text{Ei}(bx^n\log(f))}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)/x,x]
```

```
[Out] (f^a*ExpIntegralEi[b*x^n*Log[f]])/n
```

Maple [A]
time = 0.06, size = 19, normalized size = 1.27

method	result	size
risch	$-\frac{f^{a} \operatorname{expIntegral}(1,-b\,x^{n} \ln(f))}{n}$	19
meijerg	$\frac{f^{a}(-\ln(-b\,x^{n} \ln(f))-\operatorname{expIntegral}(1,-b\,x^{n} \ln(f))+n\ln(x)+\ln(-b)+\ln(\ln(f)))}{n}$	43

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b*x^n)/x,x,method=_RETURNVERBOSE)
```

```
[Out] -1/n*f^a*Ei(1,-b*x^n*ln(f))
```

Maxima [A]
time = 0.32, size = 15, normalized size = 1.00

$$\frac{f^{a}\text{Ei}(bx^{n}\log{(f)})}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x,x, algorithm="maxima")
```

```
[Out] f^a*Ei(b*x^n*log(f))/n
```

Fricas [A]
time = 0.37, size = 15, normalized size = 1.00

$$\frac{f^{a}\text{Ei}(bx^{n}\log{(f)})}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x,x, algorithm="fricas")
```

```
[Out] f^a*Ei(b*x^n*log(f))/n
```

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

$$\int \frac{f^{a+bx^{n}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)/x,x)
```

```
[Out] Integral(f**(a + b*x**n)/x, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^n + a)/x, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.07

$$\int \frac{f^{a+b\,x^n}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)/x,x)
```

```
[Out] int(f^(a + b*x^n)/x, x)
```

3.180 $\int \frac{f^{a+bx^n}}{x^2} \, dx$

Optimal. Leaf size=37

$$-\frac{f^a\Gamma\left(-\frac{1}{n},-bx^n\log(f)\right)\left(-bx^n\log(f)\right)^{\frac{1}{n}}}{nx}$$

```
[Out] -f^a*GAMMA(-1/n,-b*x^n*ln(f))*(-b*x^n*ln(f))^(1/n)/n/x
```

Rubi [A]
time = 0.02, antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2250}

$$-\frac{f^a(-b\log(f)x^n)^{\frac{1}{n}}\text{ Gamma}\left(-\frac{1}{n},-b\log(f)x^n\right)}{nx}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)/x^2,x]
```

```
[Out] -((f^a*Gamma[-n^(-1), -(b*x^n*Log[f])]*(-(b*x^n*Log[f]))^n^(-1))/(n*x))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^n}}{x^2} \, dx = -\frac{f^a\Gamma\left(-\frac{1}{n},-bx^n\log(f)\right)\left(-bx^n\log(f)\right)^{\frac{1}{n}}}{nx}$$

Mathematica [A]
time = 0.00, size = 37, normalized size = 1.00

$$-\frac{f^a\Gamma\left(-\frac{1}{n},-bx^n\log(f)\right)\left(-bx^n\log(f)\right)^{\frac{1}{n}}}{nx}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)/x^2,x]
```

```
[Out] -((f^a*Gamma[-n^(-1), -(b*x^n*Log[f])]*(-(b*x^n*Log[f]))^n^(-1))/(n*x))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.03, size = 195, normalized size = 5.27

method	result
meijerg	$\frac{f^{a}(-b)^{\frac{1}{n}}\ln(f)^{\frac{1}{n}}\left(-\frac{n(-b)^{-\frac{1}{n}}\ln(f)^{-\frac{1}{n}}(\ln(f)x^{n}bn+n-1)\Gamma\left(1+\frac{1}{n}\right)\Gamma\left(\frac{-1+n}{n}+1\right)L_{\frac{1}{n}}^{\left(\frac{-1+n}{n}\right)}(b\,x^{n}\ln(f))}{x(-1+n)\Gamma\left(\frac{1}{n}+\frac{-1+n}{n}+1\right)}+\frac{n^{2}x^{-1+n}(-b)^{-\frac{1}{n}}\ln(f)^{1-\frac{1}{n}}bL_{\frac{1}{n}}^{\left(\frac{-1+n}{n}\right.}}{(-1+n)\Gamma\left(\frac{1}{n}\right.}}{n}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b*x^n)/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] f^a*(-b)^(1/n)*ln(f)^(1/n)/n*(-n/x*(-b)^(-1/n)*ln(f)^(-1/n)*(ln(f)*x^n*b*n+
n-1)/(-1+n)/GAMMA(1/n+(-1+n)/n+1)*GAMMA(1+1/n)*GAMMA((-1+n)/n+1)*LaguerreL(
1/n,(-1+n)/n,b*x^n*ln(f))+n^2*x^(-1+n)*(-b)^(-1/n)*ln(f)^(1-1/n)*b/(-1+n)*L
aguerreL(1/n,(-1+n)/n+1,b*x^n*ln(f))*GAMMA(1+1/n)*GAMMA((-1+n)/n+1)/GAMMA(1
/n+(-1+n)/n+1))
```

Maxima [A]
time = 0.06, size = 37, normalized size = 1.00

$$-\frac{\left(-bx^{n}\log\left(f\right)\right)^{\left(\frac{1}{n}\right)}f^{a}\Gamma\left(-\frac{1}{n},-bx^{n}\log\left(f\right)\right)}{nx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x^2,x, algorithm="maxima")
```

```
[Out] -(-b*x^n*log(f))^(1/n)*f^a*gamma(-1/n, -b*x^n*log(f))/(n*x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x^2,x, algorithm="fricas")
```

```
[Out] integral(f^(b*x^n + a)/x^2, x)
```

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

$$\begin{cases} \frac{bf^{a}f^{bx^{n}}nx^{n}\log\left(f\right)}{nx-x}-\frac{f^{a}f^{bx^{n}}n}{nx-x}+\frac{f^{a}f^{bx^{n}}}{nx-x} & \text{for}\ n\neq 1 \\ \int\frac{f^{a+bx}}{x^{2}}\,dx & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)/x**2,x)
```

```
[Out] Piecewise((b*f**a*f**(b*x**n)*n*x**n*log(f)/(n*x - x) - f**a*f**(b*x**n)*n/
(n*x - x) + f**a*f**(b*x**n)/(n*x - x), Ne(n, 1)), (Integral(f**(a + b*x)/x
**2, x), True))
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x^2,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^n + a)/x^2, x)
```

Mupad [B]
time = 3.53, size = 52, normalized size = 1.41

$$-\frac{f^a\,\mathrm{e}^{\frac{b\,x^n\,\ln(f)}{2}}\,\mathrm{M}_{\frac{1}{2\,n}+\frac{1}{2},-\frac{1}{2\,n}}\left(b\,x^n\,\ln\left(f\right)\right)\,{\left(b\,x^n\,\ln\left(f\right)\right)}^{\frac{1}{2\,n}-\frac{1}{2}}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)/x^2,x)
```

```
[Out] -(f^a*exp((b*x^n*log(f))/2)*whittakerM(1/(2*n) + 1/2, -1/(2*n), b*x^n*log(f
))*(b*x^n*log(f))^(1/(2*n) - 1/2))/x
```

3.181 $\int \frac{f^{a+bx^n}}{x^3}\,dx$

Optimal. Leaf size=39

$$-\frac{f^a\Gamma\left(-\frac{2}{n},-bx^n\log(f)\right)\left(-bx^n\log(f)\right)^{2/n}}{nx^2}$$

```
[Out] -f^a*GAMMA(-2/n,-b*x^n*ln(f))*(-b*x^n*ln(f))^(2/n)/n/x^2
```

Rubi [A]
time = 0.02, antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$-\frac{f^a\left(-b\log(f)x^n\right)^{2/n}\text{Gamma}\left(-\frac{2}{n},-b\log(f)x^n\right)}{nx^2}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)/x^3,x]
```

```
[Out] -((f^a*Gamma[-2/n, -(b*x^n*Log[f])]*(-(b*x^n*Log[f]))^(2/n))/(n*x^2))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^n}}{x^3}\,dx = -\frac{f^a\Gamma\left(-\frac{2}{n},-bx^n\log(f)\right)\left(-bx^n\log(f)\right)^{2/n}}{nx^2}$$

Mathematica [A]
time = 0.00, size = 39, normalized size = 1.00

$$-\frac{f^a\Gamma\left(-\frac{2}{n},-bx^n\log(f)\right)\left(-bx^n\log(f)\right)^{2/n}}{nx^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)/x^3,x]
```

[Out] -((f^a*Gamma[-2/n, -(b*x^n*Log[f])]*(-(b*x^n*Log[f]))^(2/n))/(n*x^2))

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.02, size = 212, normalized size = 5.44

method	result
meijerg	$\frac{f^{a}(-b)^{\frac{2}{n}}\ln(f)^{\frac{2}{n}}\left(-\frac{n(-b)^{-\frac{2}{n}}\ln(f)^{-\frac{2}{n}}(\ln(f)x^{n}bn+n-2)\Gamma\left(1+\frac{2}{n}\right)\Gamma\left(\frac{-2+n}{n}+1\right)L_{\frac{2}{n}}^{\left(\frac{-2+n}{n}\right)}(b\,x^{n}\ln(f))}{2x^{2}(-2+n)\Gamma\left(\frac{2}{n}+\frac{-2+n}{n}+1\right)}+\frac{n^{2}x^{-2+n}(-b)^{-\frac{2}{n}}\ln(f)^{1-\frac{2}{n}}bL_{\frac{2}{n}}^{\left(\frac{-2}{n}\right.}}{2(-2+n)\Gamma(}\right.}{n}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(f^(a+b*x^n)/x^3,x,method=_RETURNVERBOSE)

[Out] f^a*(-b)^(2/n)*ln(f)^(2/n)/n*(-1/2*n/x^2*(-b)^(-2/n)*ln(f)^(-2/n)*(ln(f)*x^n*b*n+n-2)/(-2+n)/GAMMA(2/n+(-2+n)/n+1)*GAMMA(1+2/n)*GAMMA((-2+n)/n+1)*LaguerreL(2/n,(-2+n)/n,b*x^n*ln(f))+1/2*n^2*x^(-2+n)*(-b)^(-2/n)*ln(f)^(1-2/n)*b/(-2+n)*LaguerreL(2/n,(-2+n)/n+1,b*x^n*ln(f))*GAMMA(1+2/n)*GAMMA((-2+n)/n+1)/GAMMA(2/n+(-2+n)/n+1))

Maxima [A]
time = 0.07, size = 39, normalized size = 1.00

$$-\frac{(-bx^n\log(f))^{\frac{2}{n}}\,f^a\Gamma\left(-\frac{2}{n},-bx^n\log(f)\right)}{nx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(a+b*x^n)/x^3,x, algorithm="maxima")

[Out] -(-b*x^n*log(f))^(2/n)*f^a*gamma(-2/n, -b*x^n*log(f))/(n*x^2)

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(a+b*x^n)/x^3,x, algorithm="fricas")

[Out] integral(f^(b*x^n + a)/x^3, x)

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

$$\begin{cases} \frac{bf^af^{bx^n}nx^n\log(f)}{2nx^2-4x^2}-\frac{f^af^{bx^n}n}{2nx^2-4x^2}+\frac{2f^af^{bx^n}}{2nx^2-4x^2} & \text{for}\ n\neq 2\\ \int\frac{f^{a+bx^2}}{x^3}\,dx & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)/x**3,x)
```

```
[Out] Piecewise((b*f**a*f**(b*x**n)*n*x**n*log(f)/(2*n*x**2 - 4*x**2) - f**a*f**(
b*x**n)*n/(2*n*x**2 - 4*x**2) + 2*f**a*f**(b*x**n)/(2*n*x**2 - 4*x**2), Ne(
n, 2)), (Integral(f**(a + b*x**2)/x**3, x), True))
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x^3,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^n + a)/x^3, x)
```

Mupad [B]
time = 3.52, size = 48, normalized size = 1.23

$$-\frac{f^a\,\mathrm{e}^{\frac{b\,x^n\,\ln(f)}{2}}\,\mathrm{M}_{\frac{1}{n}+\frac{1}{2},-\frac{1}{n}}\left(b\,x^n\,\ln\left(f\right)\right)\,{\left(b\,x^n\,\ln\left(f\right)\right)}^{\frac{1}{n}-\frac{1}{2}}}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)/x^3,x)
```

```
[Out] -(f^a*exp((b*x^n*log(f))/2)*whittakerM(1/n + 1/2, -1/n, b*x^n*log(f))*(b*x^
n*log(f))^(1/n - 1/2))/(2*x^2)
```

3.182 $\int \frac{f^{a+bx^n}}{x^4} dx$

Optimal. Leaf size=39

$$-\frac{f^a\Gamma\left(-\frac{3}{n},-bx^n\log(f)\right)\left(-bx^n\log(f)\right)^{3/n}}{nx^3}$$

```
[Out] -f^a*GAMMA(-3/n,-b*x^n*ln(f))*(-b*x^n*ln(f))^(3/n)/n/x^3
```

Rubi [A]
time = 0.02, antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2250}

$$-\frac{f^a(-b\log(f)x^n)^{3/n}\operatorname{Gamma}\left(-\frac{3}{n},-b\log(f)x^n\right)}{nx^3}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)/x^4,x]
```

```
[Out] -((f^a*Gamma[-3/n, -(b*x^n*Log[f])]*(-(b*x^n*Log[f]))^(3/n))/(n*x^3))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^n}}{x^4} dx = -\frac{f^a\Gamma\left(-\frac{3}{n},-bx^n\log(f)\right)\left(-bx^n\log(f)\right)^{3/n}}{nx^3}$$

Mathematica [A]
time = 0.00, size = 39, normalized size = 1.00

$$-\frac{f^a\Gamma\left(-\frac{3}{n},-bx^n\log(f)\right)\left(-bx^n\log(f)\right)^{3/n}}{nx^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)/x^4,x]
```

```
[Out] -((f^a*Gamma[-3/n, -(b*x^n*Log[f])]*(-(b*x^n*Log[f]))^(3/n))/(n*x^3))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.02, size = 212, normalized size = 5.44

method	result
meijerg	$\frac{f^{a}(-b)^{\frac{3}{n}}\ln(f)^{\frac{3}{n}}\left(-\frac{n(-b)^{-\frac{3}{n}}\ln(f)^{-\frac{3}{n}}(\ln(f)x^{n}bn+n-3)\Gamma\left(1+\frac{3}{n}\right)\Gamma\left(\frac{n-3}{n}+1\right)L_{\frac{3}{n}}^{\left(\frac{n-3}{n}\right)}(b\,x^{n}\ln(f))}{3x^{3}(n-3)\Gamma\left(\frac{3}{n}+\frac{n-3}{n}+1\right)}+\frac{n^{2}x^{n-3}(-b)^{-\frac{3}{n}}\ln(f)^{1-\frac{3}{n}}bL_{\frac{3}{n}}^{\left(\frac{n-3}{n}+1\right)}(b}{3(n-3)\Gamma\left(\frac{3}{n}+\frac{n-}{n}\right.}\right.}{n}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b*x^n)/x^4,x,method=_RETURNVERBOSE)
```

```
[Out] f^a*(-b)^(3/n)*ln(f)^(3/n)/n*(-1/3*n/x^3*(-b)^(-3/n)*ln(f)^(-3/n)*(ln(f)*x^
n*b*n+n-3)/(n-3)/GAMMA(3/n+(n-3)/n+1)*GAMMA(1+3/n)*GAMMA((n-3)/n+1)*Laguerr
eL(3/n,(n-3)/n,b*x^n*ln(f))+1/3*n^2*x^(n-3)*(-b)^(-3/n)*ln(f)^(1-3/n)*b/(n-
3)*LaguerreL(3/n,(n-3)/n+1,b*x^n*ln(f))*GAMMA(1+3/n)*GAMMA((n-3)/n+1)/GAMMA
(3/n+(n-3)/n+1))
```

Maxima [A]
time = 0.06, size = 39, normalized size = 1.00

$$-\frac{(-bx^{n}\log(f))^{\frac{3}{n}}f^{a}\Gamma\left(-\frac{3}{n},-bx^{n}\log(f)\right)}{nx^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x^4,x, algorithm="maxima")
```

```
[Out] -(-b*x^n*log(f))^(3/n)*f^a*gamma(-3/n, -b*x^n*log(f))/(n*x^3)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x^4,x, algorithm="fricas")
```

```
[Out] integral(f^(b*x^n + a)/x^4, x)
```

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

$$\begin{cases} \frac{bf^{a}f^{bx^{n}}nx^{n}\log(f)}{3nx^{3}-9x^{3}} - \frac{f^{a}f^{bx^{n}}n}{3nx^{3}-9x^{3}} + \frac{3f^{a}f^{bx^{n}}}{3nx^{3}-9x^{3}} & \text{for}\ n \neq 3 \\ \int \frac{f^{a+bx^{3}}}{x^{4}}\,dx & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)/x**4,x)
```

```
[Out] Piecewise((b*f**a*f**(b*x**n)*n*x**n*log(f)/(3*n*x**3 - 9*x**3) - f**a*f**(
b*x**n)*n/(3*n*x**3 - 9*x**3) + 3*f**a*f**(b*x**n)/(3*n*x**3 - 9*x**3), Ne(
n, 3)), (Integral(f**(a + b*x**3)/x**4, x), True))
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x^4,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^n + a)/x^4, x)
```

Mupad [B]
time = 3.48, size = 52, normalized size = 1.33

$$-\frac{f^a\,\mathrm{e}^{\frac{b\,x^n\,\ln(f)}{2}}\,\mathrm{M}_{\frac{3}{2\,n}+\frac{1}{2},-\frac{3}{2\,n}}\left(b\,x^n\,\ln\left(f\right)\right)\,{\left(b\,x^n\,\ln\left(f\right)\right)}^{\frac{3}{2\,n}-\frac{1}{2}}}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)/x^4,x)
```

```
[Out] -(f^a*exp((b*x^n*log(f))/2)*whittakerM(3/(2*n) + 1/2, -3/(2*n), b*x^n*log(f
))*(b*x^n*log(f))^(3/(2*n) - 1/2))/(3*x^3)
```

3.183 $\int f^{a+bx^n} x^{-1+3n} \, dx$

Optimal. Leaf size=71

$$\frac{2f^{a+bx^n}}{b^3 n \log^3(f)} - \frac{2f^{a+bx^n} x^n}{b^2 n \log^2(f)} + \frac{f^{a+bx^n} x^{2n}}{bn \log(f)}$$

```
[Out] 2*f^(a+b*x^n)/b^3/n/ln(f)^3-2*f^(a+b*x^n)*x^n/b^2/n/ln(f)^2+f^(a+b*x^n)*x^(
2*n)/b/n/ln(f)
```

Rubi [A]
time = 0.05, antiderivative size = 71, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$, Rules used = {2244, 2240}

$$\frac{2f^{a+bx^n}}{b^3 n \log^3(f)} - \frac{2x^n f^{a+bx^n}}{b^2 n \log^2(f)} + \frac{x^{2n} f^{a+bx^n}}{bn \log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)*x^(-1 + 3*n),x]
```

```
[Out] (2*f^(a + b*x^n))/(b^3*n*Log[f]^3) - (2*f^(a + b*x^n)*x^n)/(b^2*n*Log[f]^2)
 + (f^(a + b*x^n)*x^(2*n))/(b*n*Log[f])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2244

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^Simplify[m - n]*
F^(a + b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && Integer
Q[2*Simplify[(m + 1)/n]] && LtQ[0, Simplify[(m + 1)/n], 5] &&  !RationalQ[m
] && SumSimplerQ[m, -n]
```

Rubi steps

$$\int f^{a+bx^n}x^{-1+3n}\,dx = \frac{f^{a+bx^n}x^{2n}}{bn\log(f)} - \frac{2\int f^{a+bx^n}x^{-1+2n}\,dx}{b\log(f)}$$
$$= -\frac{2f^{a+bx^n}x^n}{b^2n\log^2(f)} + \frac{f^{a+bx^n}x^{2n}}{bn\log(f)} + \frac{2\int f^{a+bx^n}x^{-1+n}\,dx}{b^2\log^2(f)}$$
$$= \frac{2f^{a+bx^n}}{b^3n\log^3(f)} - \frac{2f^{a+bx^n}x^n}{b^2n\log^2(f)} + \frac{f^{a+bx^n}x^{2n}}{bn\log(f)}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.00, size = 24, normalized size = 0.34

$$\frac{f^a\Gamma(3,-bx^n\log(f))}{b^3n\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x^(-1 + 3*n),x]
[Out] (f^a*Gamma[3, -(b*x^n*Log[f])])/(b^3*n*Log[f]^3)
```

Maple [A]
time = 0.02, size = 44, normalized size = 0.62

method	result	size
risch	$\frac{\left(b^2x^{2n}\ln(f)^2-2b\,x^n\ln(f)+2\right)f^{a+b\,x^n}}{b^3\ln(f)^3n}$	44
meijerg	$-\frac{f^a\left(2-\frac{\left(3b^2x^{2n}\ln(f)^2-6b\,x^n\ln(f)+6\right)e^{b\,x^n\ln(f)}}{3}\right)}{\ln(f)^3b^3n}$	52

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b*x^n)*x^(-1+3*n),x,method=_RETURNVERBOSE)
[Out] (b^2*(x^n)^2*ln(f)^2-2*b*x^n*ln(f)+2)/b^3/ln(f)^3/n*f^(a+b*x^n)
```

Maxima [A]
time = 0.28, size = 51, normalized size = 0.72

$$\frac{\left(b^2f^ax^{2\,n}\log\left(f\right)^2-2\,bf^ax^n\log\left(f\right)+2\,f^a\right)f^{bx^n}}{b^3n\log\left(f\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+3*n),x, algorithm="maxima")
```

```
[Out] (b^2*f^a*x^(2*n)*log(f)^2 - 2*b*f^a*x^n*log(f) + 2*f^a)*f^(b*x^n)/(b^3*n*lo
g(f)^3)
```

Fricas [A]
time = 0.37, size = 47, normalized size = 0.66

$$\frac{\left(b^2 x^{2\,n} \log\left(f\right)^2 - 2\,b x^n \log\left(f\right) + 2\right) e^{\left(b x^n \log\left(f\right) + a \log\left(f\right)\right)}}{b^3 n \log\left(f\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+3*n),x, algorithm="fricas")
```

```
[Out] (b^2*x^(2*n)*log(f)^2 - 2*b*x^n*log(f) + 2)*e^(b*x^n*log(f) + a*log(f))/(b^
3*n*log(f)^3)
```

Sympy [A]
time = 73.66, size = 49, normalized size = 0.69

$$\begin{cases} -\frac{b f^a f^{b x^n} x^{4n} \log\left(f\right)}{12n} + \frac{f^a f^{b x^n} x^{3n}}{3n} & \text{for}\ n \neq 0 \\ f^{a+b} \log\left(x\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**(-1+3*n),x)
```

```
[Out] Piecewise((-b*f**a*f**(b*x**n)*x**(4*n)*log(f)/(12*n) + f**a*f**(b*x**n)*x*
*(3*n)/(3*n), Ne(n, 0)), (f**(a + b)*log(x), True))
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+3*n),x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^n + a)*x^(3*n - 1), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int f^{a+b\,x^n}\,x^{3\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)*x^(3*n - 1),x)
```

```
[Out] int(f^(a + b*x^n)*x^(3*n - 1), x)
```

3.184 $\int f^{a+bx^n} x^{-1+2n}\, dx$

Optimal. Leaf size=45

$$-\frac{f^{a+bx^n}}{b^2 n \log^2(f)}+\frac{f^{a+bx^n} x^n}{b n \log(f)}$$

```
[Out] -f^(a+b*x^n)/b^2/n/ln(f)^2+f^(a+b*x^n)*x^n/b/n/ln(f)
```

Rubi [A]
time = 0.03, antiderivative size = 45, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2244, 2240}

$$\frac{x^n f^{a+bx^n}}{b n \log(f)}-\frac{f^{a+bx^n}}{b^2 n \log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)*x^(-1 + 2*n),x]
```

```
[Out] -(f^(a + b*x^n)/(b^2*n*Log[f]^2)) + (f^(a + b*x^n)*x^n)/(b*n*Log[f])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2244

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^Simplify[m - n]*
F^(a + b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && Integer
Q[2*Simplify[(m + 1)/n]] && LtQ[0, Simplify[(m + 1)/n], 5] &&  !RationalQ[m
] && SumSimplerQ[m, -n]
```

Rubi steps

$$\begin{aligned}\int f^{a+bx^n} x^{-1+2n}\, dx &= \frac{f^{a+bx^n} x^n}{b n \log(f)}-\frac{\int f^{a+bx^n} x^{-1+n}\, dx}{b \log(f)}\\ &= -\frac{f^{a+bx^n}}{b^2 n \log^2(f)}+\frac{f^{a+bx^n} x^n}{b n \log(f)}\end{aligned}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.00, size = 25, normalized size = 0.56

$$-\frac{f^a\Gamma(2,-bx^n\log(f))}{b^2n\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x^(-1 + 2*n),x]
[Out] -((f^a*Gamma[2, -(b*x^n*Log[f])])/(b^2*n*Log[f]^2))
```

Maple [A]
time = 0.04, size = 30, normalized size = 0.67

method	result	size
risch	$\frac{(b\,x^n\ln(f)-1)f^{a+b\,x^n}}{\ln(f)^2b^2n}$	30
meijerg	$\frac{f^a\left(1-\frac{(2-2b\,x^n\ln(f))e^{b\,x^n\ln(f)}}{2}\right)}{\ln(f)^2b^2n}$	37
norman	$\frac{e^{n\ln(x)}e^{\left(a+b\,e^{n\ln(x)}\right)\ln(f)}}{\ln(f)bn}-\frac{e^{\left(a+b\,e^{n\ln(x)}\right)\ln(f)}}{\ln(f)^2b^2n}$	56

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b*x^n)*x^(-1+2*n),x,method=_RETURNVERBOSE)
[Out] (b*x^n*ln(f)-1)/ln(f)^2/b^2/n*f^(a+b*x^n)
```

Maxima [A]
time = 0.28, size = 34, normalized size = 0.76

$$\frac{(bf^ax^n\log{(f)}-f^a)f^{bx^n}}{b^2n\log{(f)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+2*n),x, algorithm="maxima")
[Out] (b*f^a*x^n*log(f) - f^a)*f^(b*x^n)/(b^2*n*log(f)^2)
```

Fricas [A]
time = 0.52, size = 33, normalized size = 0.73

$$\frac{(bx^n\log{(f)}-1)e^{(bx^n\log(f)+a\log(f))}}{b^2n\log{(f)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+2*n),x, algorithm="fricas")
```

```
[Out] (b*x^n*log(f) - 1)*e^(b*x^n*log(f) + a*log(f))/(b^2*n*log(f)^2)
```

Sympy [A]
time = 104.09, size = 49, normalized size = 1.09

$$\begin{cases} -\frac{bf^a f^{bx^n} x^{3n} \log(f)}{6n} + \frac{f^a f^{bx^n} x^{2n}}{2n} & \text{for } n \neq 0 \\ f^{a+b} \log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**(-1+2*n),x)
```

```
[Out] Piecewise((-b*f**a*f**(b*x**n)*x**(3*n)*log(f)/(6*n) + f**a*f**(b*x**n)*x**
(2*n)/(2*n), Ne(n, 0)), (f**(a + b)*log(x), True))
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+2*n),x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^n + a)*x^(2*n - 1), x)
```

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

$$\int f^{a+b\,x^n}\,x^{2\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)*x^(2*n - 1),x)
```

```
[Out] int(f^(a + b*x^n)*x^(2*n - 1), x)
```

3.185 $\int f^{a+bx^n} x^{-1+n}\, dx$

Optimal. Leaf size=20

$$\frac{f^{a+bx^n}}{bn\log(f)}$$

[Out] f^(a+b*x^n)/b/n/ln(f)

Rubi [A]
time = 0.02, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$, Rules used = {2240}

$$\frac{f^{a+bx^n}}{bn\log(f)}$$

Antiderivative was successfully verified.

[In] Int[f^(a + b*x^n)*x^(-1 + n),x]

[Out] f^(a + b*x^n)/(b*n*Log[f])

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^n} x^{-1+n}\, dx = \frac{f^{a+bx^n}}{bn\log(f)}$$

Mathematica [A]
time = 0.00, size = 20, normalized size = 1.00

$$\frac{f^{a+bx^n}}{bn\log(f)}$$

Antiderivative was successfully verified.

[In] Integrate[f^(a + b*x^n)*x^(-1 + n),x]

[Out] f^(a + b*x^n)/(b*n*Log[f])

Maple [A]
time = 0.03, size = 21, normalized size = 1.05

method	result	size
risch	$\frac{f^{a+b\,x^{n}}}{bn\ln\left(f\right)}$	21
norman	$\frac{\mathrm{e}^{\left(a+b\,\mathrm{e}^{n\ln\left(x\right)}\right)\ln\left(f\right)}}{\ln\left(f\right)bn}$	25
meijerg	$-\frac{f^{a}\left(-\frac{\left(-1\right)^{-\frac{-1+n}{n}-\frac{1}{n}}}{\Gamma\left(2-\frac{-1+n}{n}-\frac{1}{n}\right)}+\frac{\left(-1\right)^{-\frac{-1+n}{n}-\frac{1}{n}}\mathrm{e}^{b\,x^{n}\ln\left(f\right)}}{\Gamma\left(2-\frac{-1+n}{n}-\frac{1}{n}\right)}\right)}{\ln\left(f\right)bn}$	96

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b*x^n)*x^(-1+n),x,method=_RETURNVERBOSE)
[Out] f^(a+b*x^n)/b/n/ln(f)
```

Maxima [A]
time = 0.29, size = 20, normalized size = 1.00

$$\frac{f^{bx^n+a}}{bn\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+n),x, algorithm="maxima")
[Out] f^(b*x^n + a)/(b*n*log(f))
```

Fricas [A]
time = 0.44, size = 24, normalized size = 1.20

$$\frac{e^{\left(bx^n\log\left(f\right)+a\log\left(f\right)\right)}}{bn\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+n),x, algorithm="fricas")
[Out] e^(b*x^n*log(f) + a*log(f))/(b*n*log(f))
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 39 vs. 2(14) = 28.
time = 19.91, size = 39, normalized size = 1.95

$$\begin{cases}\log\left(x\right) & \text{for}\: b=0\wedge f=1\wedge n=0\\ f^{a+b}\log\left(x\right) & \text{for}\: n=0\\ \frac{x^n}{n} & \text{for}\: f=1\\ \frac{f^a x^n}{n} & \text{for}\: b=0\\ \frac{f^a f^{bx^n}}{bn\log\left(f\right)} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**(-1+n),x)
```

```
[Out] Piecewise((log(x), Eq(b, 0) & Eq(f, 1) & Eq(n, 0)), (f**(a + b)*log(x), Eq(
n, 0)), (x**n/n, Eq(f, 1)), (f**a*x**n/n, Eq(b, 0)), (f**a*f**(b*x**n)/(b*n
*log(f)), True))
```

Giac [A]
time = 2.63, size = 20, normalized size = 1.00

$$\frac{f^{bx^n+a}}{bn\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+n),x, algorithm="giac")
```

```
[Out] f^(b*x^n + a)/(b*n*log(f))
```

Mupad [B]
time = 3.50, size = 20, normalized size = 1.00

$$\frac{f^{a+b\,x^n}}{b\,n\,\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)*x^(n - 1),x)
```

```
[Out] f^(a + b*x^n)/(b*n*log(f))
```

3.186 $\int \frac{f^{a+bx^n}}{x} dx$

Optimal. Leaf size=15

$$\frac{f^a \text{Ei}(bx^n \log(f))}{n}$$

[Out] f^a*Ei(b*x^n*ln(f))/n

Rubi [A]
time = 0.02, antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2241}

$$\frac{f^a \text{Ei}(bx^n \log(f))}{n}$$

Antiderivative was successfully verified.

[In] Int[f^(a + b*x^n)/x,x]

[Out] (f^a*ExpIntegralEi[b*x^n*Log[f]])/n

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^n}}{x} dx = \frac{f^a \text{Ei}(bx^n \log(f))}{n}$$

Mathematica [A]
time = 0.00, size = 15, normalized size = 1.00

$$\frac{f^a \text{Ei}(bx^n \log(f))}{n}$$

Antiderivative was successfully verified.

[In] Integrate[f^(a + b*x^n)/x,x]

[Out] (f^a*ExpIntegralEi[b*x^n*Log[f]])/n

Maple [A]
time = 0.00, size = 19, normalized size = 1.27

method	result	size
risch	$-\frac{f^{a} \operatorname{expIntegral}\left(1,-b\,x^{n} \ln \left(f\right)\right)}{n}$	19
meijerg	$\frac{f^{a} \left(-\ln \left(-b\,x^{n} \ln \left(f\right)\right)-\operatorname{expIntegral}\left(1,-b\,x^{n} \ln \left(f\right)\right)+n \ln \left(x\right)+\ln \left(-b\right)+\ln \left(\ln \left(f\right)\right)\right)}{n}$	43

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b*x^n)/x,x,method=_RETURNVERBOSE)
```

```
[Out] -1/n*f^a*Ei(1,-b*x^n*ln(f))
```

Maxima [A]
time = 0.33, size = 15, normalized size = 1.00

$$\frac{f^a \mathrm{Ei}(bx^n \log{(f)})}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x,x, algorithm="maxima")
```

```
[Out] f^a*Ei(b*x^n*log(f))/n
```

Fricas [A]
time = 0.65, size = 15, normalized size = 1.00

$$\frac{f^a \mathrm{Ei}(bx^n \log{(f)})}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x,x, algorithm="fricas")
```

```
[Out] f^a*Ei(b*x^n*log(f))/n
```

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

$$\int \frac{f^{a+bx^n}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)/x,x)
```

```
[Out] Integral(f**(a + b*x**n)/x, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^n + a)/x, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.07

$$\int \frac{f^{a+b\,x^n}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)/x,x)
```

```
[Out] int(f^(a + b*x^n)/x, x)
```

3.187 $\int f^{a+bx^n}x^{-1-n}\,dx$

Optimal. Leaf size=38

$$-\frac{f^{a+bx^n}x^{-n}}{n}+\frac{bf^a\text{Ei}(bx^n\log(f))\log(f)}{n}$$

```
[Out] -f^(a+b*x^n)/n/(x^n)+b*f^a*Ei(b*x^n*ln(f))*ln(f)/n
```

Rubi [A]
time = 0.03, antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2246, 2241}

$$\frac{bf^a\log(f)\text{Ei}(bx^n\log(f))}{n}-\frac{x^{-n}f^{a+bx^n}}{n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)*x^(-1 - n),x]
```

```
[Out] -(f^(a + b*x^n)/(n*x^n)) + (b*f^a*ExpIntegralEi[b*x^n*Log[f]]*Log[f])/n
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2246

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^Simplify[m + n]*F^(a + b*(c
 + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && IntegerQ[2*Simplif
y[(m + 1)/n]] && LtQ[-4, Simplify[(m + 1)/n], 5] &&  !RationalQ[m] && SumSi
mplerQ[m, n]
```

Rubi steps

$$\begin{aligned}\int f^{a+bx^n}x^{-1-n}\,dx&=-\frac{f^{a+bx^n}x^{-n}}{n}+(b\log(f))\int\frac{f^{a+bx^n}}{x}\,dx\\&=-\frac{f^{a+bx^n}x^{-n}}{n}+\frac{bf^a\text{Ei}(bx^n\log(f))\log(f)}{n}\end{aligned}$$

Mathematica [A]
time = 0.00, size = 20, normalized size = 0.53

$$\frac{bf^a\Gamma(-1,-bx^n\log(f))\log(f)}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x^(-1 - n),x]
[Out] (b*f^a*Gamma[-1, -(b*x^n*Log[f])]*Log[f])/n
```

Maple [A]
time = 0.07, size = 43, normalized size = 1.13

method	result
risch	$-\frac{f^{b\,x^n} f^a x^{-n}}{n}-\frac{\ln(f) b\, f^a\, \text{expIntegral}(1,-b\,x^n\ln(f))}{n}$
meijerg	$-\frac{f^a\ln(f) b\left(\frac{(-1)^{-\frac{-1-n}{n}-\frac{1}{n}} x^{-n}(2+2b\,x^n\ln(f))}{\Gamma\left(2-\frac{-1-n}{n}-\frac{1}{n}\right) b\ln(f)}-\frac{2(-1)^{-\frac{-1-n}{n}-\frac{1}{n}} x^{-n}\mathrm{e}^{b\,x^n\ln(f)}}{\Gamma\left(2-\frac{-1-n}{n}-\frac{1}{n}\right) b\ln(f)}+\frac{2(-1)^{-\frac{-1-n}{n}-\frac{1}{n}}(-\gamma-\ln(-b\,x^n\ln(f))-\text{expIntegral}(}{\Gamma\left(2-\frac{-1-n}{n}-\frac{1}{n}\right)}\right.}{n}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b*x^n)*x^(-1-n),x,method=_RETURNVERBOSE)
[Out] -1/n*f^(b*x^n)*f^a/(x^n)-1/n*ln(f)*b*f^a*Ei(1,-b*x^n*ln(f))
```

Maxima [A]
time = 0.32, size = 20, normalized size = 0.53

$$\frac{bf^a\Gamma(-1,-bx^n\log{(f)})\log{(f)}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1-n),x, algorithm="maxima")
[Out] b*f^a*gamma(-1, -b*x^n*log(f))*log(f)/n
```

Fricas [A]
time = 0.37, size = 43, normalized size = 1.13

$$\frac{bf^ax^n\mathrm{Ei}(bx^n\log{(f)})\log{(f)}-e^{(bx^n\log(f)+a\log(f))}}{nx^n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1-n),x, algorithm="fricas")
[Out] (b*f^a*x^n*Ei(b*x^n*log(f))*log(f) - e^(b*x^n*log(f) + a*log(f)))/(n*x^n)
```

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

$$\begin{cases} \int f^{a+\frac{b}{x}}\, dx & \text{for}\: n = -1 \\ f^{a+b} \log{(x)} & \text{for}\: n = 0 \\ \frac{bf^{a} f^{bx^{n}} n^{2} x^{n} \log{(f)} \log{(x)}}{n^{2} x^{n} + nx^{n}} - \frac{bf^{a} f^{bx^{n}} n^{2} x^{n} \log{(f)}}{n^{2} x^{n} + nx^{n}} + \frac{bf^{a} f^{bx^{n}} nx^{n} \log{(f)} \log{(x)}}{n^{2} x^{n} + nx^{n}} - \frac{f^{a} f^{bx^{n}} n}{n^{2} x^{n} + nx^{n}} - \frac{f^{a} f^{bx^{n}}}{n^{2} x^{n} + nx^{n}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**(-1-n),x)
```

```
[Out] Piecewise((Integral(f**(a + b/x), x), Eq(n, -1)), (f**(a + b)*log(x), Eq(n,
 0)), (b*f**a*f**(b*x**n)*n**2*x**n*log(f)*log(x)/(n**2*x**n + n*x**n) - b*
f**a*f**(b*x**n)*n**2*x**n*log(f)/(n**2*x**n + n*x**n) + b*f**a*f**(b*x**n)
*n*x**n*log(f)*log(x)/(n**2*x**n + n*x**n) - f**a*f**(b*x**n)*n/(n**2*x**n
+ n*x**n) - f**a*f**(b*x**n)/(n**2*x**n + n*x**n), True))
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1-n),x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^n + a)*x^(-n - 1), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{f^{a+b\,x^n}}{x^{n+1}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)/x^(n + 1),x)
```

```
[Out] int(f^(a + b*x^n)/x^(n + 1), x)
```

3.188 $\int f^{a+bx^n}x^{-1-2n}\,dx$

Optimal. Leaf size=71

$$-\frac{f^{a+bx^n}x^{-2n}}{2n}-\frac{bf^{a+bx^n}x^{-n}\log(f)}{2n}+\frac{b^2f^a\text{Ei}(bx^n\log(f))\log^2(f)}{2n}$$

```
[Out] -1/2*f^(a+b*x^n)/n/(x^(2*n))-1/2*b*f^(a+b*x^n)*ln(f)/n/(x^n)+1/2*b^2*f^a*Ei
(b*x^n*ln(f))*ln(f)^2/n
```

Rubi [A]
time = 0.05, antiderivative size = 71, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}=0.118$,
Rules used = {2246, 2241}

$$\frac{b^2f^a\log^2(f)\text{Ei}(bx^n\log(f))}{2n}-\frac{x^{-2n}f^{a+bx^n}}{2n}-\frac{b\log(f)x^{-n}f^{a+bx^n}}{2n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)*x^(-1 - 2*n),x]
```

```
[Out] -1/2*f^(a + b*x^n)/(n*x^(2*n)) - (b*f^(a + b*x^n)*Log[f])/(2*n*x^n) + (b^2*
f^a*ExpIntegralEi[b*x^n*Log[f]]*Log[f]^2)/(2*n)
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2246

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^Simplify[m + n]*F^(a + b*(c
 + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && IntegerQ[2*Simplif
y[(m + 1)/n]] && LtQ[-4, Simplify[(m + 1)/n], 5] &&  !RationalQ[m] && SumSi
mplerQ[m, n]
```

Rubi steps

$$\begin{aligned}\int f^{a+bx^n}x^{-1-2n}\,dx&=-\frac{f^{a+bx^n}x^{-2n}}{2n}+\frac{1}{2}(b\log(f))\int f^{a+bx^n}x^{-1-n}\,dx\\&=-\frac{f^{a+bx^n}x^{-2n}}{2n}-\frac{bf^{a+bx^n}x^{-n}\log(f)}{2n}+\frac{1}{2}\left(b^2\log^2(f)\right)\int\frac{f^{a+bx^n}}{x}\,dx\\&=-\frac{f^{a+bx^n}x^{-2n}}{2n}-\frac{bf^{a+bx^n}x^{-n}\log(f)}{2n}+\frac{b^2f^a\text{Ei}(bx^n\log(f))\log^2(f)}{2n}\end{aligned}$$

Mathematica [A]
time = 0.00, size = 25, normalized size = 0.35

$$-\frac{b^2 f^a \Gamma(-2,-b x^n \log(f)) \log^2(f)}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x^(-1 - 2*n),x]
```

```
[Out] -((b^2*f^a*Gamma[-2, -(b*x^n*Log[f])]*Log[f]^2)/n)
```

Maple [A]
time = 0.08, size = 70, normalized size = 0.99

method	result
risch	$-\frac{f^{b\,x^n} f^a x^{-2n}}{2n}-\frac{\ln(f) b\, f^{b\,x^n} f^a x^{-n}}{2n}-\frac{\ln(f)^2 b^2 f^a \,\mathrm{expIntegral}(1,-b\,x^n \ln(f))}{2n}$
meijerg	$f^a \ln(f)^2 b^2 \left(\frac{(-1)^{-\frac{-1-2n}{n}-\frac{1}{n}} x^{-2n}\left(9b^2 x^{2n}\ln(f)^2+12b\,x^n\ln(f)+6\right)}{2\Gamma\left(2-\frac{-1-2n}{n}-\frac{1}{n}\right) b^2 \ln(f)^2}-\frac{(-1)^{-\frac{-1-2n}{n}-\frac{1}{n}} x^{-2n}(3+3b\,x^n\ln(f))\mathrm{e}^{b\,x^n\ln(f)}}{\Gamma\left(2-\frac{-1-2n}{n}-\frac{1}{n}\right) b^2\ln(f)^2}+\frac{3(-1)^{-\frac{-1-2n}{n}-\frac{1}{n}}}{}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b*x^n)*x^(-1-2*n),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2/n*f^(b*x^n)*f^a/(x^n)^2-1/2/n*ln(f)*b*f^(b*x^n)*f^a/(x^n)-1/2/n*ln(f)^
2*b^2*f^a*Ei(1,-b*x^n*ln(f))
```

Maxima [A]
time = 0.33, size = 25, normalized size = 0.35

$$-\frac{b^2 f^a \Gamma(-2,-b x^n \log(f)) \log(f)^2}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1-2*n),x, algorithm="maxima")
```

```
[Out] -b^2*f^a*gamma(-2, -b*x^n*log(f))*log(f)^2/n
```

Fricas [A]
time = 0.41, size = 61, normalized size = 0.86

$$\frac{b^2 f^a x^{2n} \mathrm{Ei}(b x^n \log(f)) \log(f)^2-(b x^n \log(f)+1) e^{(b x^n \log(f)+a \log(f))}}{2\, n x^{2n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1-2*n),x, algorithm="fricas")
```

```
[Out] 1/2*(b^2*f^a*x^(2*n)*Ei(b*x^n*log(f))*log(f)^2 - (b*x^n*log(f) + 1)*e^(b*x^
n*log(f) + a*log(f)))/(n*x^(2*n))
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**(-1-2*n),x)
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1-2*n),x, algorithm="giac")
[Out] integrate(f^(b*x^n + a)*x^(-2*n - 1), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{f^{a+b\,x^n}}{x^{2\,n+1}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)/x^(2*n + 1),x)
[Out] int(f^(a + b*x^n)/x^(2*n + 1), x)
```

3.189 $\int f^{a+bx^n} x^{-1+\frac{5n}{2}}\,dx$

Optimal. Leaf size=104

$$\frac{3f^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x^{n/2}\sqrt{\log(f)}\right)}{4b^{5/2}n\log^{\frac{5}{2}}(f)}-\frac{3f^{a+bx^n}x^{n/2}}{2b^2n\log^2(f)}+\frac{f^{a+bx^n}x^{3n/2}}{bn\log(f)}$$

```
[Out] -3/2*f^(a+b*x^n)*x^(1/2*n)/b^2/n/ln(f)^2+f^(a+b*x^n)*x^(3/2*n)/b/n/ln(f)+3/
4*f^a*erfi(x^(1/2*n)*b^(1/2)*ln(f)^(1/2))*Pi^(1/2)/b^(5/2)/n/ln(f)^(5/2)
```

Rubi [A]
time = 0.08, antiderivative size = 104, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.158$, Rules used = {2244, 2242, 2235}

$$\frac{3\sqrt{\pi}\,f^a\mathrm{Erfi}\left(\sqrt{b}\,\sqrt{\log(f)}\,x^{n/2}\right)}{4b^{5/2}n\log^{\frac{5}{2}}(f)}-\frac{3x^{n/2}f^{a+bx^n}}{2b^2n\log^2(f)}+\frac{x^{3n/2}f^{a+bx^n}}{bn\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)*x^(-1 + (5*n)/2),x]
```

```
[Out] (3*f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x^(n/2)*Sqrt[Log[f]]])/(4*b^(5/2)*n*Log[f]^(5/
2)) - (3*f^(a + b*x^n)*x^(n/2))/(2*b^2*n*Log[f]^2) + (f^(a + b*x^n)*x^((3*n
)/2))/(b*n*Log[f])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2244

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^Simplify[m - n]*
F^(a + b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && Integer
Q[2*Simplify[(m + 1)/n]] && LtQ[0, Simplify[(m + 1)/n], 5] &&  !RationalQ[m
```

```
] && SumSimplerQ[m, -n]
```

Rubi steps

$$\begin{aligned}
\int f^{a+bx^n}x^{-1+\frac{5n}{2}}\,dx &= \frac{f^{a+bx^n}x^{3n/2}}{bn\log(f)}-\frac{3\int f^{a+bx^n}x^{-1+\frac{3n}{2}}\,dx}{2b\log(f)}\\
&= -\frac{3f^{a+bx^n}x^{n/2}}{2b^2n\log^2(f)}+\frac{f^{a+bx^n}x^{3n/2}}{bn\log(f)}+\frac{3\int f^{a+bx^n}x^{\frac{1}{2}(-2+n)}\,dx}{4b^2\log^2(f)}\\
&= -\frac{3f^{a+bx^n}x^{n/2}}{2b^2n\log^2(f)}+\frac{f^{a+bx^n}x^{3n/2}}{bn\log(f)}+\frac{3\mathrm{Subst}\left(\int f^{a+bx^2}\,dx,x,x^{1+\frac{1}{2}(-2+n)}\right)}{2b^2n\log^2(f)}\\
&= \frac{3f^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x^{n/2}\sqrt{\log(f)}\right)}{4b^{5/2}n\log^{\frac{5}{2}}(f)}-\frac{3f^{a+bx^n}x^{n/2}}{2b^2n\log^2(f)}+\frac{f^{a+bx^n}x^{3n/2}}{bn\log(f)}
\end{aligned}$$

Mathematica [A]
time = 0.01, size = 39, normalized size = 0.38

$$-\frac{f^ax^{5n/2}\Gamma\left(\frac{5}{2},-bx^n\log(f)\right)}{n\left(-bx^n\log(f)\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x^(-1 + (5*n)/2),x]
[Out] -((f^a*x^((5*n)/2)*Gamma[5/2, -(b*x^n*Log[f])])/(n*(-(b*x^n*Log[f]))^(5/2))
)
```

Maple [A]
time = 0.07, size = 82, normalized size = 0.79

method	result	size
meijerg	$\frac{f^a\left(-\frac{x^{\frac{n}{2}}(-b)^{\frac{5}{2}}\sqrt{\ln(f)}\,(-10b\,x^n\ln(f)+15)\mathrm{e}^{b\,x^n\ln(f)}}{10b^2}+\frac{3(-b)^{\frac{5}{2}}\sqrt{\pi}\,\mathrm{erfi}\left(x^{\frac{n}{2}}\sqrt{b}\,\sqrt{\ln(f)}\right)}{4b^{\frac{5}{2}}}\right)}{(-b)^{\frac{5}{2}}\ln(f)^{\frac{5}{2}}n}$	82
risch	$\frac{f^af^{b\,x^n}x^{\frac{3n}{2}}}{nb\ln(f)}-\frac{3f^ax^{\frac{n}{2}}f^{b\,x^n}}{2n\ln(f)^2b^2}+\frac{3f^a\sqrt{\pi}\,\mathrm{erf}\left(\sqrt{-b\ln(f)}\,x^{\frac{n}{2}}\right)}{4n\ln(f)^2b^2\sqrt{-b\ln(f)}}$	96

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b*x^n)*x^(-1+5/2*n),x,method=_RETURNVERBOSE)
```

```
[Out] f^a/(-b)^(5/2)/ln(f)^(5/2)/n*(-1/10*x^(1/2*n)*(-b)^(5/2)*ln(f)^(1/2)*(-10*b
*x^n*ln(f)+15)/b^2*exp(b*x^n*ln(f))+3/4*(-b)^(5/2)/b^(5/2)*Pi^(1/2)*erfi(x^
(1/2*n)*b^(1/2)*ln(f)^(1/2)))
```

Maxima [A]
time = 0.33, size = 33, normalized size = 0.32

$$-\frac{f^a x^{\frac{5}{2}n}\Gamma\left(\frac{5}{2}, -bx^n \log(f)\right)}{(-bx^n \log(f))^{\frac{5}{2}} n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+5/2*n),x, algorithm="maxima")
```

```
[Out] -f^a*x^(5/2*n)*gamma(5/2, -b*x^n*log(f))/((-b*x^n*log(f))^(5/2)*n)
```

Fricas [A]
time = 0.40, size = 82, normalized size = 0.79

$$-\frac{3\sqrt{\pi}\sqrt{-b\log(f)}f^a \operatorname{erf}\left(\sqrt{-b\log(f)}x^{\frac{1}{2}n}\right) - 2\left(2b^2x^{\frac{3}{2}n}\log(f)^2 - 3bx^{\frac{1}{2}n}\log(f)\right)e^{(bx^n\log(f)+a\log(f))}}{4b^3n\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+5/2*n),x, algorithm="fricas")
```

```
[Out] -1/4*(3*sqrt(pi)*sqrt(-b*log(f))*f^a*erf(sqrt(-b*log(f))*x^(1/2*n)) - 2*(2*
b^2*x^(3/2*n)*log(f)^2 - 3*b*x^(1/2*n)*log(f))*e^(b*x^n*log(f) + a*log(f)))
/(b^3*n*log(f)^3)
```

Sympy [A]
time = 72.97, size = 56, normalized size = 0.54

$$\begin{cases} -\frac{4bf^a f^{bx^n} x^{\frac{7n}{2}} \log(f)}{35n} + \frac{2f^a f^{bx^n} x^{\frac{5n}{2}}}{5n} & \text{for } n \neq 0 \\ f^{a+b} \log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**(-1+5/2*n),x)
```

```
[Out] Piecewise((-4*b*f**a*f**(b*x**n)*x**(7*n/2)*log(f)/(35*n) + 2*f**a*f**(b*x*
*n)*x**(5*n/2)/(5*n), Ne(n, 0)), (f**(a + b)*log(x), True))
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+5/2*n),x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^n + a)*x^(5/2*n - 1), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int f^{a+b\,x^n}\,x^{\frac{5\,n}{2}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)*x^((5*n)/2 - 1),x)
```

```
[Out] int(f^(a + b*x^n)*x^((5*n)/2 - 1), x)
```

3.190 $\int f^{a+bx^n} x^{-1+\frac{3n}{2}}\,dx$

Optimal. Leaf size=74

$$-\frac{f^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x^{n/2}\sqrt{\log(f)}\right)}{2b^{3/2}n\log^{\frac{3}{2}}(f)}+\frac{f^{a+bx^n}x^{n/2}}{bn\log(f)}$$

```
[Out] f^(a+b*x^n)*x^(1/2*n)/b/n/ln(f)-1/2*f^a*erfi(x^(1/2*n)*b^(1/2)*ln(f)^(1/2))
*Pi^(1/2)/b^(3/2)/n/ln(f)^(3/2)
```

Rubi [A]
time = 0.05, antiderivative size = 74, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.158$, Rules used = {2244, 2242, 2235}

$$\frac{x^{n/2}f^{a+bx^n}}{bn\log(f)}-\frac{\sqrt{\pi}\,f^a\mathrm{Erfi}\left(\sqrt{b}\,\sqrt{\log(f)}\,x^{n/2}\right)}{2b^{3/2}n\log^{\frac{3}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)*x^(-1 + (3*n)/2),x]
```

```
[Out] -1/2*(f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x^(n/2)*Sqrt[Log[f]]])/(b^(3/2)*n*Log[f]^(3
/2)) + (f^(a + b*x^n)*x^(n/2))/(b*n*Log[f])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2244

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^Simplify[m - n]*
F^(a + b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && Integer
Q[2*Simplify[(m + 1)/n]] && LtQ[0, Simplify[(m + 1)/n], 5] &&  !RationalQ[m
] && SumSimplerQ[m, -n]
```

Rubi steps

$$\begin{aligned}\int f^{a+bx^n}x^{-1+\frac{3n}{2}}\,dx &= \frac{f^{a+bx^n}x^{n/2}}{bn\log(f)}-\frac{\int f^{a+bx^n}x^{\frac{1}{2}(-2+n)}\,dx}{2b\log(f)}\\ &= \frac{f^{a+bx^n}x^{n/2}}{bn\log(f)}-\frac{\text{Subst}\left(\int f^{a+bx^2}\,dx,x,x^{1+\frac{1}{2}(-2+n)}\right)}{bn\log(f)}\\ &= -\frac{f^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,x^{n/2}\sqrt{\log(f)}\right)}{2b^{3/2}n\log^{\frac{3}{2}}(f)}+\frac{f^{a+bx^n}x^{n/2}}{bn\log(f)}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 39, normalized size = 0.53

$$-\frac{f^a x^{3n/2}\Gamma\left(\frac{3}{2},-bx^n\log(f)\right)}{n\left(-bx^n\log(f)\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x^(-1 + (3*n)/2),x]
```

```
[Out] -((f^a*x^((3*n)/2)*Gamma[3/2, -(b*x^n*Log[f])])/(n*(-(b*x^n*Log[f]))^(3/2))
)
```

Maple [A]
time = 0.04, size = 67, normalized size = 0.91

method	result	size
risch	$\frac{f^a x^{\frac{n}{2}} f^{b\,x^n}}{n\ln(f)b}-\frac{f^a\sqrt{\pi}\,\text{erf}\left(\sqrt{-b\ln(f)}\,x^{\frac{n}{2}}\right)}{2n\ln(f)b\sqrt{-b\ln(f)}}$	67
meijerg	$\frac{f^a\left(\frac{x^{\frac{n}{2}}(-b)^{\frac{3}{2}}\sqrt{\ln(f)}\,e^{b\,x^n\ln(f)}}{b}-\frac{(-b)^{\frac{3}{2}}\sqrt{\pi}\,\text{erfi}\left(x^{\frac{n}{2}}\sqrt{b}\,\sqrt{\ln(f)}\right)}{2b^{\frac{3}{2}}}\right)}{(-b)^{\frac{3}{2}}\ln(f)^{\frac{3}{2}}n}$	71

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b*x^n)*x^(-1+3/2*n),x,method=_RETURNVERBOSE)
```

```
[Out] 1/n*f^a/ln(f)/b*x^(1/2*n)*f^(b*x^n)-1/2/n*f^a/ln(f)/b*Pi^(1/2)/(-b*ln(f))^(
1/2)*erf((-b*ln(f))^(1/2)*x^(1/2*n))
```

Maxima [A]
time = 0.33, size = 33, normalized size = 0.45

$$-\frac{f^{a}x^{\frac{3}{2}n}\Gamma\left(\frac{3}{2}, -bx^{n}\log\left(f\right)\right)}{\left(-bx^{n}\log\left(f\right)\right)^{\frac{3}{2}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+3/2*n),x, algorithm="maxima")
```

```
[Out] -f^a*x^(3/2*n)*gamma(3/2, -b*x^n*log(f))/((-b*x^n*log(f))^(3/2)*n)
```

Fricas [A]
time = 0.41, size = 64, normalized size = 0.86

$$\frac{2\,bx^{\frac{1}{2}n}e^{\left(bx^{n}\log(f)+a\log(f)\right)}\log\left(f\right)+\sqrt{\pi}\,\sqrt{-b\log\left(f\right)}\,f^{a}\operatorname{erf}\left(\sqrt{-b\log\left(f\right)}\,x^{\frac{1}{2}n}\right)}{2\,b^{2}n\log\left(f\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+3/2*n),x, algorithm="fricas")
```

```
[Out] 1/2*(2*b*x^(1/2*n)*e^(b*x^n*log(f) + a*log(f))*log(f) + sqrt(pi)*sqrt(-b*lo
g(f))*f^a*erf(sqrt(-b*log(f))*x^(1/2*n)))/(b^2*n*log(f)^2)
```

Sympy [A]
time = 65.13, size = 56, normalized size = 0.76

$$\begin{cases} -\frac{4bf^{a}f^{bx^{n}}x^{\frac{5n}{2}}\log\left(f\right)}{15n}+\frac{2f^{a}f^{bx^{n}}x^{\frac{3n}{2}}}{3n} & \text{for}\: n \neq 0 \\ f^{a+b}\log\left(x\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**(-1+3/2*n),x)
```

```
[Out] Piecewise((-4*b*f**a*f**(b*x**n)*x**(5*n/2)*log(f)/(15*n) + 2*f**a*f**(b*x*
*n)*x**(3*n/2)/(3*n), Ne(n, 0)), (f**(a + b)*log(x), True))
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+3/2*n),x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^n + a)*x^(3/2*n - 1), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int f^{a+b\,x^n}\,x^{\frac{3\,n}{2}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)*x^((3*n)/2 - 1),x)
[Out] int(f^(a + b*x^n)*x^((3*n)/2 - 1), x)
```

3.191 $\int f^{a+bx^n} x^{-1+\frac{n}{2}} \, dx$

Optimal. Leaf size=43

$$\frac{f^a \sqrt{\pi} \operatorname{erfi}\left(\sqrt{b}\, x^{n/2} \sqrt{\log(f)}\right)}{\sqrt{b}\, n \sqrt{\log(f)}}$$

```
[Out] f^a*erfi(x^(1/2*n)*b^(1/2)*ln(f)^(1/2))*Pi^(1/2)/n/b^(1/2)/ln(f)^(1/2)
```

Rubi [A]

time = 0.03, antiderivative size = 43, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.105$, Rules used = {2242, 2235}

$$\frac{\sqrt{\pi}\, f^a \operatorname{Erfi}\left(\sqrt{b}\, \sqrt{\log(f)}\, x^{n/2}\right)}{\sqrt{b}\, n \sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)*x^(-1 + n/2),x]
```

```
[Out] (f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x^(n/2)*Sqrt[Log[f]]])/(Sqrt[b]*n*Sqrt[Log[f]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rubi steps

$$\begin{aligned} \int f^{a+bx^n} x^{-1+\frac{n}{2}} \, dx &= \frac{2\text{Subst}\left(\int f^{a+bx^2} \, dx, x, x^{n/2}\right)}{n} \\ &= \frac{f^a \sqrt{\pi} \operatorname{erfi}\left(\sqrt{b}\, x^{n/2} \sqrt{\log(f)}\right)}{\sqrt{b}\, n \sqrt{\log(f)}} \end{aligned}$$

Mathematica [A]
time = 0.01, size = 43, normalized size = 1.00

$$\frac{f^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x^{n/2}\sqrt{\log(f)}\right)}{\sqrt{b}\,n\sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x^(-1 + n/2),x]
[Out] (f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x^(n/2)*Sqrt[Log[f]]])/(Sqrt[b]*n*Sqrt[Log[f]])
```

Maple [A]
time = 0.04, size = 32, normalized size = 0.74

method	result	size
meijerg	$\frac{f^a\,\mathrm{erfi}\left(x^{\frac{n}{2}}\sqrt{b}\,\sqrt{\ln(f)}\right)\sqrt{\pi}}{n\sqrt{b}\,\sqrt{\ln(f)}}$	32
risch	$\frac{f^a\sqrt{\pi}\,\mathrm{erf}\left(\sqrt{-b\ln(f)}\,x^{\frac{n}{2}}\right)}{n\sqrt{-b\ln(f)}}$	32

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b*x^n)*x^(-1+1/2*n),x,method=_RETURNVERBOSE)
[Out] f^a*erfi(x^(1/2*n)*b^(1/2)*ln(f)^(1/2))*Pi^(1/2)/n/b^(1/2)/ln(f)^(1/2)
```

Maxima [A]
time = 0.33, size = 38, normalized size = 0.88

$$\frac{\sqrt{\pi}\,f^a x^{\frac{1}{2}\,n}\left(\mathrm{erf}\left(\sqrt{-bx^n\log(f)}\right)-1\right)}{\sqrt{-bx^n\log(f)}\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+1/2*n),x, algorithm="maxima")
[Out] sqrt(pi)*f^a*x^(1/2*n)*(erf(sqrt(-b*x^n*log(f))) - 1)/(sqrt(-b*x^n*log(f))*
n)
```

Fricas [A]
time = 0.39, size = 42, normalized size = 0.98

$$-\frac{\sqrt{\pi}\,\sqrt{-b\log(f)}\,f^a\,\mathrm{erf}\left(\sqrt{-b\log(f)}\,xx^{\frac{1}{2}\,n-1}\right)}{bn\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+1/2*n),x, algorithm="fricas")
```

```
[Out] -sqrt(pi)*sqrt(-b*log(f))*f^a*erf(sqrt(-b*log(f))*x*x^(1/2*n - 1))/(b*n*log
(f))
```

Sympy [A]
time = 85.97, size = 53, normalized size = 1.23

$$\begin{cases} -\frac{4bf^a f^{bx^n} x^{\frac{3n}{2}} \log(f)}{3n} + \frac{2f^a f^{bx^n} x^{\frac{n}{2}}}{n} & \text{for } n \neq 0 \\ f^{a+b} \log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**(-1+1/2*n),x)
```

```
[Out] Piecewise((-4*b*f**a*f**(b*x**n)*x**(3*n/2)*log(f)/(3*n) + 2*f**a*f**(b*x**
n)*x**(n/2)/n, Ne(n, 0)), (f**(a + b)*log(x), True))
```

Giac [A]
time = 6.06, size = 33, normalized size = 0.77

$$-\frac{\sqrt{\pi} f^a \operatorname{erf}\left(-\sqrt{-b\log(f)}\sqrt{x^n}\right)}{\sqrt{-b\log(f)}\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+1/2*n),x, algorithm="giac")
```

```
[Out] -sqrt(pi)*f^a*erf(-sqrt(-b*log(f))*sqrt(x^n))/(sqrt(-b*log(f))*n)
```

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

$$\int f^{a+b\,x^n}\,x^{\frac{n}{2}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)*x^(n/2 - 1),x)
```

```
[Out] int(f^(a + b*x^n)*x^(n/2 - 1), x)
```

3.192 $\int f^{a+bx^n} x^{-1-\frac{n}{2}} \, dx$

Optimal. Leaf size=66

$$-\frac{2f^{a+bx^n}x^{-n/2}}{n}+\frac{2\sqrt{b}\, f^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\, x^{n/2}\sqrt{\log(f)}\right)\sqrt{\log(f)}}{n}$$

```
[Out] -2*f^(a+b*x^n)/n/(x^(1/2*n))+2*f^a*erfi(x^(1/2*n)*b^(1/2)*ln(f)^(1/2))*b^(1
/2)*Pi^(1/2)*ln(f)^(1/2)/n
```

Rubi [A]
time = 0.04, antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {2246, 2242, 2235}

$$\frac{2\sqrt{\pi}\sqrt{b}\, f^a\sqrt{\log(f)}\,\text{Erfi}\left(\sqrt{b}\sqrt{\log(f)}\, x^{n/2}\right)}{n}-\frac{2x^{-n/2}f^{a+bx^n}}{n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)*x^(-1 - n/2),x]
```

```
[Out] (-2*f^(a + b*x^n))/(n*x^(n/2)) + (2*Sqrt[b]*f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x^(n/
2)*Sqrt[Log[f]]]*Sqrt[Log[f]])/n
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2246

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^Simplify[m + n]*F^(a + b*(c
 + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && IntegerQ[2*Simplif
y[(m + 1)/n]] && LtQ[-4, Simplify[(m + 1)/n], 5] &&  !RationalQ[m] && SumSi
mplerQ[m, n]
```

Rule Rubi steps

$$\int f^{a+bx^n}x^{-1-\frac{n}{2}}\,dx = -\frac{2f^{a+bx^n}x^{-n/2}}{n} + (2b\log(f))\int f^{a+bx^n}x^{\frac{1}{2}(-2+n)}\,dx$$
$$= -\frac{2f^{a+bx^n}x^{-n/2}}{n} + \frac{(4b\log(f))\mathrm{Subst}\left(\int f^{a+bx^2}\,dx, x, x^{1+\frac{1}{2}(-2+n)}\right)}{n}$$
$$= -\frac{2f^{a+bx^n}x^{-n/2}}{n} + \frac{2\sqrt{b}\,f^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x^{n/2}\sqrt{\log(f)}\right)\sqrt{\log(f)}}{n}$$

Mathematica [A]
time = 0.01, size = 39, normalized size = 0.59

$$-\frac{f^a x^{-n/2}\Gamma\left(-\frac{1}{2}, -bx^n\log(f)\right)\sqrt{-bx^n\log(f)}}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x^(-1 - n/2),x]
[Out] -((f^a*Gamma[-1/2, -(b*x^n*Log[f])]*Sqrt[-(b*x^n*Log[f])])/(n*x^(n/2)))
```

Maple [A]
time = 0.05, size = 59, normalized size = 0.89

method	result	size
risch	$-\frac{2f^a x^{-\frac{n}{2}} f^{b\,x^n}}{n}+\frac{2f^a\ln(f)b\sqrt{\pi}\,\operatorname{erf}\left(\sqrt{-b\ln(f)}\,x^{\frac{n}{2}}\right)}{n\sqrt{-b\ln(f)}}$	59
meijerg	$\frac{f^a\sqrt{-b}\,\sqrt{\ln(f)}\left(-\frac{2x^{-\frac{n}{2}}\mathrm{e}^{b\,x^n\ln(f)}}{\sqrt{-b}\,\sqrt{\ln(f)}}+\frac{2\sqrt{b}\,\sqrt{\pi}\,\operatorname{erfi}\left(x^{\frac{n}{2}}\sqrt{b}\,\sqrt{\ln(f)}\right)}{\sqrt{-b}}\right)}{n}$	69

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b*x^n)*x^(-1-1/2*n),x,method=_RETURNVERBOSE)
[Out] -2/n*f^a/(x^(1/2*n))*f^(b*x^n)+2/n*f^a*ln(f)*b*Pi^(1/2)/(-b*ln(f))^(1/2)*er
f((-b*ln(f))^(1/2)*x^(1/2*n))
```

Maxima [A]
time = 0.33, size = 35, normalized size = 0.53

$$-\frac{\sqrt{-bx^n\log(f)}\,f^a\Gamma\left(-\frac{1}{2}, -bx^n\log(f)\right)}{nx^{\frac{1}{2}n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1-1/2*n),x, algorithm="maxima")
[Out] -sqrt(-b*x^n*log(f))*f^a*gamma(-1/2, -b*x^n*log(f))/(n*x^(1/2*n))
```

Fricas [A]
time = 0.41, size = 83, normalized size = 1.26

$$-\frac{2\left(\sqrt{\pi}\sqrt{-b\log\left(f\right)}f^{a}\operatorname{erf}\left(\frac{\sqrt{-b\log\left(f\right)}}{xx^{-\frac{1}{2}n-1}}\right)+xx^{-\frac{1}{2}n-1}e^{\left(\frac{ax^{2}x^{-n-2}\log\left(f\right)+b\log\left(f\right)}{x^{2}x^{-n-2}}\right)}\right)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1-1/2*n),x, algorithm="fricas")
[Out] -2*(sqrt(pi)*sqrt(-b*log(f))*f^a*erf(sqrt(-b*log(f))/(x*x^(-1/2*n - 1))) +
x*x^(-1/2*n - 1)*e^((a*x^2*x^(-n - 2)*log(f) + b*log(f))/(x^2*x^(-n - 2))))
/n
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**(-1-1/2*n),x)
[Out] Timed out
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1-1/2*n),x, algorithm="giac")
[Out] integrate(f^(b*x^n + a)*x^(-1/2*n - 1), x)
```

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

$$\int \frac{f^{a+b\,x^n}}{x^{\frac{n}{2}+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)/x^(n/2 + 1),x)
[Out] int(f^(a + b*x^n)/x^(n/2 + 1), x)
```

3.193 $\int f^{a+bx^n} x^{-1-\frac{3n}{2}}\,dx$

Optimal. Leaf size=96

$$-\frac{2f^{a+bx^n}x^{-3n/2}}{3n}-\frac{4bf^{a+bx^n}x^{-n/2}\log(f)}{3n}+\frac{4b^{3/2}f^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x^{n/2}\sqrt{\log(f)}\right)\log^{\frac{3}{2}}(f)}{3n}$$

```
[Out] -2/3*f^(a+b*x^n)/n/(x^(3/2*n))-4/3*b*f^(a+b*x^n)*ln(f)/n/(x^(1/2*n))+4/3*b^
(3/2)*f^a*erfi(x^(1/2*n)*b^(1/2)*ln(f)^(1/2))*ln(f)^(3/2)*Pi^(1/2)/n
```

Rubi [A]
time = 0.07, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {2246, 2242, 2235}

$$\frac{4\sqrt{\pi}\,b^{3/2}f^a\log^{\frac{3}{2}}(f)\mathrm{Erfi}\left(\sqrt{b}\,\sqrt{\log(f)}\,x^{n/2}\right)}{3n}-\frac{2x^{-3n/2}f^{a+bx^n}}{3n}-\frac{4b\log(f)x^{-n/2}f^{a+bx^n}}{3n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)*x^(-1 - (3*n)/2),x]
```

```
[Out] (-2*f^(a + b*x^n))/(3*n*x^((3*n)/2)) - (4*b*f^(a + b*x^n)*Log[f])/(3*n*x^(n
/2)) + (4*b^(3/2)*f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x^(n/2)*Sqrt[Log[f]]]*Log[f]^(3
/2))/(3*n)
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2246

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^Simplify[m + n]*F^(a + b*(c
 + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && IntegerQ[2*Simplif
y[(m + 1)/n]] && LtQ[-4, Simplify[(m + 1)/n], 5] &&  !RationalQ[m] && SumSi
mplerQ[m, n]
```

Rubi steps

$$\begin{aligned}\int f^{a+bx^n}x^{-1-\frac{3n}{2}}\,dx &= -\frac{2f^{a+bx^n}x^{-3n/2}}{3n}+\frac{1}{3}(2b\log(f))\int f^{a+bx^n}x^{-1-\frac{n}{2}}\,dx\\ &= -\frac{2f^{a+bx^n}x^{-3n/2}}{3n}-\frac{4bf^{a+bx^n}x^{-n/2}\log(f)}{3n}+\frac{1}{3}\left(4b^2\log^2(f)\right)\int f^{a+bx^n}x^{\frac{1}{2}(-2+n)}\,dx\\ &= -\frac{2f^{a+bx^n}x^{-3n/2}}{3n}-\frac{4bf^{a+bx^n}x^{-n/2}\log(f)}{3n}+\frac{\left(8b^2\log^2(f)\right)\text{Subst}\left(\int f^{a+bx^2}\,dx,x,x^{1+\frac{1}{2}(\cdot}\right.}{3n}\\ &= -\frac{2f^{a+bx^n}x^{-3n/2}}{3n}-\frac{4bf^{a+bx^n}x^{-n/2}\log(f)}{3n}+\frac{4b^{3/2}f^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,x^{n/2}\sqrt{\log(f)}\right)\log^{\frac{3}{2}}(}{3n}\end{aligned}$$

Mathematica [**A**]
time = 0.01, size = 39, normalized size = 0.41

$$-\frac{f^ax^{-3n/2}\Gamma\left(-\frac{3}{2},-bx^n\log(f)\right)\left(-bx^n\log(f)\right)^{3/2}}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x^(-1 - (3*n)/2),x]
```

```
[Out] -((f^a*Gamma[-3/2, -(b*x^n*Log[f])]*(-(b*x^n*Log[f]))^(3/2))/(n*x^((3*n)/2)
))
```

Maple [**A**]
time = 0.06, size = 79, normalized size = 0.82

method	result	size
meijerg	$\frac{f^a(-b)^{\frac{3}{2}}\ln(f)^{\frac{3}{2}}\left(-\frac{2x^{-\frac{3n}{2}}(2bx^n\ln(f)+1)e^{bx^n\ln(f)}}{3(-b)^{\frac{3}{2}}\ln(f)^{\frac{3}{2}}}+\frac{4b^{\frac{3}{2}}\sqrt{\pi}\,\text{erfi}\left(x^{\frac{n}{2}}\sqrt{b}\,\sqrt{\ln(f)}\right)}{3(-b)^{\frac{3}{2}}}\right)}{n}$	79
risch	$-\frac{2f^ax^{-\frac{3n}{2}}f^{bx^n}}{3n}-\frac{4f^a\ln(f)bx^{-\frac{n}{2}}f^{bx^n}}{3n}+\frac{4f^a\ln(f)^2b^2\sqrt{\pi}\,\text{erf}\left(\sqrt{-b\ln(f)}\,x^{\frac{n}{2}}\right)}{3n\sqrt{-b\ln(f)}}$	88

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b*x^n)*x^(-1-3/2*n),x,method=_RETURNVERBOSE)
```

```
[Out] f^a*(-b)^(3/2)*ln(f)^(3/2)/n*(-2/3*x^(-3/2*n)/(-b)^(3/2)/ln(f)^(3/2)*(2*b*x
^n*ln(f)+1)*exp(b*x^n*ln(f))+4/3/(-b)^(3/2)*b^(3/2)*Pi^(1/2)*erfi(x^(1/2*n)
*b^(1/2)*ln(f)^(1/2)))
```

Maxima [A]
time = 0.33, size = 35, normalized size = 0.36

$$-\frac{\left(-bx^n\log\left(f\right)\right)^{\frac{3}{2}}f^a\Gamma\left(-\frac{3}{2},-bx^n\log\left(f\right)\right)}{nx^{\frac{3}{2}n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1-3/2*n),x, algorithm="maxima")
[Out] -(-b*x^n*log(f))^(3/2)*f^a*gamma(-3/2, -b*x^n*log(f))/(n*x^(3/2*n))
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1-3/2*n),x, algorithm="fricas")
[Out] integral(f^(b*x^n + a)*x^(-3/2*n - 1), x)
```

Sympy [A]
time = 66.73, size = 56, normalized size = 0.58

$$\begin{cases} -\frac{4bf^af^{bx^n}x^{-\frac{n}{2}}\log\left(f\right)}{3n}-\frac{2f^af^{bx^n}x^{-\frac{3n}{2}}}{3n} & \text{for}\ n\neq 0\\ f^{a+b}\log\left(x\right) & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**(-1-3/2*n),x)
[Out] Piecewise((-4*b*f**a*f**(b*x**n)*log(f)/(3*n*x**(n/2)) - 2*f**a*f**(b*x**n)
/(3*n*x**(3*n/2)), Ne(n, 0)), (f**(a + b)*log(x), True))
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1-3/2*n),x, algorithm="giac")
[Out] integrate(f^(b*x^n + a)*x^(-3/2*n - 1), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{f^{a+b\,x^n}}{x^{\frac{3\,n}{2}+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)/x^((3*n)/2 + 1),x)
[Out] int(f^(a + b*x^n)/x^((3*n)/2 + 1), x)
```

3.194 $\int e^{-0.1x}x\,dx$

Optimal. Leaf size=16

$$-100.e^{-0.1x} - 10.e^{-0.1x}x$$

```
[Out] -100.*exp(-.1*x)-10.*exp(-.1*x)*x
```

Rubi [A]
time = 0.01, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {2207, 2225}

$$-10.e^{-0.1x}x - 100.e^{-0.1x}$$

Antiderivative was successfully verified.

```
[In] Int[x/E^(0.1*x),x]
```

```
[Out] -100./E^(0.1*x) - (10.*x)/E^(0.1*x)
```

Rule 2207

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[(c + d*x)^m*((b*F^(g*(e + f*x)))^n/(f*g*n*Log[F])),
x] - Dist[d*(m/(f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !TrueQ[$UseGamma]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned} \int e^{-0.1x}x\,dx &= -10.e^{-0.1x}x + 10.\int e^{-0.1x}\,dx \\ &= -100.e^{-0.1x} - 10.e^{-0.1x}x \end{aligned}$$

Mathematica [A]
time = 0.00, size = 11, normalized size = 0.69

$$e^{-0.1x}(-100. - 10.x)$$

Antiderivative was successfully verified.

```
[In] Integrate[x/E^(0.1*x),x]
```

```
[Out] (-99.99999999999999 - 10.*x)/E^(0.1*x)
```

Maple [A]
time = 0.01, size = 15, normalized size = 0.94

method	result	size
gosper	$-10.0(x+10.0)\,\mathrm{e}^{-0.1000000000x}$	10
risch	$(-100.0-10.0x)\,\mathrm{e}^{-0.1000000000x}$	11
meijerg	$100.0-50.0(2.0+0.2000000000x)\,\mathrm{e}^{-0.1000000000x}$	14
derivativedivides	$-10.0\,\mathrm{e}^{-0.1000000000x}x-100.0\,\mathrm{e}^{-0.1000000000x}$	15
default	$-10.0\,\mathrm{e}^{-0.1000000000x}x-100.0\,\mathrm{e}^{-0.1000000000x}$	15
norman	$-10.0\,\mathrm{e}^{-0.1000000000x}x-100.0\,\mathrm{e}^{-0.1000000000x}$	15

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-.1*x)*x,x,method=_RETURNVERBOSE)
```

```
[Out] -10.*exp(-.1000000000*x)*x-100.*exp(-.1000000000*x)
```

Maxima [A]
time = 0.28, size = 9, normalized size = 0.56

$$-10\,(x+10)e^{\left(-\frac{1}{10}\,x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-.1*x)*x,x, algorithm="maxima")
```

```
[Out] -10*(x + 10)*e^(-1/10*x)
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-.1*x)*x,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> An error occurred when FriCAS evaluated '(x)
*(exp((x)*(((-0.10000000000000001)::EXPR INT))))':    Cannot convert the va
lue from type Float to Expression(Integer) .
```

Sympy [A]
time = 0.03, size = 10, normalized size = 0.62

$$1.0(-10.0x-100.0)\,e^{-0.1x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-.1*x)*x,x)
```

```
[Out] 1.0*(-10.0*x - 100.0)*exp(-0.1*x)
```

Giac [A]
time = 3.03, size = 10, normalized size = 0.62

$$(-10.0000000000000\,x - 100.000000000000)e^{(-0.100000000000000\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-.1*x)*x,x, algorithm="giac")
```

```
[Out] (-10.0000000000000*x - 100.000000000000)*e^(-0.100000000000000*x)
```

Mupad [B]
time = 0.03, size = 9, normalized size = 0.56

$$-10\,\mathrm{e}^{-0.1\,x}\,(x+10.0)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*exp(-0.1*x),x)
```

```
[Out] -10*exp(-0.1*x)*(x + 10.0)
```

3.195 $\int f^{c(a+bx)^2} x^3 \, dx$

Optimal. Leaf size=203

$$-\frac{f^{c(a+bx)^2}}{2b^4c^2\log^2(f)}+\frac{3a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)}{4b^4c^{3/2}\log^{\frac{3}{2}}(f)}+\frac{3a^2f^{c(a+bx)^2}}{2b^4c\log(f)}-\frac{3af^{c(a+bx)^2}(a+bx)}{2b^4c\log(f)}+\frac{f^{c(a+bx)^2}(a+bx)^2}{2b^4c\log(f)}$$

```
[Out] -1/2*f^(c*(b*x+a)^2)/b^4/c^2/ln(f)^2+3/2*a^2*f^(c*(b*x+a)^2)/b^4/c/ln(f)-3/
2*a*f^(c*(b*x+a)^2)*(b*x+a)/b^4/c/ln(f)+1/2*f^(c*(b*x+a)^2)*(b*x+a)^2/b^4/c
/ln(f)+3/4*a*erfi((b*x+a)*c^(1/2)*ln(f)^(1/2))*Pi^(1/2)/b^4/c^(3/2)/ln(f)^(
3/2)-1/2*a^3*erfi((b*x+a)*c^(1/2)*ln(f)^(1/2))*Pi^(1/2)/b^4/c^(1/2)/ln(f)^(
1/2)
```

Rubi [A]
time = 0.13, antiderivative size = 203, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$, Rules used = {2258, 2235, 2240, 2243}

$$-\frac{\sqrt{\pi}\,a^3\,\mathrm{Erfi}\left(\sqrt{c}\,\sqrt{\log(f)}\,(a+bx)\right)}{2b^4\sqrt{c}\,\sqrt{\log(f)}}+\frac{3a^2f^{c(a+bx)^2}}{2b^4c\log(f)}+\frac{3\sqrt{\pi}\,a\,\mathrm{Erfi}\left(\sqrt{c}\,\sqrt{\log(f)}\,(a+bx)\right)}{4b^4c^{3/2}\log^{\frac{3}{2}}(f)}-\frac{f^{c(a+bx)^2}}{2b^4c^2\log^2(f)}+\frac{(a+bx)^2f^{c(a+bx)^2}}{2b^4c\log(f)}-\frac{3a(a+bx)f^{c(a+bx)^2}}{2b^4c\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c*(a + b*x)^2)*x^3,x]
```

```
[Out] -1/2*f^(c*(a + b*x)^2)/(b^4*c^2*Log[f]^2) + (3*a*Sqrt[Pi]*Erfi[Sqrt[c]*(a +
 b*x)*Sqrt[Log[f]]])/(4*b^4*c^(3/2)*Log[f]^(3/2)) + (3*a^2*f^(c*(a + b*x)^2
))/(2*b^4*c*Log[f]) - (3*a*f^(c*(a + b*x)^2)*(a + b*x))/(2*b^4*c*Log[f]) +
(f^(c*(a + b*x)^2)*(a + b*x)^2)/(2*b^4*c*Log[f]) - (a^3*Sqrt[Pi]*Erfi[Sqrt[
c]*(a + b*x)*Sqrt[Log[f]]])/(2*b^4*Sqrt[c]*Sqrt[Log[f]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
```

```
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{c(a+bx)^2}x^3\,dx = \int\left(-\frac{a^3f^{c(a+bx)^2}}{b^3}+\frac{3a^2f^{c(a+bx)^2}(a+bx)}{b^3}-\frac{3af^{c(a+bx)^2}(a+bx)^2}{b^3}+\frac{f^{c(a+bx)^2}(a+bx)^3}{b^3}\right)\,d$$

$$=\frac{\int f^{c(a+bx)^2}(a+bx)^3\,dx}{b^3}-\frac{(3a)\int f^{c(a+bx)^2}(a+bx)^2\,dx}{b^3}+\frac{(3a^2)\int f^{c(a+bx)^2}(a+bx)\,dx}{b^3}-\frac{a^3}{}$$

$$=\frac{3a^2f^{c(a+bx)^2}}{2b^4c\log(f)}-\frac{3af^{c(a+bx)^2}(a+bx)}{2b^4c\log(f)}+\frac{f^{c(a+bx)^2}(a+bx)^2}{2b^4c\log(f)}-\frac{a^3\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(}\right.}{2b^4\sqrt{c}\,\sqrt{\log(f)}}$$

$$=-\frac{f^{c(a+bx)^2}}{2b^4c^2\log^2(f)}+\frac{3a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)}{4b^4c^{3/2}\log^{\frac{3}{2}}(f)}+\frac{3a^2f^{c(a+bx)^2}}{2b^4c\log(f)}-\frac{3af^{c(a+bx)^2}(a+b}{2b^4c\log(f)}$$

Mathematica [A]
time = 0.19, size = 96, normalized size = 0.47

$$\frac{a\sqrt{c}\,\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)\sqrt{\log(f)}\,(3-2a^2c\log(f))+2f^{c(a+bx)^2}(-1+c(a^2-abx+b^2x^2)\log(f))}{4b^4c^2\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c*(a + b*x)^2)*x^3,x]
```

```
[Out] (a*Sqrt[c]*Sqrt[Pi]*Erfi[Sqrt[c]*(a + b*x)*Sqrt[Log[f]]]*Sqrt[Log[f]]*(3 -
2*a^2*c*Log[f]) + 2*f^(c*(a + b*x)^2)*(-1 + c*(a^2 - a*b*x + b^2*x^2)*Log[f
]))/(4*b^4*c^2*Log[f]^2)
```

Maple [A]
time = 0.07, size = 249, normalized size = 1.23

method	result

risch	$\frac{x^{2} f^{b^{2} c\,x^{2}} f^{2abcx} f^{a^{2} c}}{2c\,b^{2} \ln(f)} - \frac{ax\,f^{b^{2} c\,x^{2}} f^{2abcx} f^{a^{2} c}}{2b^{3} c\ln(f)} + \frac{a^{2} f^{b^{2} c\,x^{2}} f^{2abcx} f^{a^{2} c}}{2b^{4} c\ln(f)} + \frac{a^{3} \sqrt{\pi}\ \mathrm{erf}\left(-b\sqrt{-c\ln(f)}\,x + \frac{ca\ln(f)}{\sqrt{-c\ln(f)}}\right.}{2b^{4}\sqrt{-c\ln(f)}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^2)*x^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/c/b^2/ln(f)*x^2*f^(b^2*c*x^2)*f^(2*a*b*c*x)*f^(a^2*c)-1/2*a/b^3/c/ln(f)
*x*f^(b^2*c*x^2)*f^(2*a*b*c*x)*f^(a^2*c)+1/2*a^2/b^4/c/ln(f)*f^(b^2*c*x^2)*
f^(2*a*b*c*x)*f^(a^2*c)+1/2*a^3/b^4*Pi^(1/2)/(-c*ln(f))^(1/2)*erf(-b*(-c*ln
(f))^(1/2)*x+c*a*ln(f)/(-c*ln(f))^(1/2))-3/4*a/b^4/c/ln(f)*Pi^(1/2)/(-c*ln(
f))^(1/2)*erf(-b*(-c*ln(f))^(1/2)*x+c*a*ln(f)/(-c*ln(f))^(1/2))-1/2/c^2/b^4
/ln(f)^2*f^(b^2*c*x^2)*f^(2*a*b*c*x)*f^(a^2*c)
```

Maxima [A]
time = 0.40, size = 264, normalized size = 1.30

$$-\frac{\frac{\sqrt{\pi}\,(b^{2}cx+abc)a^{3}c^{3}\left(\mathrm{erf}\left(\sqrt{-\frac{(b^{2}cx+abc)^{2}\log(f)}{b^{2}c}}\right)-1\right)\log(f)^{4}}{(c\log(f))^{\frac{7}{2}}b^{4}\sqrt{-\frac{(b^{2}cx+abc)^{2}\log(f)}{b^{2}c}}} - \frac{3\,a^{2}c^{3}f^{\frac{(b^{2}cx+abc)^{2}}{b^{2}c}}\log(f)^{3}}{(c\log(f))^{\frac{7}{2}}b^{3}} - \frac{3\,(b^{2}cx+abc)^{3}ac\Gamma\left(\frac{3}{2},-\frac{(b^{2}cx+abc)^{2}\log(f)}{b^{2}c}\right)\log(f)^{4}}{(c\log(f))^{\frac{7}{2}}b^{6}\left(-\frac{(b^{2}cx+abc)^{2}\log(f)}{b^{2}c}\right)^{\frac{3}{2}}} + \frac{c^{2}\Gamma\left(2,-\frac{(b^{2}cx+abc)^{2}\log(f)}{b^{2}c}\right)\log(f)^{2}}{(c\log(f))^{\frac{7}{2}}b^{3}}}{2\sqrt{c\log(f)}\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)*x^3,x, algorithm="maxima")
```

```
[Out] -1/2*(sqrt(pi)*(b^2*c*x + a*b*c)*a^3*c^3*(erf(sqrt(-(b^2*c*x + a*b*c)^2*log
(f)/(b^2*c))) - 1)*log(f)^4/((c*log(f))^(7/2)*b^4*sqrt(-(b^2*c*x + a*b*c)^2
*log(f)/(b^2*c))) - 3*a^2*c^3*f^((b^2*c*x + a*b*c)^2/(b^2*c))*log(f)^3/((c*
log(f))^(7/2)*b^3) - 3*(b^2*c*x + a*b*c)^3*a*c*gamma(3/2, -(b^2*c*x + a*b*c
)^2*log(f)/(b^2*c))*log(f)^4/((c*log(f))^(7/2)*b^6*(-(b^2*c*x + a*b*c)^2*lo
g(f)/(b^2*c))^(3/2)) + c^2*gamma(2, -(b^2*c*x + a*b*c)^2*log(f)/(b^2*c))*lo
g(f)^2/((c*log(f))^(7/2)*b^3))/(sqrt(c*log(f))*b)
```

Fricas [A]
time = 0.36, size = 113, normalized size = 0.56

$$\frac{\sqrt{\pi}\,(2\,a^{3}c\log(f)-3\,a)\sqrt{-b^{2}c\log(f)}\ \mathrm{erf}\left(\frac{\sqrt{-b^{2}c\log(f)}\,(bx+a)}{b}\right)+2\,((b^{3}cx^{2}-ab^{2}cx+a^{2}bc)\log(f)-b)f^{b^{2}cx^{2}+2\,abcx+a^{2}c}}{4\,b^{5}c^{2}\log(f)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)*x^3,x, algorithm="fricas")
```

```
[Out] 1/4*(sqrt(pi)*(2*a^3*c*log(f) - 3*a)*sqrt(-b^2*c*log(f))*erf(sqrt(-b^2*c*lo
g(f))*(b*x + a)/b) + 2*((b^3*c*x^2 - a*b^2*c*x + a^2*b*c)*log(f) - b)*f^(b^
2*c*x^2 + 2*a*b*c*x + a^2*c))/(b^5*c^2*log(f)^2)
```

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

$$\int f^{c(a+bx)^2} x^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**2)*x**3,x)
```

```
[Out] Integral(f**(c*(a + b*x)**2)*x**3, x)
```

Giac [A]
time = 3.52, size = 136, normalized size = 0.67

$$\frac{\frac{\sqrt{\pi}\,(2\,a^3 c\log(f)-3\,a)\,\mathrm{erf}\left(-\sqrt{-c\log(f)}\,b\left(x+\frac{a}{b}\right)\right)}{\sqrt{-c\log(f)}\,bc\log(f)}+\frac{2\left(b^2c\left(x+\frac{a}{b}\right)^2\log(f)-3\,abc\left(x+\frac{a}{b}\right)\log(f)+3\,a^2c\log(f)-1\right)e^{\left(b^2cx^2\log(f)+2\,abcx\log(f)+a^2c\log(f)\right)}}{bc^2\log(f)^2}}{4\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)*x^3,x, algorithm="giac")
```

```
[Out] 1/4*(sqrt(pi)*(2*a^3*c*log(f) - 3*a)*erf(-sqrt(-c*log(f))*b*(x + a/b))/(sqr
t(-c*log(f))*b*c*log(f)) + 2*(b^2*c*(x + a/b)^2*log(f) - 3*a*b*c*(x + a/b)*
log(f) + 3*a^2*c*log(f) - 1)*e^(b^2*c*x^2*log(f) + 2*a*b*c*x*log(f) + a^2*c
*log(f))/(b*c^2*log(f)^2))/b^3
```

Mupad [B]
time = 3.56, size = 171, normalized size = 0.84

$$\frac{f^{b^2\,c\,x^2}\,f^{a^2\,c}\,f^{2\,a\,b\,c\,x}\,x^2}{2\,b^2\,c\,\ln(f)}-\frac{\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{c\,\ln(f)}\,(a+b\,x)\right)\,\left(\frac{a^3}{b^4}-\frac{3\,a}{2\,b^4\,c\,\ln(f)}\right)}{2\,\sqrt{c\,\ln(f)}}+\frac{f^{b^2\,c\,x^2}\,f^{a^2\,c}\,f^{2\,a\,b\,c\,x}\,\left(\frac{a^2\,c\,\ln(f)}{2}-\frac{1}{2}\right)}{b^4\,c^2\,\ln(f)^2}-\frac{a\,f^{b^2\,c\,x^2}\,f^{a^2\,c}\,f^{2\,a\,b\,c\,x}\,x}{2\,b^3\,c\,\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^2)*x^3,x)
```

```
[Out] (f^(b^2*c*x^2)*f^(a^2*c)*f^(2*a*b*c*x)*x^2)/(2*b^2*c*log(f)) - (pi^(1/2)*er
fi((c*log(f))^(1/2)*(a + b*x))*(a^3/b^4 - (3*a)/(2*b^4*c*log(f))))/(2*(c*lo
g(f))^(1/2)) + (f^(b^2*c*x^2)*f^(a^2*c)*f^(2*a*b*c*x)*((a^2*c*log(f))/2 - 1
/2))/(b^4*c^2*log(f)^2) - (a*f^(b^2*c*x^2)*f^(a^2*c)*f^(2*a*b*c*x)*x)/(2*b^
3*c*log(f))
```

3.196 $\int f^{c(a+bx)^2} x^2 \, dx$

Optimal. Leaf size=140

$$-\frac{\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)}{4b^3c^{3/2}\log^{\frac{3}{2}}(f)}-\frac{af^{c(a+bx)^2}}{b^3c\log(f)}+\frac{f^{c(a+bx)^2}(a+bx)}{2b^3c\log(f)}+\frac{a^2\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)}{2b^3\sqrt{c}\,\sqrt{\log(f)}}$$

```
[Out] -a*f^(c*(b*x+a)^2)/b^3/c/ln(f)+1/2*f^(c*(b*x+a)^2)*(b*x+a)/b^3/c/ln(f)-1/4*
erfi((b*x+a)*c^(1/2)*ln(f)^(1/2))*Pi^(1/2)/b^3/c^(3/2)/ln(f)^(3/2)+1/2*a^2*
erfi((b*x+a)*c^(1/2)*ln(f)^(1/2))*Pi^(1/2)/b^3/c^(1/2)/ln(f)^(1/2)
```

Rubi [A]
time = 0.09, antiderivative size = 140, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$, Rules used = {2258, 2235, 2240, 2243}

$$\frac{\sqrt{\pi}\,a^2\mathrm{Erfi}\left(\sqrt{c}\,\sqrt{\log(f)}\,(a+bx)\right)}{2b^3\sqrt{c}\,\sqrt{\log(f)}}-\frac{\sqrt{\pi}\,\mathrm{Erfi}\left(\sqrt{c}\,\sqrt{\log(f)}\,(a+bx)\right)}{4b^3c^{3/2}\log^{\frac{3}{2}}(f)}+\frac{(a+bx)f^{c(a+bx)^2}}{2b^3c\log(f)}-\frac{af^{c(a+bx)^2}}{b^3c\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c*(a + b*x)^2)*x^2,x]
```

```
[Out] -1/4*(Sqrt[Pi]*Erfi[Sqrt[c]*(a + b*x)*Sqrt[Log[f]]])/(b^3*c^(3/2)*Log[f]^(3
/2)) - (a*f^(c*(a + b*x)^2))/(b^3*c*Log[f]) + (f^(c*(a + b*x)^2)*(a + b*x))
/(2*b^3*c*Log[f]) + (a^2*Sqrt[Pi]*Erfi[Sqrt[c]*(a + b*x)*Sqrt[Log[f]]])/(2*
b^3*Sqrt[c]*Sqrt[Log[f]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
```

```
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{c(a+bx)^2}x^2\,dx = \int\left(\frac{a^2f^{c(a+bx)^2}}{b^2}-\frac{2af^{c(a+bx)^2}(a+bx)}{b^2}+\frac{f^{c(a+bx)^2}(a+bx)^2}{b^2}\right)dx$$

$$= \frac{\int f^{c(a+bx)^2}(a+bx)^2\,dx}{b^2}-\frac{(2a)\int f^{c(a+bx)^2}(a+bx)\,dx}{b^2}+\frac{a^2\int f^{c(a+bx)^2}\,dx}{b^2}$$

$$= -\frac{af^{c(a+bx)^2}}{b^3c\log(f)}+\frac{f^{c(a+bx)^2}(a+bx)}{2b^3c\log(f)}+\frac{a^2\sqrt{\pi}\operatorname{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)}{2b^3\sqrt{c}\,\sqrt{\log(f)}}-\frac{\int f^{c(a+bx)^2}\,dx}{2b^2c\log(f)}$$

$$= -\frac{\sqrt{\pi}\operatorname{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)}{4b^3c^{3/2}\log^{\frac{3}{2}}(f)}-\frac{af^{c(a+bx)^2}}{b^3c\log(f)}+\frac{f^{c(a+bx)^2}(a+bx)}{2b^3c\log(f)}+\frac{a^2\sqrt{\pi}\operatorname{erfi}\left(\sqrt{c}\,(a\right.}{2b^3\sqrt{c}\,\sqrt{}}$$

Mathematica [A]
time = 0.15, size = 83, normalized size = 0.59

$$\frac{-2\sqrt{c}\,f^{c(a+bx)^2}(a-bx)\sqrt{\log(f)}+\sqrt{\pi}\operatorname{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)(-1+2a^2c\log(f))}{4b^3c^{3/2}\log^{\frac{3}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c*(a + b*x)^2)*x^2,x]
```

```
[Out] (-2*Sqrt[c]*f^(c*(a + b*x)^2)*(a - b*x)*Sqrt[Log[f]] + Sqrt[Pi]*Erfi[Sqrt[c
]*(a + b*x)*Sqrt[Log[f]]]*(-1 + 2*a^2*c*Log[f]))/(4*b^3*c^(3/2)*Log[f]^(3/2
))
```

Maple [A]
time = 0.03, size = 168, normalized size = 1.20

method	result

risch	$\frac{x f^{b^2 c x^2} f^{2abcx} f^{a^2 c}}{2c b^2 \ln(f)} - \frac{a f^{b^2 c x^2} f^{2abcx} f^{a^2 c}}{2b^3 c \ln(f)} - \frac{a^2 \sqrt{\pi}\, \mathrm{erf}\left(-b\sqrt{-c\ln(f)}\, x + \frac{ca\ln(f)}{\sqrt{-c\ln(f)}}\right)}{2b^3\sqrt{-c\ln(f)}} + \frac{\sqrt{\pi}\, \mathrm{erf}\left(-b\sqrt{-\right.}{4c b^3 \ln}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(f^(c*(b*x+a)^2)*x^2,x,method=_RETURNVERBOSE)

[Out] 1/2/c/b^2/ln(f)*x*f^(b^2*c*x^2)*f^(2*a*b*c*x)*f^(a^2*c)-1/2*a/b^3/c/ln(f)*f^(b^2*c*x^2)*f^(2*a*b*c*x)*f^(a^2*c)-1/2*a^2/b^3*Pi^(1/2)/(-c*ln(f))^(1/2)*erf(-b*(-c*ln(f))^(1/2)*x+c*a*ln(f)/(-c*ln(f))^(1/2))+1/4/c/b^3/ln(f)*Pi^(1/2)/(-c*ln(f))^(1/2)*erf(-b*(-c*ln(f))^(1/2)*x+c*a*ln(f)/(-c*ln(f))^(1/2))

Maxima [A]
time = 0.38, size = 218, normalized size = 1.56

$$\frac{\frac{\sqrt{\pi}\,(b^2cx+abc)a^2c^2\left(\mathrm{erf}\left(\sqrt{-\frac{(b^2cx+abc)^2\log(f)}{b^2c}}\right)-1\right)\log(f)^3}{(c\log(f))^{\frac{5}{2}}b^3\sqrt{-\frac{(b^2cx+abc)^2\log(f)}{b^2c}}} - \frac{2ac^2 f^{\frac{(b^2cx+abc)^2}{b^2c}}\log(f)^2}{(c\log(f))^{\frac{5}{2}}b^2} - \frac{(b^2cx+abc)^3\Gamma\left(\frac{3}{2}, -\frac{(b^2cx+abc)^2\log(f)}{b^2c}\right)\log(f)^3}{(c\log(f))^{\frac{5}{2}}b^5\left(-\frac{(b^2cx+abc)^2\log(f)}{b^2c}\right)^{\frac{3}{2}}}}{2\sqrt{c\log(f)}\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(c*(b*x+a)^2)*x^2,x, algorithm="maxima")

[Out] 1/2*(sqrt(pi)*(b^2*c*x + a*b*c)*a^2*c^2*(erf(sqrt(-(b^2*c*x + a*b*c)^2*log(f)/(b^2*c))) - 1)*log(f)^3/((c*log(f))^(5/2)*b^3*sqrt(-(b^2*c*x + a*b*c)^2*log(f)/(b^2*c))) - 2*a*c^2*f^((b^2*c*x + a*b*c)^2/(b^2*c))*log(f)^2/((c*log(f))^(5/2)*b^2) - (b^2*c*x + a*b*c)^3*gamma(3/2, -(b^2*c*x + a*b*c)^2*log(f)/(b^2*c))*log(f)^3/((c*log(f))^(5/2)*b^5*(-(b^2*c*x + a*b*c)^2*log(f)/(b^2*c))^(3/2)))/(sqrt(c*log(f))*b)

Fricas [A]
time = 0.37, size = 95, normalized size = 0.68

$$-\frac{\sqrt{\pi}\,(2a^2c\log(f)-1)\sqrt{-b^2c\log(f)}\,\mathrm{erf}\left(\frac{\sqrt{-b^2c\log(f)}\,(bx+a)}{b}\right) - 2(b^2cx-abc)f^{b^2cx^2+2abcx+a^2c}\log(f)}{4b^4c^2\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(c*(b*x+a)^2)*x^2,x, algorithm="fricas")

[Out] -1/4*(sqrt(pi)*(2*a^2*c*log(f) - 1)*sqrt(-b^2*c*log(f))*erf(sqrt(-b^2*c*log(f))*(b*x + a)/b) - 2*(b^2*c*x - a*b*c)*f^(b^2*c*x^2 + 2*a*b*c*x + a^2*c)*log(f))/(b^4*c^2*log(f)^2)

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

$$\int f^{c(a+bx)^2}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**2)*x**2,x)
```

```
[Out] Integral(f**(c*(a + b*x)**2)*x**2, x)
```

Giac [A]
time = 2.15, size = 107, normalized size = 0.76

$$-\frac{\frac{\sqrt{\pi}\,(2\,a^2c\log(f)-1)\,\mathrm{erf}\left(-\sqrt{-c\log\left(f\right)}\,b\left(x+\frac{a}{b}\right)\right)}{\sqrt{-c\log\left(f\right)}\,bc\log(f)}-\frac{2\left(b\left(x+\frac{a}{b}\right)-2\,a\right)e^{\left(b^2cx^2\log(f)+2\,abcx\log(f)+a^2c\log(f)\right)}}{bc\log(f)}}{4\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)*x^2,x, algorithm="giac")
```

```
[Out] -1/4*(sqrt(pi)*(2*a^2*c*log(f) - 1)*erf(-sqrt(-c*log(f))*b*(x + a/b))/(sqrt
(-c*log(f))*b*c*log(f)) - 2*(b*(x + a/b) - 2*a)*e^(b^2*c*x^2*log(f) + 2*a*b
*c*x*log(f) + a^2*c*log(f))/(b*c*log(f)))/b^2
```

Mupad [B]
time = 3.61, size = 121, normalized size = 0.86

$$\frac{\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{c\,\ln\left(f\right)}\,\left(a+b\,x\right)\right)\,\left(\frac{a^2}{b^3}-\frac{1}{2\,b^3\,c\,\ln(f)}\right)}{2\,\sqrt{c\,\ln\left(f\right)}}-\frac{a\,f^{b^2\,c\,x^2}\,f^{a^2\,c}\,f^{2\,a\,b\,c\,x}}{2\,b^3\,c\,\ln\left(f\right)}+\frac{f^{b^2\,c\,x^2}\,f^{a^2\,c}\,f^{2\,a\,b\,c\,x}\,x}{2\,b^2\,c\,\ln\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^2)*x^2,x)
```

```
[Out] (pi^(1/2)*erfi((c*log(f))^(1/2)*(a + b*x))*(a^2/b^3 - 1/(2*b^3*c*log(f))))/
(2*(c*log(f))^(1/2)) - (a*f^(b^2*c*x^2)*f^(a^2*c)*f^(2*a*b*c*x))/(2*b^3*c*l
og(f)) + (f^(b^2*c*x^2)*f^(a^2*c)*f^(2*a*b*c*x)*x)/(2*b^2*c*log(f))
```

3.197 $\int f^{c(a+bx)^2} x\,dx$

Optimal. Leaf size=68

$$\frac{f^{c(a+bx)^2}}{2b^2c\log(f)} - \frac{a\sqrt{\pi}\,\text{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)}{2b^2\sqrt{c}\,\sqrt{\log(f)}}$$

```
[Out] 1/2*f^(c*(b*x+a)^2)/b^2/c/ln(f)-1/2*a*erfi((b*x+a)*c^(1/2)*ln(f)^(1/2))*Pi^
(1/2)/b^2/c^(1/2)/ln(f)^(1/2)
```

Rubi [A]
time = 0.04, antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$, Rules used = {2258, 2235, 2240}

$$\frac{f^{c(a+bx)^2}}{2b^2c\log(f)} - \frac{\sqrt{\pi}\,a\text{Erfi}\left(\sqrt{c}\,\sqrt{\log(f)}\,(a+bx)\right)}{2b^2\sqrt{c}\,\sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c*(a + b*x)^2)*x,x]
```

```
[Out] f^(c*(a + b*x)^2)/(2*b^2*c*Log[f]) - (a*Sqrt[Pi]*Erfi[Sqrt[c]*(a + b*x)*Sqr
t[Log[f]]])/(2*b^2*Sqrt[c]*Sqrt[Log[f]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{c(a+bx)^2} x\,dx = \int \left(-\frac{af^{c(a+bx)^2}}{b} + \frac{f^{c(a+bx)^2}(a+bx)}{b}\right) dx$$
$$= \frac{\int f^{c(a+bx)^2}(a+bx)\,dx}{b} - \frac{a\int f^{c(a+bx)^2}\,dx}{b}$$
$$= \frac{f^{c(a+bx)^2}}{2b^2c\log(f)} - \frac{a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)}{2b^2\sqrt{c}\,\sqrt{\log(f)}}$$

Mathematica [A]
time = 0.05, size = 63, normalized size = 0.93

$$\frac{f^{c(a+bx)^2} - a\sqrt{c}\,\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)\sqrt{\log(f)}}{2b^2c\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c*(a + b*x)^2)*x,x]
```

```
[Out] (f^(c*(a + b*x)^2) - a*Sqrt[c]*Sqrt[Pi]*Erfi[Sqrt[c]*(a + b*x)*Sqrt[Log[f]]
]*Sqrt[Log[f]])/(2*b^2*c*Log[f])
```

Maple [A]
time = 0.04, size = 80, normalized size = 1.18

method	result	size
risch	$\frac{f^{b^2cx^2} f^{2abcx} f^{a^2c}}{2cb^2\ln(f)} + \frac{a\sqrt{\pi}\,\mathrm{erf}\left(-b\sqrt{-c\ln(f)}\,x + \frac{ca\ln(f)}{\sqrt{-c\ln(f)}}\right)}{2b^2\sqrt{-c\ln(f)}}$	80

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^2)*x,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/c/b^2/ln(f)*f^(b^2*c*x^2)*f^(2*a*b*c*x)*f^(a^2*c)+1/2*a/b^2*Pi^(1/2)/(-
c*ln(f))^(1/2)*erf(-b*(-c*ln(f))^(1/2)*x+c*a*ln(f)/(-c*ln(f))^(1/2))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 131 vs. 2(54) = 108.

time = 0.36, size = 131, normalized size = 1.93

$$-\frac{\frac{\sqrt{\pi}\,(b^2cx+abc)ac\left(\operatorname{erf}\left(\sqrt{-\frac{(b^2cx+abc)^2\log(f)}{b^2c}}\right)-1\right)\log(f)^2}{(c\log(f))^{\frac{3}{2}}b^2\sqrt{-\frac{(b^2cx+abc)^2\log(f)}{b^2c}}}-\frac{cf^{\frac{(b^2cx+abc)^2}{b^2c}}\log(f)}{(c\log(f))^{\frac{3}{2}}b}}{2\sqrt{c\log(f)}\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)*x,x, algorithm="maxima")
```

```
[Out] -1/2*(sqrt(pi)*(b^2*c*x + a*b*c)*a*c*(erf(sqrt(-(b^2*c*x + a*b*c)^2*log(f)/
(b^2*c))) - 1)*log(f)^2/((c*log(f))^(3/2)*b^2*sqrt(-(b^2*c*x + a*b*c)^2*log
(f)/(b^2*c))) - c*f^((b^2*c*x + a*b*c)^2/(b^2*c))*log(f)/((c*log(f))^(3/2)*
b))/(sqrt(c*log(f))*b)
```

Fricas [A]
time = 0.39, size = 72, normalized size = 1.06

$$\frac{\sqrt{\pi}\,\sqrt{-b^2c\log(f)}\,a\operatorname{erf}\left(\frac{\sqrt{-b^2c\log(f)}\,(bx+a)}{b}\right)+bf^{b^2cx^2+2\,abcx+a^2c}}{2\,b^3c\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)*x,x, algorithm="fricas")
```

```
[Out] 1/2*(sqrt(pi)*sqrt(-b^2*c*log(f))*a*erf(sqrt(-b^2*c*log(f))*(b*x + a)/b) +
b*f^(b^2*c*x^2 + 2*a*b*c*x + a^2*c))/(b^3*c*log(f))
```

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

$$\int f^{c(a+bx)^2}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**2)*x,x)
```

```
[Out] Integral(f**(c*(a + b*x)**2)*x, x)
```

Giac [A]
time = 2.90, size = 77, normalized size = 1.13

$$\frac{\frac{\sqrt{\pi}\,a\operatorname{erf}\left(-\sqrt{-c\log(f)}\,b\left(x+\frac{a}{b}\right)\right)}{\sqrt{-c\log(f)}\,b}+\frac{e^{\left(b^2cx^2\log(f)+2\,abcx\log(f)+a^2c\log(f)\right)}}{bc\log(f)}}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)*x,x, algorithm="giac")
```

```
[Out] 1/2*(sqrt(pi)*a*erf(-sqrt(-c*log(f))*b*(x + a/b))/(sqrt(-c*log(f))*b) + e^(
b^2*c*x^2*log(f) + 2*a*b*c*x*log(f) + a^2*c*log(f))/(b*c*log(f)))/b
```

Mupad [B]
time = 3.48, size = 66, normalized size = 0.97

$$\frac{f^{b^2\,c\,x^2}\,f^{a^2\,c}\,f^{2\,a\,b\,c\,x}}{2\,b^2\,c\,\ln\left(f\right)}-\frac{a\,\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{c\,\ln\left(f\right)}\,\left(a+b\,x\right)\right)}{2\,b^2\,\sqrt{c\,\ln\left(f\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^2)*x,x)
```

```
[Out] (f^(b^2*c*x^2)*f^(a^2*c)*f^(2*a*b*c*x))/(2*b^2*c*log(f)) - (a*pi^(1/2)*erfi
((c*log(f))^(1/2)*(a + b*x)))/(2*b^2*(c*log(f))^(1/2))
```

3.198 $\int f^{c(a+bx)^2}\,dx$

Optimal. Leaf size=41

$$\frac{\sqrt{\pi}\,\text{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)}{2b\sqrt{c}\,\sqrt{\log(f)}}$$

```
[Out] 1/2*erfi((b*x+a)*c^(1/2)*ln(f)^(1/2))*Pi^(1/2)/b/c^(1/2)/ln(f)^(1/2)
```

Rubi [A]
time = 0.01, antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = $\{2235\}$

$$\frac{\sqrt{\pi}\,\text{Erfi}\left(\sqrt{c}\,\sqrt{\log(f)}\,(a+bx)\right)}{2b\sqrt{c}\,\sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c*(a + b*x)^2),x]
```

```
[Out] (Sqrt[Pi]*Erfi[Sqrt[c]*(a + b*x)*Sqrt[Log[f]]])/(2*b*Sqrt[c]*Sqrt[Log[f]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rubi steps

$$\int f^{c(a+bx)^2}\,dx = \frac{\sqrt{\pi}\,\text{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)}{2b\sqrt{c}\,\sqrt{\log(f)}}$$

Mathematica [A]
time = 0.03, size = 41, normalized size = 1.00

$$\frac{\sqrt{\pi}\,\text{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)}{2b\sqrt{c}\,\sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c*(a + b*x)^2),x]
```

```
[Out] (Sqrt[Pi]*Erfi[Sqrt[c]*(a + b*x)*Sqrt[Log[f]]])/(2*b*Sqrt[c]*Sqrt[Log[f]])
```

Maple [A]
time = 0.02, size = 41, normalized size = 1.00

method	result	size
risch	$-\frac{\sqrt{\pi}\,\mathrm{erf}\left(-b\sqrt{-c\ln\left(f\right)}\,x+\frac{ca\ln\left(f\right)}{\sqrt{-c\ln\left(f\right)}}\right)}{2b\sqrt{-c\ln\left(f\right)}}$	41

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*Pi^(1/2)/b/(-c*ln(f))^(1/2)*erf(-b*(-c*ln(f))^(1/2)*x+c*a*ln(f)/(-c*ln
(f))^(1/2))
```

Maxima [A]
time = 0.29, size = 40, normalized size = 0.98

$$\frac{\sqrt{\pi}\,\mathrm{erf}\left(\sqrt{-c\log\left(f\right)}\,bx-\frac{ac\log\left(f\right)}{\sqrt{-c\log\left(f\right)}}\right)}{2\sqrt{-c\log\left(f\right)}\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(pi)*erf(sqrt(-c*log(f))*b*x - a*c*log(f)/sqrt(-c*log(f)))/(sqrt(-c
*log(f))*b)
```

Fricas [A]
time = 0.35, size = 45, normalized size = 1.10

$$-\frac{\sqrt{\pi}\,\sqrt{-b^{2}c\log\left(f\right)}\,\mathrm{erf}\left(\frac{\sqrt{-b^{2}c\log\left(f\right)}\,(bx+a)}{b}\right)}{2\,b^{2}c\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b^2*c*log(f))*erf(sqrt(-b^2*c*log(f))*(b*x + a)/b)/(b^2
*c*log(f))
```

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

$$\int f^{c(a+bx)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**2),x)
```

```
[Out] Integral(f**(c*(a + b*x)**2), x)
```

Giac [A]
time = 3.03, size = 33, normalized size = 0.80

$$-\frac{\sqrt{\pi}\,\operatorname{erf}\left(-\sqrt{-c\log\left(f\right)}\,b\left(x+\frac{a}{b}\right)\right)}{2\,\sqrt{-c\log\left(f\right)}\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*erf(-sqrt(-c*log(f))*b*(x + a/b))/(sqrt(-c*log(f))*b)
```

Mupad [B]
time = 0.04, size = 45, normalized size = 1.10

$$-\frac{\sqrt{\pi}\,\operatorname{erf}\left(\frac{1\mathrm{i}\,c\,x\,\ln(f)\,b^2+1\mathrm{i}\,a\,c\,\ln(f)\,b}{\sqrt{b^2\,c\,\ln\left(f\right)}}\right)\,1\mathrm{i}}{2\,\sqrt{b^2\,c\,\ln\left(f\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^2),x)
```

```
[Out] -(pi^(1/2)*erf((a*b*c*log(f)*1i + b^2*c*x*log(f)*1i)/(b^2*c*log(f))^(1/2))*
1i)/(2*(b^2*c*log(f))^(1/2))
```

3.199 $\int \frac{f^{c(a+bx)^2}}{x} dx$

Optimal. Leaf size=18

$$\text{Int}\left(\frac{f^{c(a+bx)^2}}{x},x\right)$$

```
[Out] Unintegrable(f^(c*(b*x+a)^2)/x,x)
```

Rubi [A]
time = 0.01, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{f^{c(a+bx)^2}}{x} dx$$

Verification is not applicable to the result.

```
[In] Int[f^(c*(a + b*x)^2)/x,x]
```

```
[Out] Defer[Int][f^(c*(a + b*x)^2)/x, x]
```

Rubi steps

$$\int \frac{f^{c(a+bx)^2}}{x} dx = \int \frac{f^{c(a+bx)^2}}{x} dx$$

Mathematica [A]
time = 0.13, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^2}}{x} dx$$

Verification is not applicable to the result.

```
[In] Integrate[f^(c*(a + b*x)^2)/x,x]
```

```
[Out] Integrate[f^(c*(a + b*x)^2)/x, x]
```

Maple [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{c(bx+a)^2}}{x} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^2)/x,x)
```

```
[Out] int(f^(c*(b*x+a)^2)/x,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)/x,x, algorithm="maxima")
```

```
[Out] integrate(f^((b*x + a)^2*c)/x, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)/x,x, algorithm="fricas")
```

```
[Out] integral(f^(b^2*c*x^2 + 2*a*b*c*x + a^2*c)/x, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**2)/x,x)
```

```
[Out] Integral(f**(c*(a + b*x)**2)/x, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)/x,x, algorithm="giac")
```

```
[Out] integrate(f^((b*x + a)^2*c)/x, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{f^{c\,(a+b\,x)^2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^2)/x,x)
```

```
[Out] int(f^(c*(a + b*x)^2)/x, x)
```

3.200 $\int \frac{f^{c(a+bx)^2}}{x^2}\,dx$

Optimal. Leaf size=78

$$-\frac{f^{c(a+bx)^2}}{x}+b\sqrt{c}\,\sqrt{\pi}\,\text{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)\sqrt{\log(f)}+2abc\log(f)\text{Int}\left(\frac{f^{c(a+bx)^2}}{x},x\right)$$

```
[Out] -f^(c*(b*x+a)^2)/x+b*erfi((b*x+a)*c^(1/2)*ln(f)^(1/2))*c^(1/2)*Pi^(1/2)*ln(
f)^(1/2)+2*a*b*c*ln(f)*Unintegrable(f^(c*(b*x+a)^2)/x,x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{f^{c(a+bx)^2}}{x^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[f^(c*(a + b*x)^2)/x^2,x]
```

```
[Out] -(f^(c*(a + b*x)^2)/x) + b*Sqrt[c]*Sqrt[Pi]*Erfi[Sqrt[c]*(a + b*x)*Sqrt[Log
[f]]]*Sqrt[Log[f]] + 2*a*b*c*Log[f]*Defer[Int][f^(c*(a + b*x)^2)/x, x]
```

Rubi steps

$$\begin{aligned}\int \frac{f^{c(a+bx)^2}}{x^2}\,dx &= -\frac{f^{c(a+bx)^2}}{x}+(2abc\log(f))\int \frac{f^{c(a+bx)^2}}{x}\,dx+\left(2b^2c\log(f)\right)\int f^{c(a+bx)^2}\,dx\\ &= -\frac{f^{c(a+bx)^2}}{x}+b\sqrt{c}\,\sqrt{\pi}\,\text{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)\sqrt{\log(f)}+(2abc\log(f))\int \frac{f^{c(a+bx)^2}}{x}\end{aligned}$$

Mathematica [A]
time = 0.48, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^2}}{x^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[f^(c*(a + b*x)^2)/x^2,x]
```

```
[Out] Integrate[f^(c*(a + b*x)^2)/x^2, x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{f^{c(bx+a)^2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^2)/x^2,x)
[Out] int(f^(c*(b*x+a)^2)/x^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)/x^2,x, algorithm="maxima")
[Out] integrate(f^((b*x + a)^2*c)/x^2, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)/x^2,x, algorithm="fricas")
[Out] integral(f^(b^2*c*x^2 + 2*a*b*c*x + a^2*c)/x^2, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**2)/x**2,x)
[Out] Integral(f**(c*(a + b*x)**2)/x**2, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)/x^2,x, algorithm="giac")
```

```
[Out] integrate(f^((b*x + a)^2*c)/x^2, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{f^{c\,(a+b\,x)^2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^2)/x^2,x)
```

```
[Out] int(f^(c*(a + b*x)^2)/x^2, x)
```

3.201 $\int \frac{f^{c(a+bx)^2}}{x^3} dx$

Optimal. Leaf size=137

$$-\frac{f^{c(a+bx)^2}}{2x^2}-\frac{abcf^{c(a+bx)^2}\log(f)}{x}+ab^2c^{3/2}\sqrt{\pi}\,\text{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)\log^{\frac{3}{2}}(f)+b^2c\log(f)\text{Int}\left(\frac{f^{c(a+bx)^2}}{x},x\right)$$

```
[Out] -1/2*f^(c*(b*x+a)^2)/x^2-a*b*c*f^(c*(b*x+a)^2)*ln(f)/x+a*b^2*c^(3/2)*erfi((
b*x+a)*c^(1/2)*ln(f)^(1/2))*ln(f)^(3/2)*Pi^(1/2)+b^2*c*ln(f)*Unintegrable(f
^(c*(b*x+a)^2)/x,x)+2*a^2*b^2*c^2*ln(f)^2*Unintegrable(f^(c*(b*x+a)^2)/x,x)
```

Rubi [A]
time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{f^{c(a+bx)^2}}{x^3} dx$$

Verification is not applicable to the result.

```
[In] Int[f^(c*(a + b*x)^2)/x^3,x]
```

```
[Out] -1/2*f^(c*(a + b*x)^2)/x^2 - (a*b*c*f^(c*(a + b*x)^2)*Log[f])/x + a*b^2*c^(
3/2)*Sqrt[Pi]*Erfi[Sqrt[c]*(a + b*x)*Sqrt[Log[f]]]*Log[f]^(3/2) + b^2*c*Log
[f]*Defer[Int][f^(c*(a + b*x)^2)/x, x] + 2*a^2*b^2*c^2*Log[f]^2*Defer[Int][
f^(c*(a + b*x)^2)/x, x]
```

Rubi steps

$$\begin{aligned}\int \frac{f^{c(a+bx)^2}}{x^3} dx &= -\frac{f^{c(a+bx)^2}}{2x^2}+(abc\log(f))\int \frac{f^{c(a+bx)^2}}{x^2} dx+\left(b^2c\log(f)\right)\int \frac{f^{c(a+bx)^2}}{x} dx\\ &= -\frac{f^{c(a+bx)^2}}{2x^2}-\frac{abcf^{c(a+bx)^2}\log(f)}{x}+\left(b^2c\log(f)\right)\int \frac{f^{c(a+bx)^2}}{x} dx+\left(2a^2b^2c^2\log^2(f)\right)\int \frac{f^{c(a+}}{x}\\ &= -\frac{f^{c(a+bx)^2}}{2x^2}-\frac{abcf^{c(a+bx)^2}\log(f)}{x}+ab^2c^{3/2}\sqrt{\pi}\,\text{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)\log^{\frac{3}{2}}(f)+\left(b^2c\log\right.\end{aligned}$$

Mathematica [A]
time = 0.39, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^2}}{x^3} dx$$

Verification is not applicable to the result.

```
[In] Integrate[f^(c*(a + b*x)^2)/x^3,x]
[Out] Integrate[f^(c*(a + b*x)^2)/x^3, x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{f^{c(bx+a)^2}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^2)/x^3,x)
[Out] int(f^(c*(b*x+a)^2)/x^3,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)/x^3,x, algorithm="maxima")
[Out] integrate(f^((b*x + a)^2*c)/x^3, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)/x^3,x, algorithm="fricas")
[Out] integral(f^(b^2*c*x^2 + 2*a*b*c*x + a^2*c)/x^3, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^2}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**2)/x**3,x)
[Out] Integral(f**(c*(a + b*x)**2)/x**3, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^((b*x + a)^2*c)/x^3, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{f^{c\,(a+b\,x)^2}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^2)/x^3,x)
```

```
[Out] int(f^(c*(a + b*x)^2)/x^3, x)
```

3.202 $\int f^{c(a+bx)^3}x^2\,dx$

Optimal. Leaf size=120

$$\frac{f^{c(a+bx)^3}}{3b^3c\log(f)}+\frac{2a(a+bx)^2\Gamma\left(\frac{2}{3},-c(a+bx)^3\log(f)\right)}{3b^3\left(-c(a+bx)^3\log(f)\right)^{2/3}}-\frac{a^2(a+bx)\Gamma\left(\frac{1}{3},-c(a+bx)^3\log(f)\right)}{3b^3\sqrt[3]{-c(a+bx)^3\log(f)}}$$

```
[Out] 1/3*f^(c*(b*x+a)^3)/b^3/c/ln(f)+2/3*a*(b*x+a)^2*GAMMA(2/3,-c*(b*x+a)^3*ln(f
))/b^3/(-c*(b*x+a)^3*ln(f))^(2/3)-1/3*a^2*(b*x+a)*GAMMA(1/3,-c*(b*x+a)^3*ln
(f))/b^3/(-c*(b*x+a)^3*ln(f))^(1/3)
```

Rubi [A]

time = 0.06, antiderivative size = 120, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {2258, 2239, 2250, 2240}

$$-\frac{a^2(a+bx)\text{Gamma}\left(\frac{1}{3},-c\log(f)(a+bx)^3\right)}{3b^3\sqrt[3]{-c\log(f)(a+bx)^3}}+\frac{2a(a+bx)^2\text{Gamma}\left(\frac{2}{3},-c\log(f)(a+bx)^3\right)}{3b^3\left(-c\log(f)(a+bx)^3\right)^{2/3}}+\frac{f^{c(a+bx)^3}}{3b^3c\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c*(a + b*x)^3)*x^2,x]
```

```
[Out] f^(c*(a + b*x)^3)/(3*b^3*c*Log[f]) + (2*a*(a + b*x)^2*Gamma[2/3, -(c*(a + b
*x)^3*Log[f])])/(3*b^3*(-(c*(a + b*x)^3*Log[f]))^(2/3)) - (a^2*(a + b*x)*Ga
mma[1/3, -(c*(a + b*x)^3*Log[f])])/(3*b^3*(-(c*(a + b*x)^3*Log[f]))^(1/3))
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\begin{aligned}\int f^{c(a+bx)^3}x^2\,dx &= \int \left(\frac{a^2 f^{c(a+bx)^3}}{b^2}-\frac{2af^{c(a+bx)^3}(a+bx)}{b^2}+\frac{f^{c(a+bx)^3}(a+bx)^2}{b^2}\right)dx\\ &= \frac{\int f^{c(a+bx)^3}(a+bx)^2\,dx}{b^2}-\frac{(2a)\int f^{c(a+bx)^3}(a+bx)\,dx}{b^2}+\frac{a^2\int f^{c(a+bx)^3}\,dx}{b^2}\\ &= \frac{f^{c(a+bx)^3}}{3b^3c\log(f)}+\frac{2a(a+bx)^2\Gamma\left(\frac{2}{3},-c(a+bx)^3\log(f)\right)}{3b^3\left(-c(a+bx)^3\log(f)\right)^{2/3}}-\frac{a^2(a+bx)\Gamma\left(\frac{1}{3},-c(a+bx)^3\log(f)\right)}{3b^3\sqrt[3]{-c(a+bx)^3\log(f)}}\end{aligned}$$

Mathematica [A]
time = 0.42, size = 111, normalized size = 0.92

$$\frac{\frac{f^{c(a+bx)^3}}{c\log(f)}+\frac{2a(a+bx)^2\Gamma\left(\frac{2}{3},-c(a+bx)^3\log(f)\right)}{\left(-c(a+bx)^3\log(f)\right)^{2/3}}-\frac{a^2(a+bx)\Gamma\left(\frac{1}{3},-c(a+bx)^3\log(f)\right)}{\sqrt[3]{-c(a+bx)^3\log(f)}}}{3b^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c*(a + b*x)^3)*x^2,x]
[Out] (f^(c*(a + b*x)^3)/(c*Log[f]) + (2*a*(a + b*x)^2*Gamma[2/3, -(c*(a + b*x)^3
*Log[f])])/(-(c*(a + b*x)^3*Log[f]))^(2/3) - (a^2*(a + b*x)*Gamma[1/3, -(c*
(a + b*x)^3*Log[f])])/(-(c*(a + b*x)^3*Log[f]))^(1/3))/(3*b^3)
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int f^{c(bx+a)^3}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^3)*x^2,x)
[Out] int(f^(c*(b*x+a)^3)*x^2,x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)*x^2,x, algorithm="maxima")
```

```
[Out] integrate(f^((b*x + a)^3*c)*x^2, x)
```

Fricas [A]
time = 0.09, size = 155, normalized size = 1.29

$$\frac{\left(-b^3 c \log\left(f\right)\right)^{\frac{2}{3}} a^2 \Gamma\left(\frac{1}{3}, -\left(b^3 c x^3 + 3\, a b^2 c x^2 + 3\, a^2 b c x + a^3 c\right) \log\left(f\right)\right) - 2 \left(-b^3 c \log\left(f\right)\right)^{\frac{1}{3}} a b \Gamma\left(\frac{2}{3}, -\left(b^3 c x^3 + 3\, a b^2 c x^2 + 3\, a^2 b c x + a^3 c\right) \log\left(f\right)\right) + b^2 f^{b^3 c x^3 + 3\, a b^2 c x^2 + 3\, a^2 b c x + a^3 c}}{3\, b^5 c \log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)*x^2,x, algorithm="fricas")
```

```
[Out] 1/3*((-b^3*c*log(f))^(2/3)*a^2*gamma(1/3, -(b^3*c*x^3 + 3*a*b^2*c*x^2 + 3*a
^2*b*c*x + a^3*c)*log(f)) - 2*(-b^3*c*log(f))^(1/3)*a*b*gamma(2/3, -(b^3*c*
x^3 + 3*a*b^2*c*x^2 + 3*a^2*b*c*x + a^3*c)*log(f)) + b^2*f^(b^3*c*x^3 + 3*a
*b^2*c*x^2 + 3*a^2*b*c*x + a^3*c))/(b^5*c*log(f))
```

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

$$\int f^{c(a+bx)^3} x^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**3)*x**2,x)
```

```
[Out] Integral(f**(c*(a + b*x)**3)*x**2, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)*x^2,x, algorithm="giac")
```

```
[Out] integrate(f^((b*x + a)^3*c)*x^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int f^{c\,(a+b\,x)^3}\, x^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^3)*x^2,x)
```

```
[Out] int(f^(c*(a + b*x)^3)*x^2, x)
```

3.203 $\int f^{c(a+bx)^3} x \, dx$

Optimal. Leaf size=92

$$-\frac{(a+bx)^2 \Gamma\left(\frac{2}{3}, -c(a+bx)^3 \log(f)\right)}{3b^2 \left(-c(a+bx)^3 \log(f)\right)^{2/3}} + \frac{a(a+bx) \Gamma\left(\frac{1}{3}, -c(a+bx)^3 \log(f)\right)}{3b^2 \sqrt[3]{-c(a+bx)^3 \log(f)}}$$

```
[Out] -1/3*(b*x+a)^2*GAMMA(2/3,-c*(b*x+a)^3*ln(f))/b^2/(-c*(b*x+a)^3*ln(f))^(2/3)
+1/3*a*(b*x+a)*GAMMA(1/3,-c*(b*x+a)^3*ln(f))/b^2/(-c*(b*x+a)^3*ln(f))^(1/3)
```

Rubi [A]
time = 0.03, antiderivative size = 92, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$, Rules used = {2258, 2239, 2250}

$$\frac{a(a+bx)\text{Gamma}\left(\frac{1}{3}, -c\log(f)(a+bx)^3\right)}{3b^2 \sqrt[3]{-c\log(f)(a+bx)^3}} - \frac{(a+bx)^2 \text{Gamma}\left(\frac{2}{3}, -c\log(f)(a+bx)^3\right)}{3b^2 \left(-c\log(f)(a+bx)^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c*(a + b*x)^3)*x,x]
```

```
[Out] -1/3*((a + b*x)^2*Gamma[2/3, -(c*(a + b*x)^3*Log[f])])/(b^2*(-(c*(a + b*x)^
3*Log[f]))^(2/3)) + (a*(a + b*x)*Gamma[1/3, -(c*(a + b*x)^3*Log[f])])/(3*b^
2*(-(c*(a + b*x)^3*Log[f]))^(1/3))
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{c(a+bx)^3}x\,dx = \int \left(-\frac{af^{c(a+bx)^3}}{b}+\frac{f^{c(a+bx)^3}(a+bx)}{b}\right)dx$$
$$= \frac{\int f^{c(a+bx)^3}(a+bx)\,dx}{b}-\frac{a\int f^{c(a+bx)^3}\,dx}{b}$$
$$= -\frac{(a+bx)^2\Gamma\left(\frac{2}{3},-c(a+bx)^3\log(f)\right)}{3b^2\left(-c(a+bx)^3\log(f)\right)^{2/3}}+\frac{a(a+bx)\Gamma\left(\frac{1}{3},-c(a+bx)^3\log(f)\right)}{3b^2\sqrt[3]{-c(a+bx)^3\log(f)}}$$

Mathematica [A]
time = 0.31, size = 86, normalized size = 0.93

$$-\frac{(a+bx)\left((a+bx)\Gamma\left(\frac{2}{3},-c(a+bx)^3\log(f)\right)-a\Gamma\left(\frac{1}{3},-c(a+bx)^3\log(f)\right)\sqrt[3]{-c(a+bx)^3\log(f)}\right)}{3b^2\left(-c(a+bx)^3\log(f)\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c*(a + b*x)^3)*x,x]
[Out] -1/3*((a + b*x)*((a + b*x)*Gamma[2/3, -(c*(a + b*x)^3*Log[f])] - a*Gamma[1/
3, -(c*(a + b*x)^3*Log[f])]*(-(c*(a + b*x)^3*Log[f]))^(1/3)))/(b^2*(-(c*(a
+ b*x)^3*Log[f]))^(2/3))
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int f^{c(bx+a)^3}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^3)*x,x)
[Out] int(f^(c*(b*x+a)^3)*x,x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)*x,x, algorithm="maxima")
[Out] integrate(f^((b*x + a)^3*c)*x, x)
```

Fricas [A]
time = 0.09, size = 114, normalized size = 1.24

$$-\frac{(-b^3c\log(f))^{\frac{2}{3}}a\Gamma\left(\frac{1}{3},-(b^3cx^3+3ab^2cx^2+3a^2bcx+a^3c)\log(f)\right)-(-b^3c\log(f))^{\frac{1}{3}}b\Gamma\left(\frac{2}{3},-(b^3cx^3+3ab^2cx^2+3a^2bcx+a^3c)\log(f)\right)}{3b^4c\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)*x,x, algorithm="fricas")
[Out] -1/3*((-b^3*c*log(f))^(2/3)*a*gamma(1/3, -(b^3*c*x^3 + 3*a*b^2*c*x^2 + 3*a^
2*b*c*x + a^3*c)*log(f)) - (-b^3*c*log(f))^(1/3)*b*gamma(2/3, -(b^3*c*x^3 +
 3*a*b^2*c*x^2 + 3*a^2*b*c*x + a^3*c)*log(f)))/(b^4*c*log(f))
```

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

$$\int f^{c(a+bx)^3}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**3)*x,x)
[Out] Integral(f**(c*(a + b*x)**3)*x, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)*x,x, algorithm="giac")
[Out] integrate(f^((b*x + a)^3*c)*x, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int f^{c\,(a+b\,x)^3}\,x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^3)*x,x)
[Out] int(f^(c*(a + b*x)^3)*x, x)
```

3.204 $\int f^{c(a+bx)^3}\,dx$

Optimal. Leaf size=44

$$-\frac{(a+bx)\Gamma\left(\frac{1}{3},-c(a+bx)^3\log(f)\right)}{3b\sqrt[3]{-c(a+bx)^3\log(f)}}$$

```
[Out] -1/3*(b*x+a)*GAMMA(1/3,-c*(b*x+a)^3*ln(f))/b/(-c*(b*x+a)^3*ln(f))^(1/3)
```

Rubi [A]
time = 0.00, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2239}

$$-\frac{(a+bx)\text{Gamma}\left(\frac{1}{3},-c\log(f)(a+bx)^3\right)}{3b\sqrt[3]{-c\log(f)(a+bx)^3}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c*(a + b*x)^3),x]
```

```
[Out] -1/3*((a + b*x)*Gamma[1/3, -(c*(a + b*x)^3*Log[f])])/(b*(-(c*(a + b*x)^3*Lo
g[f]))^(1/3))
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] && !IntegerQ[2/n]
```

Rubi steps

$$\int f^{c(a+bx)^3}\,dx=-\frac{(a+bx)\Gamma\left(\frac{1}{3},-c(a+bx)^3\log(f)\right)}{3b\sqrt[3]{-c(a+bx)^3\log(f)}}$$

Mathematica [A]
time = 0.06, size = 44, normalized size = 1.00

$$-\frac{(a+bx)\Gamma\left(\frac{1}{3},-c(a+bx)^3\log(f)\right)}{3b\sqrt[3]{-c(a+bx)^3\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c*(a + b*x)^3),x]
```

```
[Out] -1/3*((a + b*x)*Gamma[1/3, -(c*(a + b*x)^3*Log[f])])/(b*(-(c*(a + b*x)^3*Lo
g[f]))^(1/3))
```

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

$$\int f^{c(bx+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^3),x)
```

```
[Out] int(f^(c*(b*x+a)^3),x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3),x, algorithm="maxima")
```

```
[Out] integrate(f^((b*x + a)^3*c), x)
```

Fricas [A]
time = 0.09, size = 60, normalized size = 1.36

$$\frac{\left(-b^3c\log\left(f\right)\right)^{\frac{2}{3}}\Gamma\left(\frac{1}{3}, -\left(b^3cx^3+3\,ab^2cx^2+3\,a^2bcx+a^3c\right)\log\left(f\right)\right)}{3\,b^3c\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3),x, algorithm="fricas")
```

```
[Out] 1/3*(-b^3*c*log(f))^(2/3)*gamma(1/3, -(b^3*c*x^3 + 3*a*b^2*c*x^2 + 3*a^2*b*
c*x + a^3*c)*log(f))/(b^3*c*log(f))
```

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

$$\int f^{c(a+bx)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**3),x)
```

```
[Out] Integral(f**(c*(a + b*x)**3), x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3),x, algorithm="giac")
```

```
[Out] integrate(f^((b*x + a)^3*c), x)
```

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

$$\int f^{c\,(a+b\,x)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^3),x)
```

```
[Out] int(f^(c*(a + b*x)^3), x)
```

3.205 $\int \frac{f^{c(a+bx)^3}}{x}\,dx$

Optimal. Leaf size=18

$$\text{Int}\left(\frac{f^{c(a+bx)^3}}{x},x\right)$$

`[Out] Unintegrable(f^(c*(b*x+a)^3)/x,x)`

Rubi [A]
time = 0.01, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{f^{c(a+bx)^3}}{x}\,dx$$

Verification is not applicable to the result.

`[In] Int[f^(c*(a + b*x)^3)/x,x]`

`[Out] Defer[Int][f^(c*(a + b*x)^3)/x, x]`

Rubi steps

$$\int \frac{f^{c(a+bx)^3}}{x}\,dx = \int \frac{f^{c(a+bx)^3}}{x}\,dx$$

Mathematica [A]
time = 0.50, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^3}}{x}\,dx$$

Verification is not applicable to the result.

`[In] Integrate[f^(c*(a + b*x)^3)/x,x]`

`[Out] Integrate[f^(c*(a + b*x)^3)/x, x]`

Maple [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{c(bx+a)^3}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^3)/x,x)
```

```
[Out] int(f^(c*(b*x+a)^3)/x,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)/x,x, algorithm="maxima")
```

```
[Out] integrate(f^((b*x + a)^3*c)/x, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)/x,x, algorithm="fricas")
```

```
[Out] integral(f^(b^3*c*x^3 + 3*a*b^2*c*x^2 + 3*a^2*b*c*x + a^3*c)/x, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^3}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**3)/x,x)
```

```
[Out] Integral(f**(c*(a + b*x)**3)/x, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)/x,x, algorithm="giac")
```

```
[Out] integrate(f^((b*x + a)^3*c)/x, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{f^{c\,(a+b\,x)^3}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^3)/x,x)
[Out] int(f^(c*(a + b*x)^3)/x, x)
```

3.206 $\int \frac{f^{c(a+bx)^3}}{x^2} dx$

Optimal. Leaf size=133

$$-\frac{f^{c(a+bx)^3}}{x}-\frac{bc(a+bx)^2\Gamma\left(\frac{2}{3},-c(a+bx)^3\log(f)\right)\log(f)}{\left(-c(a+bx)^3\log(f)\right)^{2/3}}-\frac{abc(a+bx)\Gamma\left(\frac{1}{3},-c(a+bx)^3\log(f)\right)\log(f)}{\sqrt[3]{-c(a+bx)^3\log(f)}}+3a^2b$$

```
[Out] -f^(c*(b*x+a)^3)/x-b*c*(b*x+a)^2*GAMMA(2/3,-c*(b*x+a)^3*ln(f))*ln(f)/(-c*(b
*x+a)^3*ln(f))^(2/3)-a*b*c*(b*x+a)*GAMMA(1/3,-c*(b*x+a)^3*ln(f))*ln(f)/(-c*
(b*x+a)^3*ln(f))^(1/3)+3*a^2*b*c*ln(f)*Unintegrable(f^(c*(b*x+a)^3)/x,x)
```

Rubi [A]
time = 0.21, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{f^{c(a+bx)^3}}{x^2} dx$$

Verification is not applicable to the result.

```
[In] Int[f^(c*(a + b*x)^3)/x^2,x]
```

```
[Out] -(f^(c*(a + b*x)^3)/x) - (b*c*(a + b*x)^2*Gamma[2/3, -(c*(a + b*x)^3*Log[f]
)]*Log[f])/(-(c*(a + b*x)^3*Log[f]))^(2/3) - (a*b*c*(a + b*x)*Gamma[1/3, -(
c*(a + b*x)^3*Log[f])]*Log[f])/(-(c*(a + b*x)^3*Log[f]))^(1/3) + 3*a^2*b*c*
Log[f]*Defer[Int][f^(c*(a + b*x)^3)/x, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{f^{c(a+bx)^3}}{x^2} dx &= -\frac{f^{c(a+bx)^3}}{x}+(3bc\log(f))\int \frac{f^{c(a+bx)^3}(a+bx)^2}{x} dx\\
&= -\frac{f^{c(a+bx)^3}}{x}+(3bc\log(f))\int \left(abf^{c(a+bx)^3}+\frac{a^2f^{c(a+bx)^3}}{x}+bf^{c(a+bx)^3}(a+bx)\right) dx\\
&= -\frac{f^{c(a+bx)^3}}{x}+\left(3a^2bc\log(f)\right)\int \frac{f^{c(a+bx)^3}}{x} dx+\left(3b^2c\log(f)\right)\int f^{c(a+bx)^3}(a+bx)\,dx+\left(3ab^2\right.\\
&= -\frac{f^{c(a+bx)^3}}{x}-\frac{bc(a+bx)^2\Gamma\left(\frac{2}{3},-c(a+bx)^3\log(f)\right)\log(f)}{\left(-c(a+bx)^3\log(f)\right)^{2/3}}-\frac{abc(a+bx)\Gamma\left(\frac{1}{3},-c(a+bx)^3\right.}{\sqrt[3]{-c(a+bx)^3\log(}}
\end{aligned}$$

Mathematica [A]
time = 1.66, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^3}}{x^2} dx$$

Verification is not applicable to the result.

```
[In] Integrate[f^(c*(a + b*x)^3)/x^2,x]
[Out] Integrate[f^(c*(a + b*x)^3)/x^2, x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{f^{c(bx+a)^3}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^3)/x^2,x)
[Out] int(f^(c*(b*x+a)^3)/x^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)/x^2,x, algorithm="maxima")
[Out] integrate(f^((b*x + a)^3*c)/x^2, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)/x^2,x, algorithm="fricas")
[Out] integral(f^(b^3*c*x^3 + 3*a*b^2*c*x^2 + 3*a^2*b*c*x + a^3*c)/x^2, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^3}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**3)/x**2,x)
[Out] Integral(f**(c*(a + b*x)**3)/x**2, x)
```

Giac [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^((b*x + a)^3*c)/x^2, x)
```

Mupad [**A**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{f^{c\,(a+b\,x)^3}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^3)/x^2,x)
```

```
[Out] int(f^(c*(a + b*x)^3)/x^2, x)
```

3.207 $\int \frac{f^{c(a+bx)^3}}{x^3}\,dx$

Optimal. Leaf size=263

$$-\frac{f^{c(a+bx)^3}}{2x^2}-\frac{3a^2bcf^{c(a+bx)^3}\log(f)}{2x}-\frac{3a^2b^2c^2(a+bx)^2\Gamma\left(\frac{2}{3},-c(a+bx)^3\log(f)\right)\log^2(f)}{2\left(-c(a+bx)^3\log(f)\right)^{2/3}}-\frac{b^2c(a+bx)\Gamma\left(\frac{1}{3},-c(a\right.}{2\sqrt[3]{-c(a+}}$$

[Out] -1/2*f^(c*(b*x+a)^3)/x^2-3/2*a^2*b*c*f^(c*(b*x+a)^3)*ln(f)/x-3/2*a^2*b^2*c^2*(b*x+a)^2*GAMMA(2/3,-c*(b*x+a)^3*ln(f))*ln(f)^2/(-c*(b*x+a)^3*ln(f))^(2/3)-1/2*b^2*c*(b*x+a)*GAMMA(1/3,-c*(b*x+a)^3*ln(f))*ln(f)/(-c*(b*x+a)^3*ln(f))^(1/3)-3/2*a^3*b^2*c^2*(b*x+a)*GAMMA(1/3,-c*(b*x+a)^3*ln(f))*ln(f)^2/(-c*(b*x+a)^3*ln(f))^(1/3)+3*a*b^2*c*ln(f)*Unintegrable(f^(c*(b*x+a)^3)/x,x)+9/2*a^4*b^2*c^2*ln(f)^2*Unintegrable(f^(c*(b*x+a)^3)/x,x)

Rubi [A]
time = 0.33, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{f^{c(a+bx)^3}}{x^3}\,dx$$

Verification is not applicable to the result.

[In] Int[f^(c*(a + b*x)^3)/x^3,x]

[Out] -1/2*f^(c*(a + b*x)^3)/x^2 - (3*a^2*b*c*f^(c*(a + b*x)^3)*Log[f])/(2*x) - (3*a^2*b^2*c^2*(a + b*x)^2*Gamma[2/3, -(c*(a + b*x)^3*Log[f])]*Log[f]^2)/(2*(-(c*(a + b*x)^3*Log[f]))^(2/3)) - (b^2*c*(a + b*x)*Gamma[1/3, -(c*(a + b*x)^3*Log[f])]*Log[f])/(2*(-(c*(a + b*x)^3*Log[f]))^(1/3)) - (3*a^3*b^2*c^2*(a + b*x)*Gamma[1/3, -(c*(a + b*x)^3*Log[f])]*Log[f]^2)/(2*(-(c*(a + b*x)^3*Log[f]))^(1/3)) + 3*a*b^2*c*Log[f]*Defer[Int][f^(c*(a + b*x)^3)/x, x] + (9*a^4*b^2*c^2*Log[f]^2*Defer[Int][f^(c*(a + b*x)^3)/x, x])/2

Rubi steps

$$\int \frac{f^{c(a+bx)^3}}{x^3}\,dx = -\frac{f^{c(a+bx)^3}}{2x^2} + \frac{1}{2}(3bc\log(f))\int \frac{f^{c(a+bx)^3}(a+bx)^2}{x^2}\,dx$$
$$= -\frac{f^{c(a+bx)^3}}{2x^2} + \frac{1}{2}(3bc\log(f))\int \left(b^2 f^{c(a+bx)^3} + \frac{a^2 f^{c(a+bx)^3}}{x^2} + \frac{2abf^{c(a+bx)^3}}{x}\right)dx$$
$$= -\frac{f^{c(a+bx)^3}}{2x^2} + \frac{1}{2}\left(3a^2bc\log(f)\right)\int \frac{f^{c(a+bx)^3}}{x^2}\,dx + \left(3ab^2c\log(f)\right)\int \frac{f^{c(a+bx)^3}}{x}\,dx + \frac{1}{2}\left(3b^3c\log\right.$$
$$= -\frac{f^{c(a+bx)^3}}{2x^2} - \frac{3a^2bcf^{c(a+bx)^3}\log(f)}{2x} - \frac{b^2c(a+bx)\Gamma\left(\frac{1}{3}, -c(a+bx)^3\log(f)\right)\log(f)}{2\sqrt[3]{-c(a+bx)^3\log(f)}} + \left(3ab^2\right.$$
$$= -\frac{f^{c(a+bx)^3}}{2x^2} - \frac{3a^2bcf^{c(a+bx)^3}\log(f)}{2x} - \frac{b^2c(a+bx)\Gamma\left(\frac{1}{3}, -c(a+bx)^3\log(f)\right)\log(f)}{2\sqrt[3]{-c(a+bx)^3\log(f)}} + \left(3ab^2\right.$$
$$= -\frac{f^{c(a+bx)^3}}{2x^2} - \frac{3a^2bcf^{c(a+bx)^3}\log(f)}{2x} - \frac{b^2c(a+bx)\Gamma\left(\frac{1}{3}, -c(a+bx)^3\log(f)\right)\log(f)}{2\sqrt[3]{-c(a+bx)^3\log(f)}} + \left(3ab^2\right.$$
$$= -\frac{f^{c(a+bx)^3}}{2x^2} - \frac{3a^2bcf^{c(a+bx)^3}\log(f)}{2x} - \frac{3a^2b^2c^2(a+bx)^2\Gamma\left(\frac{2}{3}, -c(a+bx)^3\log(f)\right)\log^2(f)}{2\left(-c(a+bx)^3\log(f)\right)^{2/3}} -$$

Mathematica [A]
time = 1.17, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^3}}{x^3}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[f^(c*(a + b*x)^3)/x^3,x]
[Out] Integrate[f^(c*(a + b*x)^3)/x^3, x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{f^{c(bx+a)^3}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^3)/x^3,x)
[Out] int(f^(c*(b*x+a)^3)/x^3,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)/x^3,x, algorithm="maxima")
```

```
[Out] integrate(f^((b*x + a)^3*c)/x^3, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)/x^3,x, algorithm="fricas")
```

```
[Out] integral(f^(b^3*c*x^3 + 3*a*b^2*c*x^2 + 3*a^2*b*c*x + a^3*c)/x^3, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^3}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**3)/x**3,x)
```

```
[Out] Integral(f**(c*(a + b*x)**3)/x**3, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)/x^3,x, algorithm="giac")
```

```
[Out] integrate(f^((b*x + a)^3*c)/x^3, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{f^{c\,{\left(a+b\,x\right)}^3}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^3)/x^3,x)
```

```
[Out] int(f^(c*(a + b*x)^3)/x^3, x)
```

3.208 $\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x^4\,dx$

Optimal. Leaf size=183

$$\frac{2a^2e^{(a+bx)^3}}{b^5}-\frac{a^4(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b^5\sqrt[3]{-(a+bx)^3}}+\frac{4a^3(a+bx)^2\Gamma\left(\frac{2}{3},-(a+bx)^3\right)}{3b^5\left(-(a+bx)^3\right)^{2/3}}+\frac{4a(a+bx)^4\Gamma\left(\frac{4}{3},-(a+bx)^3\right)}{3b^5\left(-(a+bx)^3\right)^{4/3}}-($$

```
[Out] 2*a^2*exp((b*x+a)^3)/b^5-1/3*a^4*(b*x+a)*GAMMA(1/3,-(b*x+a)^3)/b^5/(-(b*x+a
)^3)^(1/3)+4/3*a^3*(b*x+a)^2*GAMMA(2/3,-(b*x+a)^3)/b^5/(-(b*x+a)^3)^(2/3)+4
/3*a*(b*x+a)^4*GAMMA(4/3,-(b*x+a)^3)/b^5/(-(b*x+a)^3)^(4/3)-1/3*(b*x+a)^5*G
AMMA(5/3,-(b*x+a)^3)/b^5/(-(b*x+a)^3)^(5/3)
```

Rubi [A]

time = 0.13, antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}=0.152$, Rules used = {2259, 2258, 2239, 2250, 2240}

$$-\frac{a^4(a+bx)\text{Gamma}\left(\frac{1}{3},-(a+bx)^3\right)}{3b^5\sqrt[3]{-(a+bx)^3}}+\frac{4a^3(a+bx)^2\text{Gamma}\left(\frac{2}{3},-(a+bx)^3\right)}{3b^5\left(-(a+bx)^3\right)^{2/3}}-\frac{(a+bx)^5\text{Gamma}\left(\frac{5}{3},-(a+bx)^3\right)}{3b^5\left(-(a+bx)^3\right)^{5/3}}+\frac{4a(a+bx)^4\text{Gamma}\left(\frac{4}{3},-(a+bx)^3\right)}{3b^5\left(-(a+bx)^3\right)^{4/3}}+\frac{2a^2e^{(a+bx)^3}}{b^5}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*x^4,x]
```

```
[Out] (2*a^2*E^(a + b*x)^3)/b^5 - (a^4*(a + b*x)*Gamma[1/3, -(a + b*x)^3])/(3*b^5
*(-(a + b*x)^3)^(1/3)) + (4*a^3*(a + b*x)^2*Gamma[2/3, -(a + b*x)^3])/(3*b^
5*(-(a + b*x)^3)^(2/3)) + (4*a*(a + b*x)^4*Gamma[4/3, -(a + b*x)^3])/(3*b^5
*(-(a + b*x)^3)^(4/3)) - ((a + b*x)^5*Gamma[5/3, -(a + b*x)^3])/(3*b^5*(-(a
 + b*x)^3)^(5/3))
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
```

```
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rule 2259

```
Int[(u_.)*(F_)^((a_.) + (b_.)*(v_)), x_Symbol] :> Int[u*F^(a + b*NormalizeP
owerOfLinear[v, x]), x] /; FreeQ[{F, a, b}, x] && PolynomialQ[u, x] && Powe
rOfLinearQ[v, x] &&  !PowerOfLinearMatchQ[v, x]
```

Rubi steps

$$\begin{aligned}\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x^4\,dx &= \int e^{(a+bx)^3}x^4\,dx\\ &= \int\left(\frac{a^4e^{(a+bx)^3}}{b^4}-\frac{4a^3e^{(a+bx)^3}(a+bx)}{b^4}+\frac{6a^2e^{(a+bx)^3}(a+bx)^2}{b^4}-\frac{4ae^{(a+bx)^3}(a+\right.\\ &= \frac{\int e^{(a+bx)^3}(a+bx)^4\,dx}{b^4}-\frac{(4a)\int e^{(a+bx)^3}(a+bx)^3\,dx}{b^4}+\frac{(6a^2)\int e^{(a+bx)^3}(a+bx)}{b^4}\\ &= \frac{2a^2e^{(a+bx)^3}}{b^5}-\frac{a^4(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b^5\sqrt[3]{-(a+bx)^3}}+\frac{4a^3(a+bx)^2\Gamma\left(\frac{2}{3},-(a+bx)^3\right)}{3b^5\left(-(a+bx)^3\right)^{2/3}}+\end{aligned}$$

Mathematica [A]
time = 0.41, size = 164, normalized size = 0.90

$$\frac{6a^2e^{(a+bx)^3}\left(-(a+bx)^3\right)^{2/3}-a^4(a+bx)\sqrt[3]{-(a+bx)^3}\,\Gamma\left(\frac{1}{3},-(a+bx)^3\right)+4a^3(a+bx)^2\Gamma\left(\frac{2}{3},-(a+bx)^3\right)-4a(a+bx)\sqrt[3]{-(a+bx)^3}\,\Gamma\left(\frac{4}{3},-(a+bx)^3\right)+(a+bx)^2\Gamma\left(\frac{5}{3},-(a+bx)^3\right)}{3b^5\left(-(a+bx)^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*x^4,x]
```

```
[Out] (6*a^2*E^(a + b*x)^3*(-(a + b*x)^3)^(2/3) - a^4*(a + b*x)*(-(a + b*x)^3)^(1
/3)*Gamma[1/3, -(a + b*x)^3] + 4*a^3*(a + b*x)^2*Gamma[2/3, -(a + b*x)^3] -
 4*a*(a + b*x)*(-(a + b*x)^3)^(1/3)*Gamma[4/3, -(a + b*x)^3] + (a + b*x)^2*
Gamma[5/3, -(a + b*x)^3])/(3*b^5*(-(a + b*x)^3)^(2/3))
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int e^{b^3x^3+3a\,b^2x^2+3a^2bx+a^3}x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^4,x)
```

```
[Out] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^4,x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^4,x, algorithm="maxima")
```

```
[Out] integrate(x^4*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

Fricas [A]
time = 0.08, size = 158, normalized size = 0.86

$$-\frac{2\,(6\,a^3+1)(-b^3)^{\frac{1}{3}}\,b\Gamma\left(\frac{2}{3},-b^3x^3-3\,ab^2x^2-3\,a^2bx-a^3\right)-(3\,a^4+4\,a)(-b^3)^{\frac{2}{3}}\,\Gamma\left(\frac{1}{3},-b^3x^3-3\,ab^2x^2-3\,a^2bx-a^3\right)-3\,(b^4x^2-2\,ab^3x+3\,a^2b^2)e^{(b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3)}}{9\,b^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^4,x, algorithm="fricas")
```

```
[Out] -1/9*(2*(6*a^3 + 1)*(-b^3)^(1/3)*b*gamma(2/3, -b^3*x^3 - 3*a*b^2*x^2 - 3*a^
2*b*x - a^3) - (3*a^4 + 4*a)*(-b^3)^(2/3)*gamma(1/3, -b^3*x^3 - 3*a*b^2*x^2
 - 3*a^2*b*x - a^3) - 3*(b^4*x^2 - 2*a*b^3*x + 3*a^2*b^2)*e^(b^3*x^3 + 3*a*
b^2*x^2 + 3*a^2*b*x + a^3))/b^7
```

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

$$e^{a^3}\int x^4e^{b^3x^3}e^{3ab^2x^2}e^{3a^2bx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b**3*x**3+3*a*b**2*x**2+3*a**2*b*x+a**3)*x**4,x)
```

```
[Out] exp(a**3)*Integral(x**4*exp(b**3*x**3)*exp(3*a*b**2*x**2)*exp(3*a**2*b*x),
x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^4,x, algorithm="giac")
[Out] integrate(x^4*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int x^4\,\mathrm{e}^{a^3+3\,a^2\,b\,x+3\,a\,b^2\,x^2+b^3\,x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x),x)
[Out] int(x^4*exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x), x)
```

3.209 $\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x^3\,dx$

Optimal. Leaf size=138

$$-\frac{ae^{(a+bx)^3}}{b^4}+\frac{a^3(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b^4\sqrt[3]{-(a+bx)^3}}-\frac{a^2(a+bx)^2\Gamma\left(\frac{2}{3},-(a+bx)^3\right)}{b^4\left(-(a+bx)^3\right)^{2/3}}-\frac{(a+bx)^4\Gamma\left(\frac{4}{3},-(a+bx)^3\right)}{3b^4\left(-(a+bx)^3\right)^{4/3}}$$

```
[Out] -a*exp((b*x+a)^3)/b^4+1/3*a^3*(b*x+a)*GAMMA(1/3,-(b*x+a)^3)/b^4/(-(b*x+a)^3
)^(1/3)-a^2*(b*x+a)^2*GAMMA(2/3,-(b*x+a)^3)/b^4/(-(b*x+a)^3)^(2/3)-1/3*(b*x
+a)^4*GAMMA(4/3,-(b*x+a)^3)/b^4/(-(b*x+a)^3)^(4/3)
```

Rubi [A]
time = 0.11, antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.152$, Rules used = {2259, 2258, 2239, 2250, 2240}

$$\frac{a^3(a+bx)\text{Gamma}\left(\frac{1}{3},-(a+bx)^3\right)}{3b^4\sqrt[3]{-(a+bx)^3}}-\frac{a^2(a+bx)^2\text{Gamma}\left(\frac{2}{3},-(a+bx)^3\right)}{b^4\left(-(a+bx)^3\right)^{2/3}}-\frac{(a+bx)^4\text{Gamma}\left(\frac{4}{3},-(a+bx)^3\right)}{3b^4\left(-(a+bx)^3\right)^{4/3}}-\frac{ae^{(a+bx)^3}}{b^4}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*x^3,x]
```

```
[Out] -((a*E^(a + b*x)^3)/b^4) + (a^3*(a + b*x)*Gamma[1/3, -(a + b*x)^3])/(3*b^4*
(-(a + b*x)^3)^(1/3)) - (a^2*(a + b*x)^2*Gamma[2/3, -(a + b*x)^3])/(b^4*(-(
a + b*x)^3)^(2/3)) - ((a + b*x)^4*Gamma[4/3, -(a + b*x)^3])/(3*b^4*(-(a + b
*x)^3)^(4/3))
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rule 2259

```
Int[(u_.)*(F_)^((a_.) + (b_.)*(v_)), x_Symbol] :> Int[u*F^(a + b*NormalizeP
owerOfLinear[v, x]), x] /; FreeQ[{F, a, b}, x] && PolynomialQ[u, x] && Powe
rOfLinearQ[v, x] &&  !PowerOfLinearMatchQ[v, x]
```

Rubi steps

$$\begin{aligned}\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x^3\,dx &= \int e^{(a+bx)^3}x^3\,dx\\ &= \int \left(-\frac{a^3e^{(a+bx)^3}}{b^3}+\frac{3a^2e^{(a+bx)^3}(a+bx)}{b^3}-\frac{3ae^{(a+bx)^3}(a+bx)^2}{b^3}+\frac{e^{(a+bx)^3}(a+b\right.\\ &= \frac{\int e^{(a+bx)^3}(a+bx)^3\,dx}{b^3}-\frac{(3a)\int e^{(a+bx)^3}(a+bx)^2\,dx}{b^3}+\frac{(3a^2)\int e^{(a+bx)^3}(a+bx)}{b^3}\\ &= -\frac{ae^{(a+bx)^3}}{b^4}+\frac{a^3(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b^4\sqrt[3]{-(a+bx)^3}}-\frac{a^2(a+bx)^2\Gamma\left(\frac{2}{3},-(a+bx)^3\right)}{b^4\left(-(a+bx)^3\right)^{2/3}}-\end{aligned}$$

Mathematica [A]
time = 0.37, size = 138, normalized size = 1.00

$$-\frac{ae^{(a+bx)^3}}{b^4}+\frac{a^3(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b^4\sqrt[3]{-(a+bx)^3}}-\frac{a^2(a+bx)^2\Gamma\left(\frac{2}{3},-(a+bx)^3\right)}{b^4\left(-(a+bx)^3\right)^{2/3}}-\frac{(a+bx)^4\Gamma\left(\frac{4}{3},-(a+bx)^3\right)}{3b^4\left(-(a+bx)^3\right)^{4/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*x^3,x]
```

```
[Out] -((a*E^(a + b*x)^3)/b^4) + (a^3*(a + b*x)*Gamma[1/3, -(a + b*x)^3])/(3*b^4*
(-(a + b*x)^3)^(1/3)) - (a^2*(a + b*x)^2*Gamma[2/3, -(a + b*x)^3])/(b^4*(-(
a + b*x)^3)^(2/3)) - ((a + b*x)^4*Gamma[4/3, -(a + b*x)^3])/(3*b^4*(-(a + b
*x)^3)^(4/3))
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int e^{b^3x^3+3a\,b^2x^2+3a^2bx+a^3}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^3,x)
```

```
[Out] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^3,x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^3,x, algorithm="maxima")
```

```
[Out] integrate(x^3*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

Fricas [A]
time = 0.08, size = 141, normalized size = 1.02

$$\frac{9\,(-b^3)^{\frac{1}{3}}\,a^2b\Gamma\left(\frac{2}{3},-b^3x^3-3\,ab^2x^2-3\,a^2bx-a^3\right)-(3\,a^3+1)(-b^3)^{\frac{2}{3}}\,\Gamma\left(\frac{1}{3},-b^3x^3-3\,ab^2x^2-3\,a^2bx-a^3\right)+3\,(b^3x-2\,ab^2)e^{(b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3)}}{9\,b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^3,x, algorithm="fricas")
```

```
[Out] 1/9*(9*(-b^3)^(1/3)*a^2*b*gamma(2/3, -b^3*x^3 - 3*a*b^2*x^2 - 3*a^2*b*x - a
^3) - (3*a^3 + 1)*(-b^3)^(2/3)*gamma(1/3, -b^3*x^3 - 3*a*b^2*x^2 - 3*a^2*b*
x - a^3) + 3*(b^3*x - 2*a*b^2)*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))
/b^6
```

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

$$e^{a^3}\int x^3e^{b^3x^3}e^{3ab^2x^2}e^{3a^2bx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b**3*x**3+3*a*b**2*x**2+3*a**2*b*x+a**3)*x**3,x)
```

```
[Out] exp(a**3)*Integral(x**3*exp(b**3*x**3)*exp(3*a*b**2*x**2)*exp(3*a**2*b*x),
x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^3,x, algorithm="giac")
[Out] integrate(x^3*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int x^3\,\mathrm{e}^{a^3+3\,a^2\,b\,x+3\,a\,b^2\,x^2+b^3\,x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x),x)
[Out] int(x^3*exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x), x)
```

3.210 $\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x^2\,dx$

Optimal. Leaf size=99

$$\frac{e^{(a+bx)^3}}{3b^3}-\frac{a^2(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b^3\sqrt[3]{-(a+bx)^3}}+\frac{2a(a+bx)^2\Gamma\left(\frac{2}{3},-(a+bx)^3\right)}{3b^3\left(-(a+bx)^3\right)^{2/3}}$$

```
[Out] 1/3*exp((b*x+a)^3)/b^3-1/3*a^2*(b*x+a)*GAMMA(1/3,-(b*x+a)^3)/b^3/(-(b*x+a)^
3)^(1/3)+2/3*a*(b*x+a)^2*GAMMA(2/3,-(b*x+a)^3)/b^3/(-(b*x+a)^3)^(2/3)
```

Rubi [A]
time = 0.08, antiderivative size = 99, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.152$, Rules used = {2259, 2258, 2239, 2250, 2240}

$$-\frac{a^2(a+bx)\text{Gamma}\left(\frac{1}{3},-(a+bx)^3\right)}{3b^3\sqrt[3]{-(a+bx)^3}}+\frac{2a(a+bx)^2\text{Gamma}\left(\frac{2}{3},-(a+bx)^3\right)}{3b^3\left(-(a+bx)^3\right)^{2/3}}+\frac{e^{(a+bx)^3}}{3b^3}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*x^2,x]
```

```
[Out] E^(a + b*x)^3/(3*b^3) - (a^2*(a + b*x)*Gamma[1/3, -(a + b*x)^3])/(3*b^3*(-(
a + b*x)^3)^(1/3)) + (2*a*(a + b*x)^2*Gamma[2/3, -(a + b*x)^3])/(3*b^3*(-(a
 + b*x)^3)^(2/3))
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rule 2259

```
Int[(u_.)*(F_)^((a_.) + (b_.)*(v_)), x_Symbol] :> Int[u*F^(a + b*NormalizeP
owerOfLinear[v, x]), x] /; FreeQ[{F, a, b}, x] && PolynomialQ[u, x] && Powe
rOfLinearQ[v, x] &&  !PowerOfLinearMatchQ[v, x]
```

Rubi steps

$$\begin{aligned}
\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x^2\,dx &= \int e^{(a+bx)^3}x^2\,dx \\
&= \int \left(\frac{a^2e^{(a+bx)^3}}{b^2}-\frac{2ae^{(a+bx)^3}(a+bx)}{b^2}+\frac{e^{(a+bx)^3}(a+bx)^2}{b^2}\right)dx \\
&= \frac{\int e^{(a+bx)^3}(a+bx)^2\,dx}{b^2}-\frac{(2a)\int e^{(a+bx)^3}(a+bx)\,dx}{b^2}+\frac{a^2\int e^{(a+bx)^3}\,dx}{b^2} \\
&= \frac{e^{(a+bx)^3}}{3b^3}-\frac{a^2(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b^3\sqrt[3]{-(a+bx)^3}}+\frac{2a(a+bx)^2\Gamma\left(\frac{2}{3},-(a+bx)^3\right)}{3b^3\left(-(a+bx)^3\right)^{2/3}}
\end{aligned}$$

Mathematica [A]
time = 0.34, size = 89, normalized size = 0.90

$$\frac{e^{(a+bx)^3}-\frac{a^2(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{\sqrt[3]{-(a+bx)^3}}+\frac{2a(a+bx)^2\Gamma\left(\frac{2}{3},-(a+bx)^3\right)}{\left(-(a+bx)^3\right)^{2/3}}}{3b^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*x^2,x]
```

```
[Out] (E^(a + b*x)^3 - (a^2*(a + b*x)*Gamma[1/3, -(a + b*x)^3])/(-(a + b*x)^3)^(1
/3) + (2*a*(a + b*x)^2*Gamma[2/3, -(a + b*x)^3])/(-(a + b*x)^3)^(2/3))/(3*b
^3)
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int e^{b^3x^3+3a\,b^2x^2+3a^2bx+a^3}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^2,x)
```

```
[Out] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^2,x)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^2,x, algorithm="maxima")
```

```
[Out] integrate(x^2*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

Fricas [**A**]
time = 0.09, size = 124, normalized size = 1.25

$$\frac{(-b^3)^{\frac{2}{3}}\, a^2\Gamma\left(\frac{1}{3}, -b^3x^3 - 3\,ab^2x^2 - 3\,a^2bx - a^3\right) - 2\,(-b^3)^{\frac{1}{3}}\, ab\Gamma\left(\frac{2}{3}, -b^3x^3 - 3\,ab^2x^2 - 3\,a^2bx - a^3\right) + b^2e^{\left(b^3x^3 + 3\,ab^2x^2 + 3\,a^2bx + a^3\right)}}{3\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^2,x, algorithm="fricas")
```

```
[Out] 1/3*((-b^3)^(2/3)*a^2*gamma(1/3, -b^3*x^3 - 3*a*b^2*x^2 - 3*a^2*b*x - a^3)
- 2*(-b^3)^(1/3)*a*b*gamma(2/3, -b^3*x^3 - 3*a*b^2*x^2 - 3*a^2*b*x - a^3) +
 b^2*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))/b^5
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$e^{a^3}\int x^2e^{b^3x^3}e^{3ab^2x^2}e^{3a^2bx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b**3*x**3+3*a*b**2*x**2+3*a**2*b*x+a**3)*x**2,x)
```

```
[Out] exp(a**3)*Integral(x**2*exp(b**3*x**3)*exp(3*a*b**2*x**2)*exp(3*a**2*b*x),
x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^2,x, algorithm="giac")
```

```
[Out] integrate(x^2*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.01

$$\int x^2 e^{a^3+3 a^2 b x+3 a b^2 x^2+b^3 x^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x),x)
[Out] int(x^2*exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x), x)
```

3.211 $\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x\,dx$

Optimal. Leaf size=80

$$\frac{a(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b^2\sqrt[3]{-(a+bx)^3}}-\frac{(a+bx)^2\Gamma\left(\frac{2}{3},-(a+bx)^3\right)}{3b^2\left(-(a+bx)^3\right)^{2/3}}$$

```
[Out] 1/3*a*(b*x+a)*GAMMA(1/3,-(b*x+a)^3)/b^2/(-(b*x+a)^3)^(1/3)-1/3*(b*x+a)^2*GA
MMA(2/3,-(b*x+a)^3)/b^2/(-(b*x+a)^3)^(2/3)
```

Rubi [A]

time = 0.05, antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.129$, Rules used = {2259, 2258, 2239, 2250}

$$\frac{a(a+bx)\text{Gamma}\left(\frac{1}{3},-(a+bx)^3\right)}{3b^2\sqrt[3]{-(a+bx)^3}}-\frac{(a+bx)^2\text{Gamma}\left(\frac{2}{3},-(a+bx)^3\right)}{3b^2\left(-(a+bx)^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*x,x]
```

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

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rule 2259

```
Int[(u_.)*(F_)^((a_.) + (b_.)*(v_)), x_Symbol] :> Int[u*F^(a + b*NormalizeP
owerOfLinear[v, x]), x] /; FreeQ[{F, a, b}, x] && PolynomialQ[u, x] && Powe
```

```
rOfLinearQ[v, x] &&  !PowerOfLinearMatchQ[v, x]
```

Rubi steps

$$\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x\,dx = \int e^{(a+bx)^3}x\,dx$$
$$= \int \left(-\frac{ae^{(a+bx)^3}}{b}+\frac{e^{(a+bx)^3}(a+bx)}{b}\right)dx$$
$$= \frac{\int e^{(a+bx)^3}(a+bx)\,dx}{b}-\frac{a\int e^{(a+bx)^3}\,dx}{b}$$
$$= \frac{a(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b^2\sqrt[3]{-(a+bx)^3}}-\frac{(a+bx)^2\Gamma\left(\frac{2}{3},-(a+bx)^3\right)}{3b^2\left(-(a+bx)^3\right)^{2/3}}$$

Mathematica [A]
time = 0.29, size = 74, normalized size = 0.92

$$\frac{(a+bx)\left(a\sqrt[3]{-(a+bx)^3}\,\Gamma\left(\frac{1}{3},-(a+bx)^3\right)-(a+bx)\Gamma\left(\frac{2}{3},-(a+bx)^3\right)\right)}{3b^2\left(-(a+bx)^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*x,x]
[Out] ((a + b*x)*(a*(-(a + b*x)^3)^(1/3)*Gamma[1/3, -(a + b*x)^3] - (a + b*x)*Gam
ma[2/3, -(a + b*x)^3]))/(3*b^2*(-(a + b*x)^3)^(2/3))
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int e^{b^3x^3+3a\,b^2x^2+3a^2bx+a^3}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x,x)
[Out] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x,x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x,x, algorithm="maxima")
```

```
[Out] integrate(x*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

Fricas [A]
time = 0.09, size = 89, normalized size = 1.11

$$-\frac{\left(-b^{3}\right)^{\frac{2}{3}} a\Gamma\left(\frac{1}{3}, -b^{3}x^{3} - 3\,ab^{2}x^{2} - 3\,a^{2}bx - a^{3}\right) - \left(-b^{3}\right)^{\frac{1}{3}} b\Gamma\left(\frac{2}{3}, -b^{3}x^{3} - 3\,ab^{2}x^{2} - 3\,a^{2}bx - a^{3}\right)}{3\,b^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x,x, algorithm="fricas")
```

```
[Out] -1/3*((-b^3)^(2/3)*a*gamma(1/3, -b^3*x^3 - 3*a*b^2*x^2 - 3*a^2*b*x - a^3) -
 (-b^3)^(1/3)*b*gamma(2/3, -b^3*x^3 - 3*a*b^2*x^2 - 3*a^2*b*x - a^3))/b^4
```

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

$$e^{a^{3}} \int xe^{b^{3}x^{3}}e^{3ab^{2}x^{2}}e^{3a^{2}bx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b**3*x**3+3*a*b**2*x**2+3*a**2*b*x+a**3)*x,x)
```

```
[Out] exp(a**3)*Integral(x*exp(b**3*x**3)*exp(3*a*b**2*x**2)*exp(3*a**2*b*x), x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x,x, algorithm="giac")
```

```
[Out] integrate(x*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int x\,\mathrm{e}^{a^3+3\,a^2\,b\,x+3\,a\,b^2\,x^2+b^3\,x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x),x)
```

```
[Out] int(x*exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x), x)
```

3.212 $\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx$

Optimal. Leaf size=38

$$-\frac{(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b\sqrt[3]{-(a+bx)^3}}$$

```
[Out] -1/3*(b*x+a)*GAMMA(1/3,-(b*x+a)^3)/b/(-(b*x+a)^3)^(1/3)
```

Rubi [A]
time = 0.01, antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.069, Rules used = {2259, 2239}

$$-\frac{(a+bx)\text{Gamma}\left(\frac{1}{3},-(a+bx)^3\right)}{3b\sqrt[3]{-(a+bx)^3}}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3),x]
```

```
[Out] -1/3*((a + b*x)*Gamma[1/3, -(a + b*x)^3])/(b*(-(a + b*x)^3)^(1/3))
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2259

```
Int[(u_.)*(F_)^((a_.) + (b_.)*(v_)), x_Symbol] :> Int[u*F^(a + b*NormalizeP
owerOfLinear[v, x]), x] /; FreeQ[{F, a, b}, x] && PolynomialQ[u, x] && Powe
rOfLinearQ[v, x] &&  !PowerOfLinearMatchQ[v, x]
```

Rubi steps

$$\begin{aligned}\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx &= \int e^{(a+bx)^3}\,dx\\ &= -\frac{(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b\sqrt[3]{-(a+bx)^3}}\end{aligned}$$

Mathematica [A]
time = 0.04, size = 38, normalized size = 1.00

$$-\frac{(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b\sqrt[3]{-(a+bx)^3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3),x]
[Out] -1/3*((a + b*x)*Gamma[1/3, -(a + b*x)^3])/(b*(-(a + b*x)^3)^(1/3))
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \mathrm{e}^{b^{3} x^{3}+3 a\, b^{2} x^{2}+3 a^{2} b x+a^{3}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3),x)
[Out] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3),x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3),x, algorithm="maxima")
[Out] integrate(e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

Fricas [A]
time = 0.11, size = 44, normalized size = 1.16

$$\frac{\left(-b^{3}\right)^{\frac{2}{3}} \Gamma\left(\frac{1}{3}, -b^{3} x^{3}-3\, a b^{2} x^{2}-3\, a^{2} b x-a^{3}\right)}{3\, b^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3),x, algorithm="fricas")
[Out] 1/3*(-b^3)^(2/3)*gamma(1/3, -b^3*x^3 - 3*a*b^2*x^2 - 3*a^2*b*x - a^3)/b^3
```

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

$$e^{a^{3}} \int e^{b^{3} x^{3}} e^{3 a b^{2} x^{2}} e^{3 a^{2} b x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b**3*x**3+3*a*b**2*x**2+3*a**2*b*x+a**3),x)
[Out] exp(a**3)*Integral(exp(b**3*x**3)*exp(3*a*b**2*x**2)*exp(3*a**2*b*x), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3),x, algorithm="giac")
```

```
[Out] integrate(e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.03

$$\int e^{a^3+3\,a^2\,b\,x+3\,a\,b^2\,x^2+b^3\,x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x),x)
```

```
[Out] int(exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x), x)
```

3.213 $\int \frac{e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}}{x}\,dx$

Optimal. Leaf size=36

$$\text{Int}\left(\frac{e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}}{x},x\right)$$

```
[Out] CannotIntegrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)/x,x)
```

Rubi [A]
time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}}{x}\,dx$$

Verification is not applicable to the result.

```
[In] Int[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)/x,x]
[Out] Defer[Int][E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)/x, x]
```

Rubi steps

$$\int \frac{e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}}{x}\,dx = \int \frac{e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}}{x}\,dx$$

Mathematica [A]
time = 0.42, size = 0, normalized size = 0.00

$$\int \frac{e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}}{x}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)/x,x]
[Out] Integrate[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)/x, x]
```

Maple [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{e}^{b^3x^3+3a\,b^2x^2+3a^2bx+a^3}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)/x,x)
```

```
[Out] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)/x,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)/x,x, algorithm="maxima")
```

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

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)/x,x, algorithm="fricas")
```

```
[Out] integral(e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)/x, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$e^{a^{3}} \int \frac{e^{b^{3} x^{3}} e^{3 a b^{2} x^{2}} e^{3 a^{2} b x}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b**3*x**3+3*a*b**2*x**2+3*a**2*b*x+a**3)/x,x)
```

```
[Out] exp(a**3)*Integral(exp(b**3*x**3)*exp(3*a*b**2*x**2)*exp(3*a**2*b*x)/x, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)/x,x, algorithm="giac")
```

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

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{e^{a^3+3\,a^2\,b\,x+3\,a\,b^2\,x^2+b^3\,x^3}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x)/x,x)
[Out] int(exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x)/x, x)
```

3.214 $\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x^m\,dx$

Optimal. Leaf size=36

$$\mathrm{Int}\left(e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x^m,x\right)$$

[Out] CannotIntegrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^m,x)

Rubi [A]
time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x^m\,dx$$

Verification is not applicable to the result.

[In] Int[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*x^m,x]

[Out] Defer[Int][E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*x^m, x]

Rubi steps

$$\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x^m\,dx=\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x^m\,dx$$

Mathematica [A]
time = 0.14, size = 0, normalized size = 0.00

$$\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x^m\,dx$$

Verification is not applicable to the result.

[In] Integrate[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*x^m,x]

[Out] Integrate[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*x^m, x]

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \mathrm{e}^{b^3x^3+3a\,b^2x^2+3a^2bx+a^3}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^m,x)
```

```
[Out] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^m,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^m,x, algorithm="maxima")
```

```
[Out] integrate(x^m*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^m,x, algorithm="fricas")
```

```
[Out] integral(x^m*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$e^{a^{3}} \int x^{m} e^{b^{3} x^{3}} e^{3 a b^{2} x^{2}} e^{3 a^{2} b x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b**3*x**3+3*a*b**2*x**2+3*a**2*b*x+a**3)*x**m,x)
```

```
[Out] exp(a**3)*Integral(x**m*exp(b**3*x**3)*exp(3*a*b**2*x**2)*exp(3*a**2*b*x),
x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^m,x, algorithm="giac")
```

```
[Out] integrate(x^m*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int x^m \,\mathrm{e}^{a^3+3\,a^2\,b\,x+3\,a\,b^2\,x^2+b^3\,x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x),x)
[Out] int(x^m*exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x), x)
```

3.215 $\int e^{\sqrt{5+3x}}\,dx$

Optimal. Leaf size=40

$$-\frac{2}{3}e^{\sqrt{5+3x}}+\frac{2}{3}e^{\sqrt{5+3x}}\sqrt{5+3x}$$

```
[Out] -2/3*exp((5+3*x)^(1/2))+2/3*exp((5+3*x)^(1/2))*(5+3*x)^(1/2)
```

Rubi [A]
time = 0.01, antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.273$, Rules used = {2238, 2207, 2225}

$$\frac{2}{3}e^{\sqrt{3x+5}}\sqrt{3x+5}-\frac{2}{3}e^{\sqrt{3x+5}}$$

Antiderivative was successfully verified.

```
[In] Int[E^Sqrt[5 + 3*x],x]
```

```
[Out] (-2*E^Sqrt[5 + 3*x])/3 + (2*E^Sqrt[5 + 3*x]*Sqrt[5 + 3*x])/3
```

Rule 2207

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[(c + d*x)^m*((b*F^(g*(e + f*x)))^n/(f*g*n*Log[F])),
x] - Dist[d*(m/(f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !TrueQ[$UseGamma]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2238

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> With[{k =
Denominator[n]}, Dist[k/d, Subst[Int[x^(k - 1)*F^(a + b*x^(k*n)), x], x, (c
 + d*x)^(1/k)], x]] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] &&  !Inte
gerQ[n]
```

Rubi steps

$$\begin{aligned}\int e^{\sqrt{5+3x}}\,dx &= \frac{2}{3}\text{Subst}\left(\int e^x x\,dx, x, \sqrt{5+3x}\right)\\ &= \frac{2}{3}e^{\sqrt{5+3x}}\sqrt{5+3x} - \frac{2}{3}\text{Subst}\left(\int e^x\,dx, x, \sqrt{5+3x}\right)\\ &= -\frac{2}{3}e^{\sqrt{5+3x}} + \frac{2}{3}e^{\sqrt{5+3x}}\sqrt{5+3x}\end{aligned}$$

Mathematica [A]
time = 0.02, size = 26, normalized size = 0.65

$$\frac{2}{3}e^{\sqrt{5+3x}}\left(-1+\sqrt{5+3x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^Sqrt[5 + 3*x],x]
[Out] (2*E^Sqrt[5 + 3*x]*(-1 + Sqrt[5 + 3*x]))/3
```

Maple [A]
time = 0.02, size = 29, normalized size = 0.72

method	result	size
derivativedivides	$-\frac{2\,\mathrm{e}^{\sqrt{5+3x}}}{3}+\frac{2\,\mathrm{e}^{\sqrt{5+3x}}\sqrt{5+3x}}{3}$	29
default	$-\frac{2\,\mathrm{e}^{\sqrt{5+3x}}}{3}+\frac{2\,\mathrm{e}^{\sqrt{5+3x}}\sqrt{5+3x}}{3}$	29

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((5+3*x)^(1/2)),x,method=_RETURNVERBOSE)
[Out] -2/3*exp((5+3*x)^(1/2))+2/3*exp((5+3*x)^(1/2))*(5+3*x)^(1/2)
```

Maxima [A]
time = 0.28, size = 19, normalized size = 0.48

$$\frac{2}{3}\left(\sqrt{3\,x+5}-1\right)e^{\left(\sqrt{3\,x+5}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((5+3*x)^(1/2)),x, algorithm="maxima")
[Out] 2/3*(sqrt(3*x + 5) - 1)*e^(sqrt(3*x + 5))
```

Fricas [A]
time = 0.42, size = 19, normalized size = 0.48

$$\frac{2}{3} \left(\sqrt{3 x+5}-1\right) e^{\left(\sqrt{3 x+5}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((5+3*x)^(1/2)),x, algorithm="fricas")
```

```
[Out] 2/3*(sqrt(3*x + 5) - 1)*e^(sqrt(3*x + 5))
```

Sympy [A]
time = 0.07, size = 34, normalized size = 0.85

$$\frac{2 \sqrt{3x+5}\, e^{\sqrt{3x+5}}}{3}-\frac{2 e^{\sqrt{3x+5}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((5+3*x)**(1/2)),x)
```

```
[Out] 2*sqrt(3*x + 5)*exp(sqrt(3*x + 5))/3 - 2*exp(sqrt(3*x + 5))/3
```

Giac [A]
time = 2.37, size = 19, normalized size = 0.48

$$\frac{2}{3} \left(\sqrt{3 x+5}-1\right) e^{\left(\sqrt{3 x+5}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((5+3*x)^(1/2)),x, algorithm="giac")
```

```
[Out] 2/3*(sqrt(3*x + 5) - 1)*e^(sqrt(3*x + 5))
```

Mupad [B]
time = 0.09, size = 19, normalized size = 0.48

$$\frac{2\, \mathrm{e}^{\sqrt{3 x+5}} \left(\sqrt{3 x+5}-1\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((3*x + 5)^(1/2)),x)
```

```
[Out] (2*exp((3*x + 5)^(1/2))*((3*x + 5)^(1/2) - 1))/3
```

3.216 $\int f^{\frac{c}{a+bx}} x^4 \, dx$

Optimal. Leaf size=291

$$\frac{a^4 f^{\frac{c}{a+bx}}(a+bx)}{b^5}-\frac{2a^3 f^{\frac{c}{a+bx}}(a+bx)^2}{b^5}+\frac{2a^2 f^{\frac{c}{a+bx}}(a+bx)^3}{b^5}-\frac{2a^3 c f^{\frac{c}{a+bx}}(a+bx)\log(f)}{b^5}+\frac{a^2 c f^{\frac{c}{a+bx}}(a+bx)^2\log(f)}{b^5}$$

```
[Out] a^4*f^(c/(b*x+a))*(b*x+a)/b^5-2*a^3*f^(c/(b*x+a))*(b*x+a)^2/b^5+2*a^2*f^(c/
(b*x+a))*(b*x+a)^3/b^5-2*a^3*c*f^(c/(b*x+a))*(b*x+a)*ln(f)/b^5+a^2*c*f^(c/(
b*x+a))*(b*x+a)^2*ln(f)/b^5-a^4*c*Ei(c*ln(f)/(b*x+a))*ln(f)/b^5+a^2*c^2*f^(
c/(b*x+a))*(b*x+a)*ln(f)^2/b^5+2*a^3*c^2*Ei(c*ln(f)/(b*x+a))*ln(f)^2/b^5-a^
2*c^3*Ei(c*ln(f)/(b*x+a))*ln(f)^3/b^5-4*a*(b*x+a)^4*Ei(5,-c*ln(f)/(b*x+a))/
b^5+(b*x+a)^5*Ei(6,-c*ln(f)/(b*x+a))/b^5
```

Rubi [A]
time = 0.22, antiderivative size = 291, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {2258, 2237, 2241, 2245, 2250}

$$-\frac{c^5 \log^5(f)\text{Gamma}\left(-5,-\frac{c\log(f)}{a+bx}\right)}{b^5}-\frac{4ac^4\log^4(f)\text{Gamma}\left(-4,-\frac{c\log(f)}{a+bx}\right)}{b^5}-\frac{a^4 c\log(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{b^5}+\frac{a^4(a+bx)f^{\frac{c}{a+bx}}}{b^5}+\frac{2a^3c^2\log^2(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{b^5}-\frac{2a^3(a+bx)^2 f^{\frac{c}{a+bx}}}{b^5}-\frac{2a^3c\log(f)(a+bx)f^{\frac{c}{a+bx}}}{b^5}-\frac{a^2c^3\log^3(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{b^5}+\frac{a^2c^2\log^2(f)(a+bx)f^{\frac{c}{a+bx}}}{b^5}+\frac{2a^2(a+bx)^3 f^{\frac{c}{a+bx}}}{b^5}+\frac{a^2c\log(f)(a+bx)^2 f^{\frac{c}{a+bx}}}{b^5}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x))*x^4,x]
```

```
[Out] (a^4*f^(c/(a + b*x))*(a + b*x))/b^5 - (2*a^3*f^(c/(a + b*x))*(a + b*x)^2)/b
^5 + (2*a^2*f^(c/(a + b*x))*(a + b*x)^3)/b^5 - (2*a^3*c*f^(c/(a + b*x))*(a
+ b*x)*Log[f])/b^5 + (a^2*c*f^(c/(a + b*x))*(a + b*x)^2*Log[f])/b^5 - (a^4*
c*ExpIntegralEi[(c*Log[f])/(a + b*x)]*Log[f])/b^5 + (a^2*c^2*f^(c/(a + b*x)
)*(a + b*x)*Log[f]^2)/b^5 + (2*a^3*c^2*ExpIntegralEi[(c*Log[f])/(a + b*x)]*
Log[f]^2)/b^5 - (a^2*c^3*ExpIntegralEi[(c*Log[f])/(a + b*x)]*Log[f]^3)/b^5
- (4*a*c^4*Gamma[-4, -((c*Log[f])/(a + b*x))]*Log[f]^4)/b^5 - (c^5*Gamma[-5
, -((c*Log[f])/(a + b*x))]*Log[f]^5)/b^5
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{\frac{c}{a+bx}}x^4\,dx = \int \left(\frac{a^4 f^{\frac{c}{a+bx}}}{b^4} - \frac{4a^3 f^{\frac{c}{a+bx}}(a+bx)}{b^4} + \frac{6a^2 f^{\frac{c}{a+bx}}(a+bx)^2}{b^4} - \frac{4a f^{\frac{c}{a+bx}}(a+bx)^3}{b^4} + \frac{f^{\frac{c}{a+bx}}(a+b\right.$$

$$= \frac{\int f^{\frac{c}{a+bx}}(a+bx)^4\,dx}{b^4} - \frac{(4a)\int f^{\frac{c}{a+bx}}(a+bx)^3\,dx}{b^4} + \frac{(6a^2)\int f^{\frac{c}{a+bx}}(a+bx)^2\,dx}{b^4} - \frac{(4a^3)\int f^{\frac{}{a+}}}{}$$

$$= \frac{a^4 f^{\frac{c}{a+bx}}(a+bx)}{b^5} - \frac{2a^3 f^{\frac{c}{a+bx}}(a+bx)^2}{b^5} + \frac{2a^2 f^{\frac{c}{a+bx}}(a+bx)^3}{b^5} - \frac{4ac^4\Gamma\left(-4,-\frac{c\log(f)}{a+bx}\right)\log^4(f)}{b^5}$$

$$= \frac{a^4 f^{\frac{c}{a+bx}}(a+bx)}{b^5} - \frac{2a^3 f^{\frac{c}{a+bx}}(a+bx)^2}{b^5} + \frac{2a^2 f^{\frac{c}{a+bx}}(a+bx)^3}{b^5} - \frac{2a^3 c f^{\frac{c}{a+bx}}(a+bx)\log(f)}{b^5} +$$

$$= \frac{a^4 f^{\frac{c}{a+bx}}(a+bx)}{b^5} - \frac{2a^3 f^{\frac{c}{a+bx}}(a+bx)^2}{b^5} + \frac{2a^2 f^{\frac{c}{a+bx}}(a+bx)^3}{b^5} - \frac{2a^3 c f^{\frac{c}{a+bx}}(a+bx)\log(f)}{b^5} +$$

$$= \frac{a^4 f^{\frac{c}{a+bx}}(a+bx)}{b^5} - \frac{2a^3 f^{\frac{c}{a+bx}}(a+bx)^2}{b^5} + \frac{2a^2 f^{\frac{c}{a+bx}}(a+bx)^3}{b^5} - \frac{2a^3 c f^{\frac{c}{a+bx}}(a+bx)\log(f)}{b^5} +$$

Mathematica [A]
time = 0.15, size = 241, normalized size = 0.83

$$\frac{a f^{\frac{c}{a+bx}}\left(24a^4-154a^3c\log(f)+102a^2c^2\log^2(f)-19ac^3\log^3(f)+c^4\log^4(f)\right)}{120b^5}+\frac{-c\,\mathrm{Ei}\left(\frac{c\log(f)}{a+bx}\right)\log(f)\left(120a^4-240a^3c\log(f)+120a^2c^2\log^2(f)-20ac^3\log^3(f)+c^4\log^4(f)\right)+bf^{\frac{c}{a+bx}}x\left(24b^4x^4+2c(-48a^3+18a^2bx-8ab^2x^2+3b^3x^3)\log(f)+2c^2(43a^2-7abx+b^2x^2)\log^2(f)+c^3(-18a+bx)\log^3(f)+c^4\log^4(f)\right)}{120b^5}$$

Antiderivative was successfully verified.

[In] Integrate[f^(c/(a + b*x))*x^4,x]

[Out] (a*f^(c/(a + b*x))*(24*a^4 - 154*a^3*c*Log[f] + 102*a^2*c^2*Log[f]^2 - 19*a*c^3*Log[f]^3 + c^4*Log[f]^4))/(120*b^5) + (-(c*ExpIntegralEi[(c*Log[f])/(a + b*x)]*Log[f]*(120*a^4 - 240*a^3*c*Log[f] + 120*a^2*c^2*Log[f]^2 - 20*a*c^3*Log[f]^3 + c^4*Log[f]^4)) + b*f^(c/(a + b*x))*x*(24*b^4*x^4 + 2*c*(-48*a^3 + 18*a^2*b*x - 8*a*b^2*x^2 + 3*b^3*x^3)*Log[f] + 2*c^2*(43*a^2 - 7*a*b*x + b^2*x^2)*Log[f]^2 + c^3*(-18*a + b*x)*Log[f]^3 + c^4*Log[f]^4))/(120*b^5)

Maple [A]
time = 0.10, size = 517, normalized size = 1.78

method	result
risch	$-\frac{7c^2\ln(f)^2 f^{\frac{c}{bx+a}} a\, x^2}{60b^3}+\frac{43c^2\ln(f)^2 f^{\frac{c}{bx+a}} a^2 x}{60b^4}-\frac{3c^3\ln(f)^3 f^{\frac{c}{bx+a}} a x}{20b^4}+\frac{c\ln(f) a^4\,\text{expIntegral}\left(1,-\frac{c\ln(f)}{bx+a}\right)}{b^5}-\frac{77c\ln(f) f^{\frac{c}{bx+a}}}{60b^5}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(f^(c/(b*x+a))*x^4,x,method=_RETURNVERBOSE)

[Out] -7/60*c^2*ln(f)^2/b^3*f^(c/(b*x+a))*a*x^2+43/60*c^2*ln(f)^2/b^4*f^(c/(b*x+a))*a^2*x-3/20*c^3*ln(f)^3/b^4*f^(c/(b*x+a))*a*x+c*ln(f)/b^5*a^4*Ei(1,-c*ln(f)/(b*x+a))-77/60*c*ln(f)/b^5*f^(c/(b*x+a))*a^4-2/15*c*ln(f)/b^2*f^(c/(b*x+a))*a*x^3+3/10*c*ln(f)/b^3*f^(c/(b*x+a))*a^2*x^2-4/5*c*ln(f)/b^4*f^(c/(b*x+a))*a^3*x+17/20*c^2*ln(f)^2/b^5*f^(c/(b*x+a))*a^3-19/120*c^3*ln(f)^3/b^5*f^(c/(b*x+a))*a^2+1/120*c^4*ln(f)^4/b^5*f^(c/(b*x+a))*a+1/5*f^(c/(b*x+a))*x^5+1/60*c^2*ln(f)^2/b^2*f^(c/(b*x+a))*x^3+1/120*c^3*ln(f)^3/b^3*f^(c/(b*x+a))*x^2+1/120*c^4*ln(f)^4/b^4*f^(c/(b*x+a))*x+c^3*ln(f)^3/b^5*a^2*Ei(1,-c*ln(f)/(b*x+a))+1/5/b^5*a^5*f^(c/(b*x+a))-2*c^2*ln(f)^2/b^5*a^3*Ei(1,-c*ln(f)/(b*x+a))-1/6*c^4*ln(f)^4/b^5*a*Ei(1,-c*ln(f)/(b*x+a))+1/20*c*ln(f)/b*f^(c/(b*x+a))*x^4+1/120*c^5*ln(f)^5/b^5*Ei(1,-c*ln(f)/(b*x+a))

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(c/(b*x+a))*x^4,x, algorithm="maxima")

[Out] 1/120*(24*b^4*x^5 + 6*b^3*c*x^4*log(f) + 2*(b^2*c^2*log(f)^2 - 8*a*b^2*c*log(f))*x^3 + (b*c^3*log(f)^3 - 14*a*b*c^2*log(f)^2 + 36*a^2*b*c*log(f))*x^2 + (c^4*log(f)^4 - 18*a*c^3*log(f)^3 + 86*a^2*c^2*log(f)^2 - 96*a^3*c*log(f))*x)*f^(c/(b*x + a))/b^4 + integrate(-1/120*(a^2*c^4*log(f)^4 - 18*a^3*c^3*

```
log(f)^3 + 86*a^4*c^2*log(f)^2 - 96*a^5*c*log(f) - (b*c^5*log(f)^5 - 20*a*b
*c^4*log(f)^4 + 120*a^2*b*c^3*log(f)^3 - 240*a^3*b*c^2*log(f)^2 + 120*a^4*b
*c*log(f))*x)*f^(c/(b*x + a))/(b^6*x^2 + 2*a*b^5*x + a^2*b^4), x)
```

Fricas [A]
time = 0.09, size = 243, normalized size = 0.84

$$\frac{\left(24\,b^{5}x^{5}+24\,a^{5}+\left(bc^{4}x+ac^{4}\right)\log\left(f\right)^{4}+\left(b^{2}c^{3}x^{2}-18\,abc^{3}x-19\,a^{2}c^{3}\right)\log\left(f\right)^{3}+2\left(b^{3}c^{2}x^{3}-7\,ab^{2}c^{2}x^{2}+43\,a^{2}bc^{2}x+51\,a^{3}c^{2}\right)\log\left(f\right)^{2}+2\left(3\,b^{4}cx^{4}-8\,ab^{3}cx^{3}+18\,a^{2}b^{2}cx^{2}-48\,a^{3}bcx-77\,a^{4}c\right)\log\left(f\right)\right)f^{\frac{c}{bx+a}}-\left(c^{5}\log\left(f\right)^{5}-20\,ac^{4}\log\left(f\right)^{4}+120\,a^{2}c^{3}\log\left(f\right)^{3}-240\,a^{3}c^{2}\log\left(f\right)^{2}+120\,a^{4}c\log\left(f\right)\right){\rm Ei}\left(\frac{c\log(f)}{bx+a}\right)}{120\,b^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x^4,x, algorithm="fricas")
```

```
[Out] 1/120*((24*b^5*x^5 + 24*a^5 + (b*c^4*x + a*c^4)*log(f)^4 + (b^2*c^3*x^2 - 1
8*a*b*c^3*x - 19*a^2*c^3)*log(f)^3 + 2*(b^3*c^2*x^3 - 7*a*b^2*c^2*x^2 + 43*
a^2*b*c^2*x + 51*a^3*c^2)*log(f)^2 + 2*(3*b^4*c*x^4 - 8*a*b^3*c*x^3 + 18*a^
2*b^2*c*x^2 - 48*a^3*b*c*x - 77*a^4*c)*log(f))*f^(c/(b*x + a)) - (c^5*log(f
)^5 - 20*a*c^4*log(f)^4 + 120*a^2*c^3*log(f)^3 - 240*a^3*c^2*log(f)^2 + 120
*a^4*c*log(f))*Ei(c*log(f)/(b*x + a)))/b^5
```

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

$$\int f^{\frac{c}{a+bx}}x^{4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a))*x**4,x)
```

```
[Out] Integral(f**(c/(a + b*x))*x**4, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x^4,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a))*x^4, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int f^{\frac{c}{a+b\,x}}\,x^4 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x))*x^4,x)
```

```
[Out] int(f^(c/(a + b*x))*x^4, x)
```

3.217 $\int f^{\frac{c}{a+bx}} x^3 \, dx$

Optimal. Leaf size=269

$$-\frac{a^3 f^{\frac{c}{a+bx}}(a+bx)}{b^4}+\frac{3a^2 f^{\frac{c}{a+bx}}(a+bx)^2}{2b^4}-\frac{af^{\frac{c}{a+bx}}(a+bx)^3}{b^4}+\frac{3a^2 cf^{\frac{c}{a+bx}}(a+bx)\log(f)}{2b^4}-\frac{acf^{\frac{c}{a+bx}}(a+bx)^2\log(f}{2b^4}$$

```
[Out] -a^3*f^(c/(b*x+a))*(b*x+a)/b^4+3/2*a^2*f^(c/(b*x+a))*(b*x+a)^2/b^4-a*f^(c/(
b*x+a))*(b*x+a)^3/b^4+3/2*a^2*c*f^(c/(b*x+a))*(b*x+a)*ln(f)/b^4-1/2*a*c*f^(
c/(b*x+a))*(b*x+a)^2*ln(f)/b^4+a^3*c*Ei(c*ln(f)/(b*x+a))*ln(f)/b^4-1/2*a*c^
2*f^(c/(b*x+a))*(b*x+a)*ln(f)^2/b^4-3/2*a^2*c^2*Ei(c*ln(f)/(b*x+a))*ln(f)^2
/b^4+1/2*a*c^3*Ei(c*ln(f)/(b*x+a))*ln(f)^3/b^4+(b*x+a)^4*Ei(5,-c*ln(f)/(b*x
+a))/b^4
```

Rubi [A]
time = 0.19, antiderivative size = 269, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {2258, 2237, 2241, 2245, 2250}

$$\frac{c^4\log^4(f)\text{Gamma}\left(-4,-\frac{c\log(f)}{a+bx}\right)}{b^4}+\frac{a^3c\log(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{b^4}-\frac{a^3(a+bx)f^{\frac{c}{a+bx}}}{b^4}-\frac{3a^2c^2\log^2(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{2b^4}+\frac{3a^2(a+bx)^2f^{\frac{c}{a+bx}}}{2b^4}+\frac{3a^2c\log(f)(a+bx)f^{\frac{c}{a+bx}}}{2b^4}+\frac{ac^3\log^3(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{2b^4}-\frac{ac^2\log^2(f)(a+bx)f^{\frac{c}{a+bx}}}{2b^4}-\frac{a(a+bx)^3f^{\frac{c}{a+bx}}}{b^4}-\frac{ac\log(f)(a+bx)^2f^{\frac{c}{a+bx}}}{2b^4}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x))*x^3,x]
```

```
[Out] -((a^3*f^(c/(a + b*x))*(a + b*x))/b^4) + (3*a^2*f^(c/(a + b*x))*(a + b*x)^2
)/(2*b^4) - (a*f^(c/(a + b*x))*(a + b*x)^3)/b^4 + (3*a^2*c*f^(c/(a + b*x))*
(a + b*x)*Log[f])/(2*b^4) - (a*c*f^(c/(a + b*x))*(a + b*x)^2*Log[f])/(2*b^4
) + (a^3*c*ExpIntegralEi[(c*Log[f])/(a + b*x)]*Log[f])/b^4 - (a*c^2*f^(c/(a
 + b*x))*(a + b*x)*Log[f]^2)/(2*b^4) - (3*a^2*c^2*ExpIntegralEi[(c*Log[f])/
(a + b*x)]*Log[f]^2)/(2*b^4) + (a*c^3*ExpIntegralEi[(c*Log[f])/(a + b*x)]*L
og[f]^3)/(2*b^4) + (c^4*Gamma[-4, -((c*Log[f])/(a + b*x))]*Log[f]^4)/b^4
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$
\begin{aligned}
\int f^{\frac{c}{a+bx}} x^3\,dx &= \int \left(-\frac{a^3 f^{\frac{c}{a+bx}}}{b^3}+\frac{3a^2 f^{\frac{c}{a+bx}}(a+bx)}{b^3}-\frac{3a f^{\frac{c}{a+bx}}(a+bx)^2}{b^3}+\frac{f^{\frac{c}{a+bx}}(a+bx)^3}{b^3}\right)dx\\
&= \frac{\int f^{\frac{c}{a+bx}}(a+bx)^3\,dx}{b^3}-\frac{(3a)\int f^{\frac{c}{a+bx}}(a+bx)^2\,dx}{b^3}+\frac{(3a^2)\int f^{\frac{c}{a+bx}}(a+bx)\,dx}{b^3}-\frac{a^3\int f^{\frac{c}{a+bx}}\,d}{b^3}\\
&= -\frac{a^3 f^{\frac{c}{a+bx}}(a+bx)}{b^4}+\frac{3a^2 f^{\frac{c}{a+bx}}(a+bx)^2}{2b^4}-\frac{a f^{\frac{c}{a+bx}}(a+bx)^3}{b^4}+\frac{c^4\Gamma\left(-4,-\frac{c\log(f)}{a+bx}\right)\log^4(f)}{b^4}-\\
&= -\frac{a^3 f^{\frac{c}{a+bx}}(a+bx)}{b^4}+\frac{3a^2 f^{\frac{c}{a+bx}}(a+bx)^2}{2b^4}-\frac{a f^{\frac{c}{a+bx}}(a+bx)^3}{b^4}+\frac{3a^2 c f^{\frac{c}{a+bx}}(a+bx)\log(f)}{2b^4}-\\
&= -\frac{a^3 f^{\frac{c}{a+bx}}(a+bx)}{b^4}+\frac{3a^2 f^{\frac{c}{a+bx}}(a+bx)^2}{2b^4}-\frac{a f^{\frac{c}{a+bx}}(a+bx)^3}{b^4}+\frac{3a^2 c f^{\frac{c}{a+bx}}(a+bx)\log(f)}{2b^4}-\\
&= -\frac{a^3 f^{\frac{c}{a+bx}}(a+bx)}{b^4}+\frac{3a^2 f^{\frac{c}{a+bx}}(a+bx)^2}{2b^4}-\frac{a f^{\frac{c}{a+bx}}(a+bx)^3}{b^4}+\frac{3a^2 c f^{\frac{c}{a+bx}}(a+bx)\log(f)}{2b^4}-
\end{aligned}
$$

Mathematica [A]

time = 0.12, size = 179, normalized size = 0.67

$$
-\frac{af^{\frac{c}{a+bx}}\left(6a^3-26a^2c\log(f)+11ac^2\log^2(f)-c^3\log^3(f)\right)}{24b^4}+\frac{c\,\mathrm{Ei}\left(\frac{c\log(f)}{a+bx}\right)\log(f)\left(24a^3-36a^2c\log(f)+12ac^2\log^2(f)-c^3\log^3(f)\right)+bf^{\frac{c}{a+bx}}x\left(6b^3x^3+2c(9a^2-3abx+b^2x^2)\log(f)+c^2(-10a+bx)\log^2(f)+c^3\log^3(f)\right)}{24b^4}
$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x))*x^3,x]
```

```
[Out] -1/24*(a*f^(c/(a + b*x))*(6*a^3 - 26*a^2*c*Log[f] + 11*a*c^2*Log[f]^2 - c^3
*Log[f]^3))/b^4 + (c*ExpIntegralEi[(c*Log[f])/(a + b*x)]*Log[f]*(24*a^3 - 3
6*a^2*c*Log[f] + 12*a*c^2*Log[f]^2 - c^3*Log[f]^3) + b*f^(c/(a + b*x))*x*(6
*b^3*x^3 + 2*c*(9*a^2 - 3*a*b*x + b^2*x^2)*Log[f] + c^2*(-10*a + b*x)*Log[f
]^2 + c^3*Log[f]^3))/(24*b^4)
```

Maple [A]
time = 0.07, size = 359, normalized size = 1.33

method	result
risch	$-\frac{c^{3} \ln(f)^{3} a \,\mathrm{expIntegral}\left(1,-\frac{c\ln(f)}{bx+a}\right)}{2b^{4}}+\frac{f^{\frac{c}{bx+a}} x^{4}}{4}+\frac{c^{2}\ln(f)^{2} f^{\frac{c}{bx+a}} x^{2}}{24b^{2}}+\frac{c^{3}\ln(f)^{3} f^{\frac{c}{bx+a}} x}{24b^{3}}+\frac{3c^{2}\ln(f)^{2} a^{2}\,\mathrm{expIntegral}\left(1,-\frac{c\ln}{bx}\right.}{2b^{4}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a))*x^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*c^3*ln(f)^3/b^4*a*Ei(1,-c*ln(f)/(b*x+a))+1/4*f^(c/(b*x+a))*x^4+1/24*c^
2*ln(f)^2/b^2*f^(c/(b*x+a))*x^2+1/24*c^3*ln(f)^3/b^3*f^(c/(b*x+a))*x+3/2*c^
2*ln(f)^2/b^4*a^2*Ei(1,-c*ln(f)/(b*x+a))-1/4/b^4*f^(c/(b*x+a))*a^4-1/4*c*ln
(f)/b^2*f^(c/(b*x+a))*a*x^2+3/4*c*ln(f)/b^3*f^(c/(b*x+a))*a^2*x-11/24*c^2*l
n(f)^2/b^4*f^(c/(b*x+a))*a^2+1/24*c^3*ln(f)^3/b^4*f^(c/(b*x+a))*a+13/12*c*l
n(f)/b^4*f^(c/(b*x+a))*a^3-c*ln(f)/b^4*a^3*Ei(1,-c*ln(f)/(b*x+a))-5/12*c^2*
ln(f)^2/b^3*f^(c/(b*x+a))*a*x+1/12*c*ln(f)/b*f^(c/(b*x+a))*x^3+1/24*c^4*ln(
f)^4/b^4*Ei(1,-c*ln(f)/(b*x+a))
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x^3,x, algorithm="maxima")
```

```
[Out] 1/24*(6*b^3*x^4 + 2*b^2*c*x^3*log(f) + (b*c^2*log(f)^2 - 6*a*b*c*log(f))*x^
2 + (c^3*log(f)^3 - 10*a*c^2*log(f)^2 + 18*a^2*c*log(f))*x)*f^(c/(b*x + a))
/b^3 - integrate(1/24*(a^2*c^3*log(f)^3 - 10*a^3*c^2*log(f)^2 + 18*a^4*c*lo
g(f) - (b*c^4*log(f)^4 - 12*a*b*c^3*log(f)^3 + 36*a^2*b*c^2*log(f)^2 - 24*a
^3*b*c*log(f))*x)*f^(c/(b*x + a))/(b^5*x^2 + 2*a*b^4*x + a^2*b^3), x)
```

Fricas [A]
time = 0.09, size = 171, normalized size = 0.64

$$\frac{\left(6\,b^{4}x^{4}-6\,a^{4}+\left(bc^{3}x+ac^{3}\right)\log\left(f\right)^{3}+\left(b^{2}c^{2}x^{2}-10\,abc^{2}x-11\,a^{2}c^{2}\right)\log\left(f\right)^{2}+2\left(b^{3}cx^{3}-3\,ab^{2}cx^{2}+9\,a^{2}bcx+13\,a^{3}c\right)\log\left(f\right)\right)f^{\frac{c}{bx+a}}-\left(c^{4}\log\left(f\right)^{4}-12\,ac^{3}\log\left(f\right)^{3}+36\,a^{2}c^{2}\log\left(f\right)^{2}-24\,a^{3}c\log\left(f\right)\right)\mathrm{Ei}\left(\frac{c\log(f)}{bx+a}\right)}{24\,b^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x^3,x, algorithm="fricas")
```

```
[Out] 1/24*((6*b^4*x^4 - 6*a^4 + (b*c^3*x + a*c^3)*log(f)^3 + (b^2*c^2*x^2 - 10*a
*b*c^2*x - 11*a^2*c^2)*log(f)^2 + 2*(b^3*c*x^3 - 3*a*b^2*c*x^2 + 9*a^2*b*c*
x + 13*a^3*c)*log(f))*f^(c/(b*x + a)) - (c^4*log(f)^4 - 12*a*c^3*log(f)^3 +
 36*a^2*c^2*log(f)^2 - 24*a^3*c*log(f))*Ei(c*log(f)/(b*x + a)))/b^4
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{a+bx}}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a))*x**3,x)
```

```
[Out] Integral(f**(c/(a + b*x))*x**3, x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x^3,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a))*x^3, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int f^{\frac{c}{a+b\,x}}\,x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x))*x^3,x)
```

```
[Out] int(f^(c/(a + b*x))*x^3, x)
```

3.218 $\int f^{\frac{c}{a+bx}} x^2 \, dx$

Optimal. Leaf size=229

$$\frac{a^2 f^{\frac{c}{a+bx}}(a+bx)}{b^3}-\frac{a f^{\frac{c}{a+bx}}(a+bx)^2}{b^3}+\frac{f^{\frac{c}{a+bx}}(a+bx)^3}{3b^3}-\frac{acf^{\frac{c}{a+bx}}(a+bx)\log(f)}{b^3}+\frac{cf^{\frac{c}{a+bx}}(a+bx)^2\log(f)}{6b^3}-\frac{a^2c\text{Ei}}{}$$

```
[Out] a^2*f^(c/(b*x+a))*(b*x+a)/b^3-a*f^(c/(b*x+a))*(b*x+a)^2/b^3+1/3*f^(c/(b*x+a
))*(b*x+a)^3/b^3-a*c*f^(c/(b*x+a))*(b*x+a)*ln(f)/b^3+1/6*c*f^(c/(b*x+a))*(b
*x+a)^2*ln(f)/b^3-a^2*c*Ei(c*ln(f)/(b*x+a))*ln(f)/b^3+1/6*c^2*f^(c/(b*x+a))
*(b*x+a)*ln(f)^2/b^3+a*c^2*Ei(c*ln(f)/(b*x+a))*ln(f)^2/b^3-1/6*c^3*Ei(c*ln(
f)/(b*x+a))*ln(f)^3/b^3
```

Rubi [A]
time = 0.16, antiderivative size = 229, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$, Rules used = {2258, 2237, 2241, 2245}

$$-\frac{a^2c\log(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{b^3}+\frac{a^2(a+bx)f^{\frac{c}{a+bx}}}{b^3}-\frac{c^3\log^3(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{6b^3}+\frac{ac^2\log^2(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{b^3}+\frac{c^2\log^2(f)(a+bx)f^{\frac{c}{a+bx}}}{6b^3}+\frac{(a+bx)^3f^{\frac{c}{a+bx}}}{3b^3}-\frac{a(a+bx)^2f^{\frac{c}{a+bx}}}{b^3}+\frac{c\log(f)(a+bx)^2f^{\frac{c}{a+bx}}}{6b^3}-\frac{ac\log(f)(a+bx)f^{\frac{c}{a+bx}}}{b^3}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x))*x^2,x]
```

```
[Out] (a^2*f^(c/(a + b*x))*(a + b*x))/b^3 - (a*f^(c/(a + b*x))*(a + b*x)^2)/b^3 +
 (f^(c/(a + b*x))*(a + b*x)^3)/(3*b^3) - (a*c*f^(c/(a + b*x))*(a + b*x)*Log
[f])/b^3 + (c*f^(c/(a + b*x))*(a + b*x)^2*Log[f])/(6*b^3) - (a^2*c*ExpInteg
ralEi[(c*Log[f])/(a + b*x)]*Log[f])/b^3 + (c^2*f^(c/(a + b*x))*(a + b*x)*Lo
g[f]^2)/(6*b^3) + (a*c^2*ExpIntegralEi[(c*Log[f])/(a + b*x)]*Log[f]^2)/b^3
- (c^3*ExpIntegralEi[(c*Log[f])/(a + b*x)]*Log[f]^3)/(6*b^3)
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
```

```
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\begin{aligned}
\int f^{\frac{c}{a+bx}}x^2\,dx &= \int\left(\frac{a^2f^{\frac{c}{a+bx}}}{b^2}-\frac{2af^{\frac{c}{a+bx}}(a+bx)}{b^2}+\frac{f^{\frac{c}{a+bx}}(a+bx)^2}{b^2}\right)dx\\
&= \frac{\int f^{\frac{c}{a+bx}}(a+bx)^2\,dx}{b^2}-\frac{(2a)\int f^{\frac{c}{a+bx}}(a+bx)\,dx}{b^2}+\frac{a^2\int f^{\frac{c}{a+bx}}\,dx}{b^2}\\
&= \frac{a^2f^{\frac{c}{a+bx}}(a+bx)}{b^3}-\frac{af^{\frac{c}{a+bx}}(a+bx)^2}{b^3}+\frac{f^{\frac{c}{a+bx}}(a+bx)^3}{3b^3}+\frac{(c\log(f))\int f^{\frac{c}{a+bx}}(a+bx)\,dx}{3b^2}-(a\\
&= \frac{a^2f^{\frac{c}{a+bx}}(a+bx)}{b^3}-\frac{af^{\frac{c}{a+bx}}(a+bx)^2}{b^3}+\frac{f^{\frac{c}{a+bx}}(a+bx)^3}{3b^3}-\frac{acf^{\frac{c}{a+bx}}(a+bx)\log(f)}{b^3}+\frac{cf^{\frac{c}{a+bx}}(\\
&= \frac{a^2f^{\frac{c}{a+bx}}(a+bx)}{b^3}-\frac{af^{\frac{c}{a+bx}}(a+bx)^2}{b^3}+\frac{f^{\frac{c}{a+bx}}(a+bx)^3}{3b^3}-\frac{acf^{\frac{c}{a+bx}}(a+bx)\log(f)}{b^3}+\frac{cf^{\frac{c}{a+bx}}(\\
&= \frac{a^2f^{\frac{c}{a+bx}}(a+bx)}{b^3}-\frac{af^{\frac{c}{a+bx}}(a+bx)^2}{b^3}+\frac{f^{\frac{c}{a+bx}}(a+bx)^3}{3b^3}-\frac{acf^{\frac{c}{a+bx}}(a+bx)\log(f)}{b^3}+\frac{cf^{\frac{c}{a+bx}}(
\end{aligned}$$

Mathematica [A]
time = 0.08, size = 128, normalized size = 0.56

$$\frac{af^{\frac{c}{a+bx}}(2a^2-5ac\log(f)+c^2\log^2(f))}{6b^3}+\frac{-c\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)\log(f)\left(6a^2-6ac\log(f)+c^2\log^2(f)\right)+bf^{\frac{c}{a+bx}}x\left(2b^2x^2+(-4ac+bcx)\log(f)+c^2\log^2(f)\right)}{6b^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x))*x^2,x]
```

```
[Out] (a*f^(c/(a + b*x))*(2*a^2 - 5*a*c*Log[f] + c^2*Log[f]^2))/(6*b^3) + (-(c*Ex
pIntegralEi[(c*Log[f])/(a + b*x)]*Log[f]*(6*a^2 - 6*a*c*Log[f] + c^2*Log[f]
^2)) + b*f^(c/(a + b*x))*x*(2*b^2*x^2 + (-4*a*c + b*c*x)*Log[f] + c^2*Log[f
]^2))/(6*b^3)
```

Maple [A]
time = 0.08, size = 227, normalized size = 0.99

method	result
risch	$\frac{a^3 f^{\frac{c}{bx+a}}}{3b^3}+\frac{c\ln(f)a^2\,\mathrm{expIntegral}\left(1,-\frac{c\ln(f)}{bx+a}\right)}{b^3}+\frac{f^{\frac{c}{bx+a}}x^3}{3}+\frac{c\ln(f)f^{\frac{c}{bx+a}}x^2}{6b}-\frac{2c\ln(f)f^{\frac{c}{bx+a}}ax}{3b^2}-\frac{5c\ln(f)f^{\frac{c}{bx+a}}a^2}{6b^3}+\frac{c^2}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a))*x^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3/b^3*a^3*f^(c/(b*x+a))+c*ln(f)/b^3*a^2*Ei(1,-c*ln(f)/(b*x+a))+1/3*f^(c/(
b*x+a))*x^3+1/6*c*ln(f)/b*f^(c/(b*x+a))*x^2-2/3*c*ln(f)/b^2*f^(c/(b*x+a))*a
*x-5/6*c*ln(f)/b^3*f^(c/(b*x+a))*a^2+1/6*c^2*ln(f)^2/b^2*f^(c/(b*x+a))*x+1/
6*c^2*ln(f)^2/b^3*f^(c/(b*x+a))*a+1/6*c^3*ln(f)^3/b^3*Ei(1,-c*ln(f)/(b*x+a)
)-c^2*ln(f)^2/b^3*a*Ei(1,-c*ln(f)/(b*x+a))
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x^2,x, algorithm="maxima")
```

```
[Out] 1/6*(2*b^2*x^3 + b*c*x^2*log(f) + (c^2*log(f)^2 - 4*a*c*log(f))*x)*f^(c/(b*
x + a))/b^2 + integrate(-1/6*(a^2*c^2*log(f)^2 - 4*a^3*c*log(f) - (b*c^3*lo
g(f)^3 - 6*a*b*c^2*log(f)^2 + 6*a^2*b*c*log(f))*x)*f^(c/(b*x + a))/(b^4*x^2
 + 2*a*b^3*x + a^2*b^2), x)
```

Fricas [A]
time = 0.38, size = 114, normalized size = 0.50

$$\frac{\left(2\,b^3x^3+2\,a^3+\left(bc^2x+ac^2\right)\log\left(f\right)^2+\left(b^2cx^2-4\,abcx-5\,a^2c\right)\log\left(f\right)\right)f^{\frac{c}{bx+a}}-\left(c^3\log\left(f\right)^3-6\,ac^2\log\left(f\right)^2+6\,a^2c\log\left(f\right)\right)\mathrm{Ei}\left(\frac{c\log(f)}{bx+a}\right)}{6\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x^2,x, algorithm="fricas")
```

```
[Out] 1/6*((2*b^3*x^3 + 2*a^3 + (b*c^2*x + a*c^2)*log(f)^2 + (b^2*c*x^2 - 4*a*b*c
*x - 5*a^2*c)*log(f))*f^(c/(b*x + a)) - (c^3*log(f)^3 - 6*a*c^2*log(f)^2 +
6*a^2*c*log(f))*Ei(c*log(f)/(b*x + a)))/b^3
```

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

$$\int f^{\frac{c}{a+bx}}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a))*x**2,x)
```

```
[Out] Integral(f**(c/(a + b*x))*x**2, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x^2,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a))*x^2, x)
```

Mupad [B]
time = 3.93, size = 209, normalized size = 0.91

$$\frac{\frac{b\,f^{\frac{c}{a+b\,x}}\,x^4}{3}+f^{\frac{c}{a+b\,x}}\,x^3\,\left(\frac{a}{3}+\frac{c\,\ln(f)}{6}\right)+\frac{f^{\frac{c}{a+b\,x}}\,x\,\left(2\,a^3-9\,a^2\,c\,\ln(f)+2\,a\,c^2\,\ln(f)^2\right)}{6\,b^2}+\frac{f^{\frac{c}{a+b\,x}}\,x^2\,\left(c^2\,\ln(f)^2-3\,a\,c\,\ln(f)\right)}{6\,b}+\frac{a^2\,f^{\frac{c}{a+b\,x}}\,\left(2\,a^2-5\,a\,c\,\ln(f)+c^2\,\ln(f)^2\right)}{6\,b^3}}{a+b\,x}-\frac{\mathrm{ei}\left(\frac{c\,\ln(f)}{a+b\,x}\right)\,\left(6\,a^2\,c\,\ln\left(f\right)-6\,a\,c^2\,\ln\left(f\right)^2+c^3\,\ln\left(f\right)^3\right)}{6\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x))*x^2,x)
```

```
[Out] ((b*f^(c/(a + b*x))*x^4)/3 + f^(c/(a + b*x))*x^3*(a/3 + (c*log(f))/6) + (f^
(c/(a + b*x))*x*(2*a^3 - 9*a^2*c*log(f) + 2*a*c^2*log(f)^2))/(6*b^2) + (f^(
c/(a + b*x))*x^2*(c^2*log(f)^2 - 3*a*c*log(f)))/(6*b) + (a^2*f^(c/(a + b*x)
)*(c^2*log(f)^2 + 2*a^2 - 5*a*c*log(f)))/(6*b^3))/(a + b*x) - (ei((c*log(f)
)/(a + b*x))*(c^3*log(f)^3 + 6*a^2*c*log(f) - 6*a*c^2*log(f)^2))/(6*b^3)
```

3.219 $\int f^{\frac{c}{a+bx}} x \, dx$

Optimal. Leaf size=120

$$-\frac{af^{\frac{c}{a+bx}}(a+bx)}{b^2}+\frac{f^{\frac{c}{a+bx}}(a+bx)^2}{2b^2}+\frac{cf^{\frac{c}{a+bx}}(a+bx)\log(f)}{2b^2}+\frac{ac\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)\log(f)}{b^2}-\frac{c^2\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)\log^2(f)}{2b^2}$$

```
[Out] -a*f^(c/(b*x+a))*(b*x+a)/b^2+1/2*f^(c/(b*x+a))*(b*x+a)^2/b^2+1/2*c*f^(c/(b*
x+a))*(b*x+a)*ln(f)/b^2+a*c*Ei(c*ln(f)/(b*x+a))*ln(f)/b^2-1/2*c^2*Ei(c*ln(f
)/(b*x+a))*ln(f)^2/b^2
```

Rubi [A]
time = 0.08, antiderivative size = 120, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {2258, 2237, 2241, 2245}

$$-\frac{c^2\log^2(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{2b^2}+\frac{ac\log(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{b^2}+\frac{(a+bx)^2f^{\frac{c}{a+bx}}}{2b^2}-\frac{a(a+bx)f^{\frac{c}{a+bx}}}{b^2}+\frac{c\log(f)(a+bx)f^{\frac{c}{a+bx}}}{2b^2}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x))*x,x]
```

```
[Out] -((a*f^(c/(a + b*x))*(a + b*x))/b^2) + (f^(c/(a + b*x))*(a + b*x)^2)/(2*b^2
) + (c*f^(c/(a + b*x))*(a + b*x)*Log[f])/(2*b^2) + (a*c*ExpIntegralEi[(c*Lo
g[f])/(a + b*x)]*Log[f])/b^2 - (c^2*ExpIntegralEi[(c*Log[f])/(a + b*x)]*Log
[f]^2)/(2*b^2)
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
```

```
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{\frac{c}{a+bx}} x\,dx = \int \left(-\frac{af^{\frac{c}{a+bx}}}{b} + \frac{f^{\frac{c}{a+bx}}(a+bx)}{b}\right) dx$$

$$= \frac{\int f^{\frac{c}{a+bx}}(a+bx)\,dx}{b} - \frac{a\int f^{\frac{c}{a+bx}}\,dx}{b}$$

$$= -\frac{af^{\frac{c}{a+bx}}(a+bx)}{b^2} + \frac{f^{\frac{c}{a+bx}}(a+bx)^2}{2b^2} + \frac{(c\log(f))\int f^{\frac{c}{a+bx}}\,dx}{2b} - \frac{(ac\log(f))\int \frac{f^{\frac{c}{a+bx}}}{a+bx}\,dx}{b}$$

$$= -\frac{af^{\frac{c}{a+bx}}(a+bx)}{b^2} + \frac{f^{\frac{c}{a+bx}}(a+bx)^2}{2b^2} + \frac{cf^{\frac{c}{a+bx}}(a+bx)\log(f)}{2b^2} + \frac{ac\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)\log(f)}{b^2} + \frac{(c^2 \text{lo}}{}$$

$$= -\frac{af^{\frac{c}{a+bx}}(a+bx)}{b^2} + \frac{f^{\frac{c}{a+bx}}(a+bx)^2}{2b^2} + \frac{cf^{\frac{c}{a+bx}}(a+bx)\log(f)}{2b^2} + \frac{ac\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)\log(f)}{b^2} - \frac{c^2\text{Ei}}{}$$

Mathematica [A]
time = 0.05, size = 82, normalized size = 0.68

$$-\frac{af^{\frac{c}{a+bx}}(a-c\log(f))}{2b^2} + \frac{c\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)\log(f)(2a-c\log(f)) + bf^{\frac{c}{a+bx}}x(bx+c\log(f))}{2b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x))*x,x]
```

```
[Out] -1/2*(a*f^(c/(a + b*x))*(a - c*Log[f]))/b^2 + (c*ExpIntegralEi[(c*Log[f])/(
a + b*x)]*Log[f]*(2*a - c*Log[f]) + b*f^(c/(a + b*x))*x*(b*x + c*Log[f]))/(
2*b^2)
```

Maple [A]
time = 0.08, size = 126, normalized size = 1.05

method	result

risch	$\frac{f^{\frac{c}{bx+a}}x^2}{2}-\frac{f^{\frac{c}{bx+a}}a^2}{2b^2}+\frac{c\ln(f)f^{\frac{c}{bx+a}}x}{2b}+\frac{c\ln(f)f^{\frac{c}{bx+a}}a}{2b^2}+\frac{c^2\ln(f)^2\,\mathrm{expIntegral}\left(1,-\frac{c\ln(f)}{bx+a}\right)}{2b^2}-\frac{c\ln(f)a\,\mathrm{expIntegral}\left(1,-\frac{c\ln}{bx}\right.}{b^2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a))*x,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*f^(c/(b*x+a))*x^2-1/2/b^2*f^(c/(b*x+a))*a^2+1/2*c*ln(f)/b*f^(c/(b*x+a))
*x+1/2*c*ln(f)/b^2*f^(c/(b*x+a))*a+1/2*c^2*ln(f)^2/b^2*Ei(1,-c*ln(f)/(b*x+a
))-c*ln(f)/b^2*a*Ei(1,-c*ln(f)/(b*x+a))
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x,x, algorithm="maxima")
```

```
[Out] 1/2*(b*x^2 + c*x*log(f))*f^(c/(b*x + a))/b - integrate(1/2*(a^2*c*log(f) -
(b*c^2*log(f)^2 - 2*a*b*c*log(f))*x)*f^(c/(b*x + a))/(b^3*x^2 + 2*a*b^2*x +
 a^2*b), x)
```

Fricas [A]
time = 0.40, size = 71, normalized size = 0.59

$$\frac{\left(b^2x^2-a^2+(bcx+ac)\log\left(f\right)\right)f^{\frac{c}{bx+a}}-\left(c^2\log\left(f\right)^2-2\,ac\log\left(f\right)\right)\mathrm{Ei}\left(\frac{c\log(f)}{bx+a}\right)}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x,x, algorithm="fricas")
```

```
[Out] 1/2*((b^2*x^2 - a^2 + (b*c*x + a*c)*log(f))*f^(c/(b*x + a)) - (c^2*log(f)^2
 - 2*a*c*log(f))*Ei(c*log(f)/(b*x + a)))/b^2
```

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

$$\int f^{\frac{c}{a+bx}}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a))*x,x)
```

```
[Out] Integral(f**(c/(a + b*x))*x, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a))*x, x)
```

Mupad [B]
time = 3.65, size = 136, normalized size = 1.13

$$\frac{\frac{b\,f^{\frac{c}{a+b\,x}}\,x^3}{2}+f^{\frac{c}{a+b\,x}}\,x^2\,\left(\frac{a}{2}+\frac{c\,\ln(f)}{2}\right)-\frac{a^2\,f^{\frac{c}{a+b\,x}}\,(a-c\,\ln(f))}{2\,b^2}-\frac{f^{\frac{c}{a+b\,x}}\,x\,(a^2-2\,a\,c\,\ln(f))}{2\,b}}{a+b\,x}-\frac{\mathrm{ei}\left(\frac{c\,\ln(f)}{a+b\,x}\right)\,\left(c^2\ln\left(f\right)^2-2\,a\,c\,\ln\left(f\right)\right)}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x))*x,x)
```

```
[Out] ((b*f^(c/(a + b*x))*x^3)/2 + f^(c/(a + b*x))*x^2*(a/2 + (c*log(f))/2) - (a^
2*f^(c/(a + b*x))*(a - c*log(f)))/(2*b^2) - (f^(c/(a + b*x))*x*(a^2 - 2*a*c
*log(f)))/(2*b))/(a + b*x) - (ei((c*log(f))/(a + b*x))*(c^2*log(f)^2 - 2*a*
c*log(f)))/(2*b^2)
```

3.220 $\int f^{\frac{c}{a+bx}}\,dx$

Optimal. Leaf size=41

$$\frac{f^{\frac{c}{a+bx}}(a+bx)}{b}-\frac{c\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)\log(f)}{b}$$

```
[Out] f^(c/(b*x+a))*(b*x+a)/b-c*Ei(c*ln(f)/(b*x+a))*ln(f)/b
```

Rubi [A]
time = 0.02, antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = {2237, 2241}

$$\frac{(a+bx)f^{\frac{c}{a+bx}}}{b}-\frac{c\log(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{b}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x)),x]
```

```
[Out] (f^(c/(a + b*x))*(a + b*x))/b - (c*ExpIntegralEi[(c*Log[f])/(a + b*x)]*Log[
f])/b
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\begin{aligned}\int f^{\frac{c}{a+bx}}\,dx &= \frac{f^{\frac{c}{a+bx}}(a+bx)}{b}+(c\log(f))\int\frac{f^{\frac{c}{a+bx}}}{a+bx}\,dx\\ &= \frac{f^{\frac{c}{a+bx}}(a+bx)}{b}-\frac{c\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)\log(f)}{b}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 41, normalized size = 1.00

$$\frac{f^{\frac{c}{a+bx}}(a+bx)}{b}-\frac{c\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)\log(f)}{b}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x)),x]
```

```
[Out] (f^(c/(a + b*x))*(a + b*x))/b - (c*ExpIntegralEi[(c*Log[f])/(a + b*x)]*Log[
f])/b
```

Maple [A]
time = 0.07, size = 52, normalized size = 1.27

method	result	size
risch	$f^{\frac{c}{bx+a}}x+\frac{f^{\frac{c}{bx+a}}a}{b}+\frac{c\ln(f)\,\text{expIntegral}\left(1,-\frac{c\ln(f)}{bx+a}\right)}{b}$	52

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a)),x,method=_RETURNVERBOSE)
```

```
[Out] f^(c/(b*x+a))*x+1/b*f^(c/(b*x+a))*a+c/b*ln(f)*Ei(1,-c*ln(f)/(b*x+a))
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)),x, algorithm="maxima")
```

```
[Out] b*c*integrate(f^(c/(b*x + a))*x/(b^2*x^2 + 2*a*b*x + a^2), x)*log(f) + f^(c
/(b*x + a))*x
```

Fricas [A]
time = 0.36, size = 40, normalized size = 0.98

$$-\frac{c\text{Ei}\left(\frac{c\log(f)}{bx+a}\right)\log\left(f\right)-(bx+a)f^{\frac{c}{bx+a}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)),x, algorithm="fricas")
```

```
[Out] -(c*Ei(c*log(f)/(b*x + a))*log(f) - (b*x + a)*f^(c/(b*x + a)))/b
```

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

$$\int f^{\frac{c}{a+bx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)),x)
```

```
[Out] Integral(f**(c/(a + b*x)), x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a)), x)
```

Mupad [B]
time = 3.55, size = 50, normalized size = 1.22

$$f^{\frac{c}{a+b\,x}}\,x+\frac{a\,f^{\frac{c}{a+b\,x}}}{b}-\frac{c\,\mathrm{ei}\left(\frac{c\,\ln(f)}{a+b\,x}\right)\,\ln\left(f\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)),x)
```

```
[Out] f^(c/(a + b*x))*x + (a*f^(c/(a + b*x)))/b - (c*ei((c*log(f))/(a + b*x))*log
(f))/b
```

3.221 $\int \frac{f^{\frac{c}{a+bx}}}{x}\,dx$

Optimal. Leaf size=41

$$-\mathrm{Ei}\left(\frac{c\log(f)}{a+bx}\right)+f^{\frac{c}{a}}\mathrm{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)$$

```
[Out] -Ei(c*ln(f)/(b*x+a))+f^(c/a)*Ei(-b*c*x*ln(f)/a/(b*x+a))
```

Rubi [A]
time = 0.10, antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$, Rules used = {2254, 2241, 2260, 2209}

$$f^{\frac{c}{a}}\mathrm{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)-\mathrm{Ei}\left(\frac{c\log(f)}{a+bx}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x))/x,x]
```

```
[Out] -ExpIntegralEi[(c*Log[f])/(a + b*x)] + f^(c/a)*ExpIntegralEi[-((b*c*x*Log[f
])/(a*(a + b*x)))]
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2254

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/((e_.) + (f_.)*(x_)), x_Symbo
l] :> Dist[d/f, Int[F^(a + b/(c + d*x))/(c + d*x), x], x] - Dist[(d*e - c*f
)/f, Int[F^(a + b/(c + d*x))/((c + d*x)*(e + f*x)), x], x] /; FreeQ[{F, a,
b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
```

Rule 2260

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/(((e_.) + (f_.)*(x_))*((g_.)
+ (h_.)*(x_))), x_Symbol] :> Dist[-d/(f*(d*g - c*h)), Subst[Int[F^(a - b*(h
```

```
/(d*g - c*h)) + d*b*(x/(d*g - c*h)))/x, x], x, (g + h*x)/(c + d*x)], x] /;
FreeQ[{F, a, b, c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{f^{\frac{c}{a+bx}}}{x}\,dx &= a\int \frac{f^{\frac{c}{a+bx}}}{x(a+bx)}\,dx + b\int \frac{f^{\frac{c}{a+bx}}}{a+bx}\,dx\\ &= -\mathrm{Ei}\left(\frac{c\log(f)}{a+bx}\right) + \mathrm{Subst}\left(\int \frac{f^{\frac{c}{a}-\frac{bcx}{a}}}{x}\,dx, x, \frac{x}{a+bx}\right)\\ &= -\mathrm{Ei}\left(\frac{c\log(f)}{a+bx}\right) + f^{\frac{c}{a}}\mathrm{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)\end{aligned}$$

Mathematica [A]
time = 0.02, size = 41, normalized size = 1.00

$$-\mathrm{Ei}\left(\frac{c\log(f)}{a+bx}\right) + f^{\frac{c}{a}}\mathrm{Ei}\left(-\frac{bcx\log(f)}{a^2+abx}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x))/x,x]
[Out] -ExpIntegralEi[(c*Log[f])/(a + b*x)] + f^(c/a)*ExpIntegralEi[-((b*c*x*Log[f
])/(a^2 + a*b*x))]
```

Maple [A]
time = 0.09, size = 47, normalized size = 1.15

method	result	size
risch	$-f^{\frac{c}{a}}\,\mathrm{expIntegral}\left(1, -\frac{c\ln(f)}{bx+a}+\frac{c\ln(f)}{a}\right)+\mathrm{expIntegral}\left(1, -\frac{c\ln(f)}{bx+a}\right)$	47

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a))/x,x,method=_RETURNVERBOSE)
[Out] -f^(c/a)*Ei(1,-c*ln(f)/(b*x+a)+c*ln(f)/a)+Ei(1,-c*ln(f)/(b*x+a))
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))/x,x, algorithm="maxima")
```

```
[Out] integrate(f^(c/(b*x + a))/x, x)
```

Fricas [A]
time = 0.35, size = 41, normalized size = 1.00

$$f^{\frac{c}{a}}\mathrm{Ei}\left(-\frac{bcx\log(f)}{abx+a^2}\right)-\mathrm{Ei}\left(\frac{c\log(f)}{bx+a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))/x,x, algorithm="fricas")
```

```
[Out] f^(c/a)*Ei(-b*c*x*log(f)/(a*b*x + a^2)) - Ei(c*log(f)/(b*x + a))
```

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

$$\int\frac{f^{\frac{c}{a+bx}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a))/x,x)
```

```
[Out] Integral(f**(c/(a + b*x))/x, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))/x,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a))/x, x)
```

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

$$\int\frac{f^{\frac{c}{a+b\,x}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x))/x,x)
```

```
[Out] int(f^(c/(a + b*x))/x, x)
```

3.222 $\int \frac{f^{\frac{c}{a+bx}}}{x^2}\,dx$

Optimal. Leaf size=68

$$-\frac{bf^{\frac{c}{a+bx}}}{a}-\frac{f^{\frac{c}{a+bx}}}{x}-\frac{bcf^{\frac{c}{a}}\operatorname{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)\log(f)}{a^2}$$

```
[Out] -b*f^(c/(b*x+a))/a-f^(c/(b*x+a))/x-b*c*f^(c/a)*Ei(-b*c*x*ln(f)/a/(b*x+a))*l
n(f)/a^2
```

Rubi [A]
time = 0.28, antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.467$, Rules used = {2255, 6874, 2254, 2241, 2260, 2209, 2240}

$$-\frac{bc\log(f)f^{\frac{c}{a}}\operatorname{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)}{a^2}-\frac{bf^{\frac{c}{a+bx}}}{a}-\frac{f^{\frac{c}{a+bx}}}{x}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x))/x^2,x]
```

```
[Out] -((b*f^(c/(a + b*x)))/a) - f^(c/(a + b*x))/x - (b*c*f^(c/a)*ExpIntegralEi[-
((b*c*x*Log[f])/(a*(a + b*x)))]*Log[f])/a^2
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2254

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/((e_.) + (f_.)*(x_)), x_Symbo
l] :> Dist[d/f, Int[F^(a + b/(c + d*x))/(c + d*x), x], x] - Dist[(d*e - c*f
)/f, Int[F^(a + b/(c + d*x))/((c + d*x)*(e + f*x)), x], x] /; FreeQ[{F, a,
b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
```

Rule 2255

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))*((e_.) + (f_.)*(x_))^(m_), x_
Symbol] :> Simp[(e + f*x)^(m + 1)*(F^(a + b/(c + d*x))/(f*(m + 1))), x] + D
ist[b*d*(Log[F]/(f*(m + 1))), Int[(e + f*x)^(m + 1)*(F^(a + b/(c + d*x))/(c
 + d*x)^2), x], x] /; FreeQ[{F, a, b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
&& ILtQ[m, -1]
```

Rule 2260

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/(((e_.) + (f_.)*(x_))*((g_.)
+ (h_.)*(x_))), x_Symbol] :> Dist[-d/(f*(d*g - c*h)), Subst[Int[F^(a - b*(h
/(d*g - c*h)) + d*b*(x/(d*g - c*h)))/x, x], x, (g + h*x)/(c + d*x)], x] /;
FreeQ[{F, a, b, c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$
\begin{aligned}
\int \frac{f^{\frac{c}{a+bx}}}{x^2}\,dx &= -\frac{f^{\frac{c}{a+bx}}}{x} - (bc\log(f))\int \frac{f^{\frac{c}{a+bx}}}{x(a+bx)^2}\,dx \\
&= -\frac{f^{\frac{c}{a+bx}}}{x} - (bc\log(f))\int \left(\frac{f^{\frac{c}{a+bx}}}{a^2x} - \frac{bf^{\frac{c}{a+bx}}}{a(a+bx)^2} - \frac{bf^{\frac{c}{a+bx}}}{a^2(a+bx)}\right)dx \\
&= -\frac{f^{\frac{c}{a+bx}}}{x} - \frac{(bc\log(f))\int \frac{f^{\frac{c}{a+bx}}}{x}\,dx}{a^2} + \frac{(b^2c\log(f))\int \frac{f^{\frac{c}{a+bx}}}{a+bx}\,dx}{a^2} + \frac{(b^2c\log(f))\int \frac{f^{\frac{c}{a+bx}}}{(a+bx)^2}\,dx}{a} \\
&= -\frac{bf^{\frac{c}{a+bx}}}{a} - \frac{f^{\frac{c}{a+bx}}}{x} - \frac{bc\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)\log(f)}{a^2} - \frac{(bc\log(f))\int \frac{f^{\frac{c}{a+bx}}}{x(a+bx)}\,dx}{a} - \frac{(b^2c\log(f))\int \frac{f^{\frac{c}{a+bx}}}{a+bx}\,dx}{a^2} \\
&= -\frac{bf^{\frac{c}{a+bx}}}{a} - \frac{f^{\frac{c}{a+bx}}}{x} - \frac{(bc\log(f))\text{Subst}\left(\int \frac{f^{\frac{c}{a}-\frac{bcx}{a}}}{x}\,dx, x, \frac{x}{a+bx}\right)}{a^2} \\
&= -\frac{bf^{\frac{c}{a+bx}}}{a} - \frac{f^{\frac{c}{a+bx}}}{x} - \frac{bcf^{\frac{c}{a}}\text{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)\log(f)}{a^2}
\end{aligned}
$$

Mathematica [A]
time = 0.06, size = 68, normalized size = 1.00

$$-\frac{bf^{\frac{c}{a+bx}}}{a}-\frac{f^{\frac{c}{a+bx}}}{x}-\frac{bcf^{\frac{c}{a}}\text{Ei}\left(-\frac{bcx\log(f)}{a^2+abx}\right)\log(f)}{a^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x))/x^2,x]
```

```
[Out] -((b*f^(c/(a + b*x)))/a) - f^(c/(a + b*x))/x - (b*c*f^(c/a)*ExpIntegralEi[-
((b*c*x*Log[f])/(a^2 + a*b*x))]*Log[f])/a^2
```

Maple [A]
time = 0.08, size = 80, normalized size = 1.18

method	result	size
risch	$\frac{\ln(f)bc\,f^{\frac{c}{bx+a}}}{a^2\left(\frac{c\ln(f)}{bx+a}-\frac{c\ln(f)}{a}\right)}+\frac{\ln(f)bc\,f^{\frac{c}{a}}\,\text{expIntegral}\left(1,-\frac{c\ln(f)}{bx+a}+\frac{c\ln(f)}{a}\right)}{a^2}$	80

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a))/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/a^2*ln(f)*b*c*f^(c/(b*x+a))/(c*ln(f)/(b*x+a)-c*ln(f)/a)+1/a^2*ln(f)*b*c*f
^(c/a)*Ei(1,-c*ln(f)/(b*x+a)+c*ln(f)/a)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))/x^2,x, algorithm="maxima")
```

```
[Out] integrate(f^(c/(b*x + a))/x^2, x)
```

Fricas [A]
time = 0.35, size = 60, normalized size = 0.88

$$-\frac{bcf^{\frac{c}{a}}x\text{Ei}\left(-\frac{bcx\log(f)}{abx+a^2}\right)\log\left(f\right)+\left(abx+a^2\right)f^{\frac{c}{bx+a}}}{a^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))/x^2,x, algorithm="fricas")
```

```
[Out] -(b*c*f^(c/a)*x*Ei(-b*c*x*log(f)/(a*b*x + a^2))*log(f) + (a*b*x + a^2)*f^(c
/(b*x + a)))/(a^2*x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{a+bx}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a))/x**2,x)
```

```
[Out] Integral(f**(c/(a + b*x))/x**2, x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))/x^2,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a))/x^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{f^{\frac{c}{a+b\,x}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x))/x^2,x)
```

```
[Out] int(f^(c/(a + b*x))/x^2, x)
```

3.223 $\int \frac{f^{\frac{c}{a+bx}}}{x^3}\,dx$

Optimal. Leaf size=166

$$\frac{b^2 f^{\frac{c}{a+bx}}}{2a^2}-\frac{f^{\frac{c}{a+bx}}}{2x^2}+\frac{b^2 c f^{\frac{c}{a+bx}}\log(f)}{2a^3}+\frac{bcf^{\frac{c}{a+bx}}\log(f)}{2a^2x}+\frac{b^2 c f^{\frac{c}{a}}\mathrm{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)\log(f)}{a^3}+\frac{b^2c^2 f^{\frac{c}{a}}\mathrm{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)\log^2(f)}{2a^4}$$

```
[Out] 1/2*b^2*f^(c/(b*x+a))/a^2-1/2*f^(c/(b*x+a))/x^2+1/2*b^2*c*f^(c/(b*x+a))*ln(
f)/a^3+1/2*b*c*f^(c/(b*x+a))*ln(f)/a^2/x+b^2*c*f^(c/a)*Ei(-b*c*x*ln(f)/a/(b
*x+a))*ln(f)/a^3+1/2*b^2*c^2*f^(c/a)*Ei(-b*c*x*ln(f)/a/(b*x+a))*ln(f)^2/a^4
```

Rubi [A]

time = 0.50, antiderivative size = 166, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 7, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.467$, Rules used = {2255, 6874, 2254, 2241, 2260, 2209, 2240}

$$\frac{b^2c^2\log^2(f)f^{\frac{c}{a}}\mathrm{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)}{2a^4}+\frac{b^2c\log(f)f^{\frac{c}{a}}\mathrm{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)}{a^3}+\frac{b^2c\log(f)f^{\frac{c}{a+bx}}}{2a^3}+\frac{b^2f^{\frac{c}{a+bx}}}{2a^2}+\frac{bc\log(f)f^{\frac{c}{a+bx}}}{2a^2x}-\frac{f^{\frac{c}{a+bx}}}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x))/x^3,x]
```

```
[Out] (b^2*f^(c/(a + b*x)))/(2*a^2) - f^(c/(a + b*x))/(2*x^2) + (b^2*c*f^(c/(a +
b*x))*Log[f])/(2*a^3) + (b*c*f^(c/(a + b*x))*Log[f])/(2*a^2*x) + (b^2*c*f^(
c/a)*ExpIntegralEi[-((b*c*x*Log[f])/(a*(a + b*x)))]*Log[f])/a^3 + (b^2*c^2*
f^(c/a)*ExpIntegralEi[-((b*c*x*Log[f])/(a*(a + b*x)))]*Log[f]^2)/(2*a^4)
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2254

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/((e_.) + (f_.)*(x_)), x_Symbo
l] :> Dist[d/f, Int[F^(a + b/(c + d*x))/(c + d*x), x], x] - Dist[(d*e - c*f
)/f, Int[F^(a + b/(c + d*x))/((c + d*x)*(e + f*x)), x], x] /; FreeQ[{F, a,
b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
```

Rule 2255

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))*((e_.) + (f_.)*(x_))^(m_), x_
Symbol] :> Simp[(e + f*x)^(m + 1)*(F^(a + b/(c + d*x))/(f*(m + 1))), x] + D
ist[b*d*(Log[F]/(f*(m + 1))), Int[(e + f*x)^(m + 1)*(F^(a + b/(c + d*x))/(c
 + d*x)^2), x], x] /; FreeQ[{F, a, b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
&& ILtQ[m, -1]
```

Rule 2260

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/(((e_.) + (f_.)*(x_))*((g_.)
+ (h_.)*(x_))), x_Symbol] :> Dist[-d/(f*(d*g - c*h)), Subst[Int[F^(a - b*(h
/(d*g - c*h)) + d*b*(x/(d*g - c*h)))/x, x], x, (g + h*x)/(c + d*x)], x] /;
FreeQ[{F, a, b, c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$
\begin{aligned}
\int \frac{f^{\frac{c}{a+bx}}}{x^3}\,dx &= -\frac{f^{\frac{c}{a+bx}}}{2x^2} - \frac{1}{2}(bc\log(f))\int \frac{f^{\frac{c}{a+bx}}}{x^2(a+bx)^2}\,dx \\
&= -\frac{f^{\frac{c}{a+bx}}}{2x^2} - \frac{1}{2}(bc\log(f))\int \left(\frac{f^{\frac{c}{a+bx}}}{a^2x^2} - \frac{2bf^{\frac{c}{a+bx}}}{a^3x} + \frac{b^2f^{\frac{c}{a+bx}}}{a^2(a+bx)^2} + \frac{2b^2f^{\frac{c}{a+bx}}}{a^3(a+bx)}\right)dx \\
&= -\frac{f^{\frac{c}{a+bx}}}{2x^2} - \frac{(bc\log(f))\int \frac{f^{\frac{c}{a+bx}}}{x^2}\,dx}{2a^2} + \frac{(b^2c\log(f))\int \frac{f^{\frac{c}{a+bx}}}{x}\,dx}{a^3} - \frac{(b^3c\log(f))\int \frac{f^{\frac{c}{a+bx}}}{a+bx}\,dx}{a^3} - \frac{(b^3c\log
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{b^2f^{\frac{c}{a+bx}}}{2a^2} - \frac{f^{\frac{c}{a+bx}}}{2x^2} + \frac{bcf^{\frac{c}{a+bx}}\log(f)}{2a^2x} + \frac{b^2c\,\mathrm{Ei}\left(\frac{c\log(f)}{a+bx}\right)\log(f)}{a^3} + \frac{(b^2c\log(f))\int \frac{f^{\frac{c}{a+bx}}}{x(a+bx)}\,dx}{a^2} + \frac{(b^3c\log
\\
&= \frac{b^2f^{\frac{c}{a+bx}}}{2a^2} - \frac{f^{\frac{c}{a+bx}}}{2x^2} + \frac{bcf^{\frac{c}{a+bx}}\log(f)}{2a^2x} + \frac{(b^2c\log(f))\,\mathrm{Subst}\left(\int \frac{f^{\frac{c}{a}-\frac{bcx}{a}}}{x}\,dx, x, \frac{x}{a+bx}\right)}{a^3} + \frac{(b^2c^2\log^2(f)
\\
&= \frac{b^2f^{\frac{c}{a+bx}}}{2a^2} - \frac{f^{\frac{c}{a+bx}}}{2x^2} + \frac{bcf^{\frac{c}{a+bx}}\log(f)}{2a^2x} + \frac{b^2cf^{\frac{c}{a}}\mathrm{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)\log(f)}{a^3} + \frac{(b^2c^2\log^2(f))\int \frac{f^{\frac{c}{a+bx}}}{x}\,dx}{2a^4}
\\
&= \frac{b^2f^{\frac{c}{a+bx}}}{2a^2} - \frac{f^{\frac{c}{a+bx}}}{2x^2} + \frac{b^2cf^{\frac{c}{a+bx}}\log(f)}{2a^3} + \frac{bcf^{\frac{c}{a+bx}}\log(f)}{2a^2x} + \frac{b^2cf^{\frac{c}{a}}\mathrm{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)\log(f)}{a^3} + \frac{b^2c^2\mathrm{Ei}(
\\
&= \frac{b^2f^{\frac{c}{a+bx}}}{2a^2} - \frac{f^{\frac{c}{a+bx}}}{2x^2} + \frac{b^2cf^{\frac{c}{a+bx}}\log(f)}{2a^3} + \frac{bcf^{\frac{c}{a+bx}}\log(f)}{2a^2x} + \frac{b^2cf^{\frac{c}{a}}\mathrm{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)\log(f)}{a^3} + \frac{(b^2c^2\log
\\
&= \frac{b^2f^{\frac{c}{a+bx}}}{2a^2} - \frac{f^{\frac{c}{a+bx}}}{2x^2} + \frac{b^2cf^{\frac{c}{a+bx}}\log(f)}{2a^3} + \frac{bcf^{\frac{c}{a+bx}}\log(f)}{2a^2x} + \frac{b^2cf^{\frac{c}{a}}\mathrm{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)\log(f)}{a^3} + \frac{b^2c^2f^{\frac{c}{a}}\mathrm{E}
\end{aligned}
$$

Mathematica [A]
time = 0.10, size = 115, normalized size = 0.69

$$
\frac{b^2f^{\frac{c}{a+bx}}(2a+c\log(f))}{2a^3} + \frac{b^2cf^{\frac{c}{a}}\mathrm{Ei}\left(-\frac{bcx\log(f)}{a^2+abx}\right)\log(f)(2a+c\log(f)) - \frac{a^2f^{\frac{c}{a+bx}}(a^2+b^2x^2-bcx\log(f))}{x^2}}{2a^4}
$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x))/x^3,x]
```

```
[Out] (b^2*f^(c/(a + b*x))*(2*a + c*Log[f]))/(2*a^3) + (b^2*c*f^(c/a)*ExpIntegral
Ei[-((b*c*x*Log[f])/(a^2 + a*b*x))]*Log[f]*(2*a + c*Log[f]) - (a^2*f^(c/(a
+ b*x))*(a^2 + b^2*x^2 - b*c*x*Log[f]))/x^2)/(2*a^4)
```

Maple [A]
time = 0.07, size = 226, normalized size = 1.36

method	result
risch	$-\frac{\ln(f)b^2 c\, f^{\frac{c}{bx+a}}}{a^3\left(\frac{c\ln(f)}{bx+a}-\frac{c\ln(f)}{a}\right)}-\frac{\ln(f)b^2 c\, f^{\frac{c}{a}}\,\mathrm{expIntegral}\left(1,-\frac{c\ln(f)}{bx+a}+\frac{c\ln(f)}{a}\right)}{a^3}-\frac{\ln(f)^2 b^2 c^2 f^{\frac{c}{bx+a}}}{2a^4\left(\frac{c\ln(f)}{bx+a}-\frac{c\ln(f)}{a}\right)^2}-\frac{\ln(f)^2 b^2 c^2 f^{\frac{c}{bx+a}}}{2a^4\left(\frac{c\ln(f)}{bx+a}-\frac{c\ln(f)}{a}\right)}-\frac{\ln}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a))/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] -ln(f)*b^2*c/a^3*f^(c/(b*x+a))/(c*ln(f)/(b*x+a)-c*ln(f)/a)-ln(f)*b^2*c/a^3*
f^(c/a)*Ei(1,-c*ln(f)/(b*x+a)+c*ln(f)/a)-1/2*ln(f)^2*b^2*c^2/a^4*f^(c/(b*x+
a))/(c*ln(f)/(b*x+a)-c*ln(f)/a)^2-1/2*ln(f)^2*b^2*c^2/a^4*f^(c/(b*x+a))/(c*
ln(f)/(b*x+a)-c*ln(f)/a)-1/2*ln(f)^2*b^2*c^2/a^4*f^(c/a)*Ei(1,-c*ln(f)/(b*x
+a)+c*ln(f)/a)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))/x^3,x, algorithm="maxima")
```

```
[Out] integrate(f^(c/(b*x + a))/x^3, x)
```

Fricas [A]
time = 0.35, size = 110, normalized size = 0.66

$$\frac{\left(b^2c^2x^2\log\left(f\right)^2+2\,ab^2cx^2\log\left(f\right)\right)f^{\frac{c}{a}}\,\mathrm{Ei}\left(-\frac{bcx\log(f)}{abx+a^2}\right)+\left(a^2b^2x^2-a^4+\left(ab^2cx^2+a^2bcx\right)\log\left(f\right)\right)f^{\frac{c}{bx+a}}}{2\,a^4x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))/x^3,x, algorithm="fricas")
```

```
[Out] 1/2*((b^2*c^2*x^2*log(f)^2 + 2*a*b^2*c*x^2*log(f))*f^(c/a)*Ei(-b*c*x*log(f)
/(a*b*x + a^2)) + (a^2*b^2*x^2 - a^4 + (a*b^2*c*x^2 + a^2*b*c*x)*log(f))*f^
(c/(b*x + a)))/(a^4*x^2)
```

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

$$\int \frac{f^{\frac{c}{a+bx}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a))/x**3,x)
```

```
[Out] Integral(f**(c/(a + b*x))/x**3, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))/x^3,x, algorithm="giac")
[Out] integrate(f^(c/(b*x + a))/x^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{f^{\frac{c}{a+b\,x}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x))/x^3,x)
[Out] int(f^(c/(a + b*x))/x^3, x)
```

3.224 $\int f^{\frac{c}{(a+bx)^2}} x^4 \, dx$

Optimal. Leaf size=415

$$\frac{a^4 f^{\frac{c}{(a+bx)^2}} (a+bx)}{b^5} - \frac{2a^3 f^{\frac{c}{(a+bx)^2}} (a+bx)^2}{b^5} + \frac{2a^2 f^{\frac{c}{(a+bx)^2}} (a+bx)^3}{b^5} - \frac{a f^{\frac{c}{(a+bx)^2}} (a+bx)^4}{b^5} + \frac{f^{\frac{c}{(a+bx)^2}} (a+bx)^5}{5b^5} - \frac{a^4}{\ }$$

```
[Out] a^4*f^(c/(b*x+a)^2)*(b*x+a)/b^5-2*a^3*f^(c/(b*x+a)^2)*(b*x+a)^2/b^5+2*a^2*f
^(c/(b*x+a)^2)*(b*x+a)^3/b^5-a*f^(c/(b*x+a)^2)*(b*x+a)^4/b^5+1/5*f^(c/(b*x+
a)^2)*(b*x+a)^5/b^5+4*a^2*c*f^(c/(b*x+a)^2)*(b*x+a)*ln(f)/b^5-a*c*f^(c/(b*x
+a)^2)*(b*x+a)^2*ln(f)/b^5+2/15*c*f^(c/(b*x+a)^2)*(b*x+a)^3*ln(f)/b^5+2*a^3
*c*Ei(c*ln(f)/(b*x+a)^2)*ln(f)/b^5+4/15*c^2*f^(c/(b*x+a)^2)*(b*x+a)*ln(f)^2
/b^5+a*c^2*Ei(c*ln(f)/(b*x+a)^2)*ln(f)^2/b^5-4*a^2*c^(3/2)*erfi(c^(1/2)*ln(
f)^(1/2)/(b*x+a))*ln(f)^(3/2)*Pi^(1/2)/b^5-4/15*c^(5/2)*erfi(c^(1/2)*ln(f)^
(1/2)/(b*x+a))*ln(f)^(5/2)*Pi^(1/2)/b^5-a^4*erfi(c^(1/2)*ln(f)^(1/2)/(b*x+a
))*c^(1/2)*Pi^(1/2)*ln(f)^(1/2)/b^5
```

Rubi [A]

time = 0.32, antiderivative size = 415, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.400$, Rules used = {2258, 2237, 2242, 2235, 2245, 2241}

$$-\frac{\sqrt{\pi} a^4 \sqrt{c} \sqrt{\log(f)} \text{Erfi}\left(\frac{\sqrt{c}\sqrt{\log(f)}}{a+bx}\right)}{b^5} + \frac{a^4(a+bx) f^{\frac{c}{(a+bx)^2}}}{b^5} + \frac{2a^3 c \log(f) \text{Ei}\left(\frac{c\log(f)}{(a+bx)^2}\right)}{b^5} - \frac{2a^3(a+bx)^2 f^{\frac{c}{(a+bx)^2}}}{b^5} - \frac{4\sqrt{\pi} a^2 c^{3/2} \log^{\frac{3}{2}}(f) \text{Erfi}\left(\frac{\sqrt{c}\sqrt{\log(f)}}{a+bx}\right)}{b^5} + \frac{2a^2(a+bx)^3 f^{\frac{c}{(a+bx)^2}}}{b^5} + \frac{4a^2 c \log(f)(a+bx) f^{\frac{c}{(a+bx)^2}}}{b^5} - \frac{4\sqrt{\pi} c^{5/2} \log^{\frac{5}{2}}(f) \text{Erfi}\left(\frac{\sqrt{c}\sqrt{\log(f)}}{a+bx}\right)}{15b^5} + \frac{a c^2 \log^2(f) \text{Ei}\left(\frac{c\log(f)}{(a+bx)^2}\right)}{b^5} + \frac{4c^2 \log^2(f)(a+bx) f^{\frac{c}{(a+bx)^2}}}{15b^5} + \frac{(a+bx)^5 f^{\frac{c}{(a+bx)^2}}}{5b^5} - \frac{a(a+bx)^4 f^{\frac{c}{(a+bx)^2}}}{b^5} + \frac{2c\log(f)(a+bx)^3 f^{\frac{c}{(a+bx)^2}}}{15b^5} - \frac{a c \log(f)(a+bx)^2 f^{\frac{c}{(a+bx)^2}}}{b^5}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x)^2)*x^4,x]
```

```
[Out] (a^4*f^(c/(a + b*x)^2)*(a + b*x))/b^5 - (2*a^3*f^(c/(a + b*x)^2)*(a + b*x)^
2)/b^5 + (2*a^2*f^(c/(a + b*x)^2)*(a + b*x)^3)/b^5 - (a*f^(c/(a + b*x)^2)*(
a + b*x)^4)/b^5 + (f^(c/(a + b*x)^2)*(a + b*x)^5)/(5*b^5) - (a^4*Sqrt[c]*Sq
rt[Pi]*Erfi[(Sqrt[c]*Sqrt[Log[f]])/(a + b*x)]*Sqrt[Log[f]])/b^5 + (4*a^2*c*
f^(c/(a + b*x)^2)*(a + b*x)*Log[f])/b^5 - (a*c*f^(c/(a + b*x)^2)*(a + b*x)^
2*Log[f])/b^5 + (2*c*f^(c/(a + b*x)^2)*(a + b*x)^3*Log[f])/(15*b^5) + (2*a^
3*c*ExpIntegralEi[(c*Log[f])/(a + b*x)^2]*Log[f])/b^5 - (4*a^2*c^(3/2)*Sqrt
[Pi]*Erfi[(Sqrt[c]*Sqrt[Log[f]])/(a + b*x)]*Log[f]^(3/2))/b^5 + (4*c^2*f^(c
/(a + b*x)^2)*(a + b*x)*Log[f]^2)/(15*b^5) + (a*c^2*ExpIntegralEi[(c*Log[f]
)/(a + b*x)^2]*Log[f]^2)/b^5 - (4*c^(5/2)*Sqrt[Pi]*Erfi[(Sqrt[c]*Sqrt[Log[f
]])/(a + b*x)]*Log[f]^(5/2))/(15*b^5)
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{\frac{c}{(a+bx)^2}} x^4\,dx = \int \left(\frac{a^4 f^{\frac{c}{(a+bx)^2}}}{b^4} - \frac{4a^3 f^{\frac{c}{(a+bx)^2}} (a+bx)}{b^4} + \frac{6a^2 f^{\frac{c}{(a+bx)^2}} (a+bx)^2}{b^4} - \frac{4a f^{\frac{c}{(a+bx)^2}} (a+bx)^3}{b^4} + f^{(\cdots} \right.$$

$$= \frac{\int f^{\frac{c}{(a+bx)^2}} (a+bx)^4\,dx}{b^4} - \frac{(4a)\int f^{\frac{c}{(a+bx)^2}} (a+bx)^3\,dx}{b^4} + \frac{(6a^2)\int f^{\frac{c}{(a+bx)^2}} (a+bx)^2\,dx}{b^4} - \frac{(4a \cdots}{}$$

$$= \frac{a^4 f^{\frac{c}{(a+bx)^2}} (a+bx)}{b^5} - \frac{2a^3 f^{\frac{c}{(a+bx)^2}} (a+bx)^2}{b^5} + \frac{2a^2 f^{\frac{c}{(a+bx)^2}} (a+bx)^3}{b^5} - \frac{a f^{\frac{c}{(a+bx)^2}} (a+bx)^4}{b^5} + \cdots$$

$$= \frac{a^4 f^{\frac{c}{(a+bx)^2}} (a+bx)}{b^5} - \frac{2a^3 f^{\frac{c}{(a+bx)^2}} (a+bx)^2}{b^5} + \frac{2a^2 f^{\frac{c}{(a+bx)^2}} (a+bx)^3}{b^5} - \frac{a f^{\frac{c}{(a+bx)^2}} (a+bx)^4}{b^5} + \cdots$$

$$= \frac{a^4 f^{\frac{c}{(a+bx)^2}} (a+bx)}{b^5} - \frac{2a^3 f^{\frac{c}{(a+bx)^2}} (a+bx)^2}{b^5} + \frac{2a^2 f^{\frac{c}{(a+bx)^2}} (a+bx)^3}{b^5} - \frac{a f^{\frac{c}{(a+bx)^2}} (a+bx)^4}{b^5} + \cdots$$

$$= \frac{a^4 f^{\frac{c}{(a+bx)^2}} (a+bx)}{b^5} - \frac{2a^3 f^{\frac{c}{(a+bx)^2}} (a+bx)^2}{b^5} + \frac{2a^2 f^{\frac{c}{(a+bx)^2}} (a+bx)^3}{b^5} - \frac{a f^{\frac{c}{(a+bx)^2}} (a+bx)^4}{b^5} + \cdots$$

$$= \frac{a^4 f^{\frac{c}{(a+bx)^2}} (a+bx)}{b^5} - \frac{2a^3 f^{\frac{c}{(a+bx)^2}} (a+bx)^2}{b^5} + \frac{2a^2 f^{\frac{c}{(a+bx)^2}} (a+bx)^3}{b^5} - \frac{a f^{\frac{c}{(a+bx)^2}} (a+bx)^4}{b^5} + \cdots$$

Mathematica [A]
time = 0.16, size = 195, normalized size = 0.47

$$\frac{a f^{\frac{c}{(a+bx)^2}} \left(3a^4+47a^2 c\log(f)+4c^2\log^2(f)\right)}{15b^5} + \frac{15ac\,\mathrm{Ei}\left(\frac{c\log(f)}{(a+bx)^2}\right)\log(f)\left(2a^2+c\log(f)\right) - \sqrt{c}\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{c}\,\sqrt{\log(f)}}{a+bx}\right)\sqrt{\log(f)}\left(15a^4+60a^2c\log(f)+4c^2\log^2(f)\right) + bf^{\frac{c}{(a+bx)^2}} x\left(3b^4x^4+c\left(36a^2-9abx+2b^2x^2\right)\log(f)+4c^2\log^2(f)\right)}{15b^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x)^2)*x^4,x]
```

```
[Out] (a*f^(c/(a + b*x)^2)*(3*a^4 + 47*a^2*c*Log[f] + 4*c^2*Log[f]^2))/(15*b^5) +
 (15*a*c*ExpIntegralEi[(c*Log[f])/(a + b*x)^2]*Log[f]*(2*a^2 + c*Log[f]) -
Sqrt[c]*Sqrt[Pi]*Erfi[(Sqrt[c]*Sqrt[Log[f]])/(a + b*x)]*Sqrt[Log[f]]*(15*a^
4 + 60*a^2*c*Log[f] + 4*c^2*Log[f]^2) + b*f^(c/(a + b*x)^2)*x*(3*b^4*x^4 +
c*(36*a^2 - 9*a*b*x + 2*b^2*x^2)*Log[f] + 4*c^2*Log[f]^2))/(15*b^5)
```

Maple [A]
time = 0.06, size = 343, normalized size = 0.83

method	result

risch	$-\frac{3\ln(f)c f^{\frac{c}{(bx+a)^2}} a x^2}{5b^3}+\frac{12\ln(f)c f^{\frac{c}{(bx+a)^2}} a^2 x}{5b^4}-\frac{a^4\ln(f)c\sqrt{\pi}\,\operatorname{erf}\left(\frac{\sqrt{-c\ln(f)}}{bx+a}\right)}{b^5\sqrt{-c\ln(f)}}-\frac{4a^2\ln(f)^2c^2\sqrt{\pi}\,\operatorname{erf}\left(\frac{\sqrt{-c}}{bx}\right.}{b^5\sqrt{-c\ln(f)}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a)^2)*x^4,x,method=_RETURNVERBOSE)
```

```
[Out] -3/5/b^3*ln(f)*c*f^(c/(b*x+a)^2)*a*x^2+12/5/b^4*ln(f)*c*f^(c/(b*x+a)^2)*a^2
*x-1/b^5*a^4*ln(f)*c*Pi^(1/2)/(-c*ln(f))^(1/2)*erf((-c*ln(f))^(1/2)/(b*x+a)
)-4/b^5*a^2*ln(f)^2*c^2*Pi^(1/2)/(-c*ln(f))^(1/2)*erf((-c*ln(f))^(1/2)/(b*x
+a))-2/b^5*a^3*ln(f)*c*Ei(1,-c*ln(f)/(b*x+a)^2)-1/b^5*a*ln(f)^2*c^2*Ei(1,-c
*ln(f)/(b*x+a)^2)+1/5*f^(c/(b*x+a)^2)*x^5+1/5/b^5*a^5*f^(c/(b*x+a)^2)+2/15/
b^2*ln(f)*c*f^(c/(b*x+a)^2)*x^3+4/15/b^4*ln(f)^2*c^2*f^(c/(b*x+a)^2)*x-4/15
/b^5*ln(f)^3*c^3*Pi^(1/2)/(-c*ln(f))^(1/2)*erf((-c*ln(f))^(1/2)/(b*x+a))+47
/15/b^5*ln(f)*c*f^(c/(b*x+a)^2)*a^3+4/15/b^5*ln(f)^2*c^2*f^(c/(b*x+a)^2)*a
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x^4,x, algorithm="maxima")
```

```
[Out] 1/15*(3*b^4*x^5 + 2*b^2*c*x^3*log(f) - 9*a*b*c*x^2*log(f) + 4*(9*a^2*c*log(
f) + c^2*log(f)^2)*x)*f^(c/(b^2*x^2 + 2*a*b*x + a^2))/b^4 - integrate(2/15*
(18*a^5*c*log(f) + 2*a^3*c^2*log(f)^2 + 15*(2*a^3*b^2*c*log(f) + a*b^2*c^2*
log(f)^2)*x^2 + (45*a^4*b*c*log(f) - 30*a^2*b*c^2*log(f)^2 - 4*b*c^3*log(f)
^3)*x)*f^(c/(b^2*x^2 + 2*a*b*x + a^2))/(b^7*x^3 + 3*a*b^6*x^2 + 3*a^2*b^5*x
 + a^3*b^4), x)
```

Fricas [A]
time = 0.40, size = 201, normalized size = 0.48

$$\frac{\sqrt{\pi}\,\left(15\,a^4b+60\,a^2bc\log\left(f\right)+4\,bc^2\log\left(f\right)^2\right)\sqrt{-\frac{c\log\left(f\right)}{b^2}}\,\operatorname{erf}\left(\frac{b\sqrt{-\frac{c\log\left(f\right)}{b^2}}}{bx+a}\right)+\left(3\,b^5x^5+3\,a^5+4\,\left(bc^2x+ac^2\right)\log\left(f\right)^2+\left(2\,b^3cx^3-9\,ab^2cx^2+36\,a^2bcx+47\,a^3c\right)\log\left(f\right)\right)f^{\frac{c}{b^2x^2+2\,abx+a^2}}+15\,\left(2\,a^3c\log\left(f\right)+ac^2\log\left(f\right)^2\right)\operatorname{Ei}\left(\frac{c\log(f)}{b^2x^2+2\,abx+a^2}\right)}{15\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x^4,x, algorithm="fricas")
```

```
[Out] 1/15*(sqrt(pi)*(15*a^4*b + 60*a^2*b*c*log(f) + 4*b*c^2*log(f)^2)*sqrt(-c*lo
g(f)/b^2)*erf(b*sqrt(-c*log(f)/b^2)/(b*x + a)) + (3*b^5*x^5 + 3*a^5 + 4*(b*
c^2*x + a*c^2)*log(f)^2 + (2*b^3*c*x^3 - 9*a*b^2*c*x^2 + 36*a^2*b*c*x + 47*
```

```
a^3*c)*log(f))*f^(c/(b^2*x^2 + 2*a*b*x + a^2)) + 15*(2*a^3*c*log(f) + a*c^2
*log(f)^2)*Ei(c*log(f)/(b^2*x^2 + 2*a*b*x + a^2)))/b^5
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(a+bx)^2}} x^4\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**2)*x**4,x)
[Out] Integral(f**(c/(a + b*x)**2)*x**4, x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x^4,x, algorithm="giac")
[Out] integrate(f^(c/(b*x + a)^2)*x^4, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int f^{\frac{c}{(a+b\,x)^2}}\, x^4\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^2)*x^4,x)
[Out] int(f^(c/(a + b*x)^2)*x^4, x)
```

3.225 $\int f^{\frac{c}{(a+bx)^2}} x^3 \, dx$

Optimal. Leaf size=291

$$-\frac{a^3 f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^4}+\frac{3a^2 f^{\frac{c}{(a+bx)^2}}(a+bx)^2}{2b^4}-\frac{a f^{\frac{c}{(a+bx)^2}}(a+bx)^3}{b^4}+\frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^4}{4b^4}+\frac{a^3\sqrt{c}\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{c}\,\sqrt{\log}}{a+bx}\right.}{b^4}$$

```
[Out] -a^3*f^(c/(b*x+a)^2)*(b*x+a)/b^4+3/2*a^2*f^(c/(b*x+a)^2)*(b*x+a)^2/b^4-a*f^
(c/(b*x+a)^2)*(b*x+a)^3/b^4+1/4*f^(c/(b*x+a)^2)*(b*x+a)^4/b^4-2*a*c*f^(c/(b
*x+a)^2)*(b*x+a)*ln(f)/b^4+1/4*c*f^(c/(b*x+a)^2)*(b*x+a)^2*ln(f)/b^4-3/2*a^
2*c*Ei(c*ln(f)/(b*x+a)^2)*ln(f)/b^4-1/4*c^2*Ei(c*ln(f)/(b*x+a)^2)*ln(f)^2/b
^4+2*a*c^(3/2)*erfi(c^(1/2)*ln(f)^(1/2)/(b*x+a))*ln(f)^(3/2)*Pi^(1/2)/b^4+a
^3*erfi(c^(1/2)*ln(f)^(1/2)/(b*x+a))*c^(1/2)*Pi^(1/2)*ln(f)^(1/2)/b^4
```

Rubi [A]
time = 0.22, antiderivative size = 291, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.400$, Rules used = {2258, 2237, 2242, 2235, 2245, 2241}

$$\frac{\sqrt{\pi}\,a^3\sqrt{c}\,\sqrt{\log(f)}\,\mathrm{Erfi}\left(\frac{\sqrt{c}\,\sqrt{\log(f)}}{a+bx}\right)}{b^4}-\frac{a^3(a+bx)f^{\frac{c}{(a+bx)^2}}}{b^4}-\frac{3a^2c\log(f)\mathrm{Ei}\left(\frac{c\log(f)}{(a+bx)^2}\right)}{2b^4}+\frac{3a^2(a+bx)^2f^{\frac{c}{(a+bx)^2}}}{2b^4}+\frac{2\sqrt{\pi}\,ac^{3/2}\log^{\frac{3}{2}}(f)\mathrm{Erfi}\left(\frac{\sqrt{c}\,\sqrt{\log(f)}}{a+bx}\right)}{b^4}-\frac{c^2\log^2(f)\mathrm{Ei}\left(\frac{c\log(f)}{(a+bx)^2}\right)}{4b^4}+\frac{(a+bx)^4f^{\frac{c}{(a+bx)^2}}}{4b^4}-\frac{a(a+bx)^3f^{\frac{c}{(a+bx)^2}}}{b^4}+\frac{c\log(f)(a+bx)^2f^{\frac{c}{(a+bx)^2}}}{4b^4}-\frac{2ac\log(f)(a+bx)f^{\frac{c}{(a+bx)^2}}}{b^4}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x)^2)*x^3,x]
```

```
[Out] -((a^3*f^(c/(a + b*x)^2)*(a + b*x))/b^4) + (3*a^2*f^(c/(a + b*x)^2)*(a + b*
x)^2)/(2*b^4) - (a*f^(c/(a + b*x)^2)*(a + b*x)^3)/b^4 + (f^(c/(a + b*x)^2)*
(a + b*x)^4)/(4*b^4) + (a^3*Sqrt[c]*Sqrt[Pi]*Erfi[(Sqrt[c]*Sqrt[Log[f]])/(a
 + b*x)]*Sqrt[Log[f]])/b^4 - (2*a*c*f^(c/(a + b*x)^2)*(a + b*x)*Log[f])/b^4
 + (c*f^(c/(a + b*x)^2)*(a + b*x)^2*Log[f])/(4*b^4) - (3*a^2*c*ExpIntegralE
i[(c*Log[f])/(a + b*x)^2]*Log[f])/(2*b^4) + (2*a*c^(3/2)*Sqrt[Pi]*Erfi[(Sqr
t[c]*Sqrt[Log[f]])/(a + b*x)]*Log[f]^(3/2))/b^4 - (c^2*ExpIntegralEi[(c*Log
[f])/(a + b*x)^2]*Log[f]^2)/(4*b^4)
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
```

```
LtQ[n, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{\frac{c}{(a+bx)^2}}x^3\,dx=\int\left(-\frac{a^3f^{\frac{c}{(a+bx)^2}}}{b^3}+\frac{3a^2f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^3}-\frac{3af^{\frac{c}{(a+bx)^2}}(a+bx)^2}{b^3}+\frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^3}{b^3}\right)dx$$

$$=\frac{\int f^{\frac{c}{(a+bx)^2}}(a+bx)^3\,dx}{b^3}-\frac{(3a)\int f^{\frac{c}{(a+bx)^2}}(a+bx)^2\,dx}{b^3}+\frac{(3a^2)\int f^{\frac{c}{(a+bx)^2}}(a+bx)\,dx}{b^3}-\frac{a^3\int f}{}$$

$$=-\frac{a^3f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^4}+\frac{3a^2f^{\frac{c}{(a+bx)^2}}(a+bx)^2}{2b^4}-\frac{af^{\frac{c}{(a+bx)^2}}(a+bx)^3}{b^4}+\frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^4}{4b^4}+\frac{(c}{}$$

$$=-\frac{a^3f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^4}+\frac{3a^2f^{\frac{c}{(a+bx)^2}}(a+bx)^2}{2b^4}-\frac{af^{\frac{c}{(a+bx)^2}}(a+bx)^3}{b^4}+\frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^4}{4b^4}-\frac{2c}{}$$

$$=-\frac{a^3f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^4}+\frac{3a^2f^{\frac{c}{(a+bx)^2}}(a+bx)^2}{2b^4}-\frac{af^{\frac{c}{(a+bx)^2}}(a+bx)^3}{b^4}+\frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^4}{4b^4}+\frac{a^3}{}$$

$$=-\frac{a^3f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^4}+\frac{3a^2f^{\frac{c}{(a+bx)^2}}(a+bx)^2}{2b^4}-\frac{af^{\frac{c}{(a+bx)^2}}(a+bx)^3}{b^4}+\frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^4}{4b^4}+\frac{a^3}{}$$

Mathematica [A]
time = 0.11, size = 148, normalized size = 0.51

$$-\frac{a^2f^{\frac{c}{(a+bx)^2}}(a^2+7c\log(f))}{4b^4}+\frac{-c\,\mathrm{Ei}\left(\frac{c\log(f)}{(a+bx)^2}\right)\log(f)\,(6a^2+c\log(f))+4a\sqrt{c}\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{c}\,\sqrt{\log(f)}}{a+bx}\right)\sqrt{\log(f)}\,(a^2+2c\log(f))+bf^{\frac{c}{(a+bx)^2}}x(b^3x^3-6ac\log(f)+bcx\log(f))}{4b^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x)^2)*x^3,x]
```

```
[Out] -1/4*(a^2*f^(c/(a + b*x)^2)*(a^2 + 7*c*Log[f]))/b^4 + (-(c*ExpIntegralEi[(c
*Log[f])/(a + b*x)^2]*Log[f]*(6*a^2 + c*Log[f])) + 4*a*Sqrt[c]*Sqrt[Pi]*Erf
i[(Sqrt[c]*Sqrt[Log[f]])/(a + b*x)]*Sqrt[Log[f]]*(a^2 + 2*c*Log[f]) + b*f^(
c/(a + b*x)^2)*x*(b^3*x^3 - 6*a*c*Log[f] + b*c*x*Log[f]))/(4*b^4)
```

Maple [A]
time = 0.04, size = 228, normalized size = 0.78

method	result
risch	$\frac{f^{\frac{c}{(bx+a)^2}}x^4}{4}-\frac{f^{\frac{c}{(bx+a)^2}}a^4}{4b^4}+\frac{\ln(f)cf^{\frac{c}{(bx+a)^2}}x^2}{4b^2}-\frac{3\ln(f)cf^{\frac{c}{(bx+a)^2}}ax}{2b^3}-\frac{7\ln(f)cf^{\frac{c}{(bx+a)^2}}a^2}{4b^4}+\frac{\ln(f)^2c^2\,\mathrm{expIntegral}\left(1,-\right.}{4b^4}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a)^2)*x^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/4*f^(c/(b*x+a)^2)*x^4-1/4/b^4*f^(c/(b*x+a)^2)*a^4+1/4/b^2*ln(f)*c*f^(c/(b
*x+a)^2)*x^2-3/2/b^3*ln(f)*c*f^(c/(b*x+a)^2)*a*x-7/4/b^4*ln(f)*c*f^(c/(b*x+
a)^2)*a^2+1/4/b^4*ln(f)^2*c^2*Ei(1,-c*ln(f)/(b*x+a)^2)+2/b^4*a*ln(f)^2*c^2*
Pi^(1/2)/(-c*ln(f))^(1/2)*erf((-c*ln(f))^(1/2)/(b*x+a))+3/2/b^4*a^2*ln(f)*c
*Ei(1,-c*ln(f)/(b*x+a)^2)+1/b^4*a^3*ln(f)*c*Pi^(1/2)/(-c*ln(f))^(1/2)*erf((
-c*ln(f))^(1/2)/(b*x+a))
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*(b^3*x^4 + b*c*x^2*log(f) - 6*a*c*x*log(f))*f^(c/(b^2*x^2 + 2*a*b*x + a
^2))/b^3 + integrate(1/2*(3*a^4*c*log(f) + (6*a^2*b^2*c*log(f) + b^2*c^2*lo
g(f)^2)*x^2 + 2*(4*a^3*b*c*log(f) - 3*a*b*c^2*log(f)^2)*x)*f^(c/(b^2*x^2 +
2*a*b*x + a^2))/(b^6*x^3 + 3*a*b^5*x^2 + 3*a^2*b^4*x + a^3*b^3), x)
```

Fricas [A]
time = 0.37, size = 156, normalized size = 0.54

$$-\frac{4\,\sqrt{\pi}\,(a^3b+2\,abc\log(f))\sqrt{-\frac{c\log(f)}{b^2}}\,\mathrm{erf}\left(\frac{b\sqrt{-\frac{c\log(f)}{b^2}}}{bx+a}\right)-(b^4x^4-a^4+(b^2cx^2-6\,abcx-7\,a^2c)\log(f))f^{\frac{c}{b^2x^2+2\,abx+a^2}}+(6\,a^2c\log(f)+c^2\log(f)^2)\mathrm{Ei}\left(\frac{c\log(f)}{b^2x^2+2\,abx+a^2}\right)}{4\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/4*(4*sqrt(pi)*(a^3*b + 2*a*b*c*log(f))*sqrt(-c*log(f)/b^2)*erf(b*sqrt(-c
*log(f)/b^2)/(b*x + a)) - (b^4*x^4 - a^4 + (b^2*c*x^2 - 6*a*b*c*x - 7*a^2*c
)*log(f))*f^(c/(b^2*x^2 + 2*a*b*x + a^2)) + (6*a^2*c*log(f) + c^2*log(f)^2)
*Ei(c*log(f)/(b^2*x^2 + 2*a*b*x + a^2)))/b^4
```

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

$$\int f^{\frac{c}{(a+bx)^2}}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**2)*x**3,x)
```

```
[Out] Integral(f**(c/(a + b*x)**2)*x**3, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^(c/(b*x + a)^2)*x^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int f^{\frac{c}{(a+b\,x)^2}}\,x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^2)*x^3,x)
```

```
[Out] int(f^(c/(a + b*x)^2)*x^3, x)
```

3.226 $\int f^{\frac{c}{(a+bx)^2}} x^2 \, dx$

Optimal. Leaf size=206

$$\frac{a^2 f^{\frac{c}{(a+bx)^2}} (a+bx)}{b^3} - \frac{a f^{\frac{c}{(a+bx)^2}} (a+bx)^2}{b^3} + \frac{f^{\frac{c}{(a+bx)^2}} (a+bx)^3}{3b^3} - \frac{a^2 \sqrt{c} \sqrt{\pi} \operatorname{erfi}\left(\frac{\sqrt{c} \sqrt{\log(f)}}{a+bx}\right) \sqrt{\log(f)}}{b^3} + \frac{2cf}{}$$

[Out] a^2*f^(c/(b*x+a)^2)*(b*x+a)/b^3-a*f^(c/(b*x+a)^2)*(b*x+a)^2/b^3+1/3*f^(c/(b*x+a)^2)*(b*x+a)^3/b^3+2/3*c*f^(c/(b*x+a)^2)*(b*x+a)*ln(f)/b^3+a*c*Ei(c*ln(f)/(b*x+a)^2)*ln(f)/b^3-2/3*c^(3/2)*erfi(c^(1/2)*ln(f)^(1/2)/(b*x+a))*ln(f)^(3/2)*Pi^(1/2)/b^3-a^2*erfi(c^(1/2)*ln(f)^(1/2)/(b*x+a))*c^(1/2)*Pi^(1/2)*ln(f)^(1/2)/b^3

Rubi [A]
time = 0.15, antiderivative size = 206, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.400$, Rules used = {2258, 2237, 2242, 2235, 2245, 2241}

$$-\frac{\sqrt{\pi} a^2 \sqrt{c} \sqrt{\log(f)} \operatorname{Erfi}\left(\frac{\sqrt{c} \sqrt{\log(f)}}{a+bx}\right)}{b^3} + \frac{a^2 (a+bx) f^{\frac{c}{(a+bx)^2}}}{b^3} - \frac{2\sqrt{\pi} c^{3/2} \log^{\frac{3}{2}}(f) \operatorname{Erfi}\left(\frac{\sqrt{c} \sqrt{\log(f)}}{a+bx}\right)}{3b^3} + \frac{ac \log(f) \operatorname{Ei}\left(\frac{c \log(f)}{(a+bx)^2}\right)}{b^3} + \frac{(a+bx)^3 f^{\frac{c}{(a+bx)^2}}}{3b^3} - \frac{a(a+bx)^2 f^{\frac{c}{(a+bx)^2}}}{b^3} + \frac{2c \log(f) (a+bx) f^{\frac{c}{(a+bx)^2}}}{3b^3}$$

Antiderivative was successfully verified.

[In] Int[f^(c/(a + b*x)^2)*x^2,x]

[Out] (a^2*f^(c/(a + b*x)^2)*(a + b*x))/b^3 - (a*f^(c/(a + b*x)^2)*(a + b*x)^2)/b^3 + (f^(c/(a + b*x)^2)*(a + b*x)^3)/(3*b^3) - (a^2*Sqrt[c]*Sqrt[Pi]*Erfi[(Sqrt[c]*Sqrt[Log[f]])/(a + b*x)]*Sqrt[Log[f]])/b^3 + (2*c*f^(c/(a + b*x)^2)*(a + b*x)*Log[f])/(3*b^3) + (a*c*ExpIntegralEi[(c*Log[f])/(a + b*x)^2]*Log[f])/b^3 - (2*c^(3/2)*Sqrt[Pi]*Erfi[(Sqrt[c]*Sqrt[Log[f]])/(a + b*x)]*Log[f]^(3/2))/(3*b^3)

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{F, a, b, c, d}, x] && PosQ[b]
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c + d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a + b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && ILtQ[n, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{\frac{c}{(a+bx)^2}}x^2\,dx = \int \left(\frac{a^2 f^{\frac{c}{(a+bx)^2}}}{b^2} - \frac{2af^{\frac{c}{(a+bx)^2}}(a+bx)}{b^2} + \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^2}{b^2}\right) dx$$

$$= \frac{\int f^{\frac{c}{(a+bx)^2}}(a+bx)^2\,dx}{b^2} - \frac{(2a)\int f^{\frac{c}{(a+bx)^2}}(a+bx)\,dx}{b^2} + \frac{a^2\int f^{\frac{c}{(a+bx)^2}}\,dx}{b^2}$$

$$= \frac{a^2 f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^3} - \frac{af^{\frac{c}{(a+bx)^2}}(a+bx)^2}{b^3} + \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^3}{3b^3} + \frac{(2c\log(f))\int f^{\frac{c}{(a+bx)^2}}\,dx}{3b^2} -$$

$$= \frac{a^2 f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^3} - \frac{af^{\frac{c}{(a+bx)^2}}(a+bx)^2}{b^3} + \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^3}{3b^3} + \frac{2cf^{\frac{c}{(a+bx)^2}}(a+bx)\log(f)}{3b^3} +$$

$$= \frac{a^2 f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^3} - \frac{af^{\frac{c}{(a+bx)^2}}(a+bx)^2}{b^3} + \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^3}{3b^3} - \frac{a^2\sqrt{c}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{c}\sqrt{\log(}}{a+bx}\right.}{b^3}$$

$$= \frac{a^2 f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^3} - \frac{af^{\frac{c}{(a+bx)^2}}(a+bx)^2}{b^3} + \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^3}{3b^3} - \frac{a^2\sqrt{c}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{c}\sqrt{\log(}}{a+bx}\right.}{b^3}$$

Mathematica [**A**]
time = 0.08, size = 131, normalized size = 0.64

$$\frac{af^{\frac{c}{(a+bx)^2}}\left(a^2+2c\log(f)\right)}{3b^3}+\frac{3ac\text{Ei}\left(\frac{c\log(f)}{(a+bx)^2}\right)\log(f)-\sqrt{c}\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{c}\sqrt{\log(f)}}{a+bx}\right)\sqrt{\log(f)}\left(3a^2+2c\log(f)\right)+bf^{\frac{c}{(a+bx)^2}}x\left(b^2x^2+2c\log(f)\right)}{3b^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x)^2)*x^2,x]
```

```
[Out] (a*f^(c/(a + b*x)^2)*(a^2 + 2*c*Log[f]))/(3*b^3) + (3*a*c*ExpIntegralEi[(c*
Log[f])/(a + b*x)^2]*Log[f] - Sqrt[c]*Sqrt[Pi]*Erfi[(Sqrt[c]*Sqrt[Log[f]])/
(a + b*x)]*Sqrt[Log[f]]*(3*a^2 + 2*c*Log[f]) + b*f^(c/(a + b*x)^2)*x*(b^2*x
^2 + 2*c*Log[f]))/(3*b^3)
```

Maple [**A**]
time = 0.03, size = 175, normalized size = 0.85

method	result
risch	$\frac{f^{\frac{c}{(bx+a)^2}}x^3}{3}+\frac{a^3f^{\frac{c}{(bx+a)^2}}}{3b^3}+\frac{2\ln(f)cf^{\frac{c}{(bx+a)^2}}x}{3b^2}+\frac{2\ln(f)cf^{\frac{c}{(bx+a)^2}}a}{3b^3}-\frac{2\ln(f)^2c^2\sqrt{\pi}\,\text{erf}\left(\frac{\sqrt{-c\ln(f)}}{bx+a}\right)}{3b^3\sqrt{-c\ln(f)}}-$ $a^2 \ln$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a)^2)*x^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*f^(c/(b*x+a)^2)*x^3+1/3/b^3*a^3*f^(c/(b*x+a)^2)+2/3/b^2*ln(f)*c*f^(c/(b
*x+a)^2)*x+2/3/b^3*ln(f)*c*f^(c/(b*x+a)^2)*a-2/3/b^3*ln(f)^2*c^2*Pi^(1/2)/(
-c*ln(f))^(1/2)*erf((-c*ln(f))^(1/2)/(b*x+a))-1/b^3*a^2*ln(f)*c*Pi^(1/2)/(-
c*ln(f))^(1/2)*erf((-c*ln(f))^(1/2)/(b*x+a))-1/b^3*a*ln(f)*c*Ei(1,-c*ln(f)/
(b*x+a)^2)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x^2,x, algorithm="maxima")
```

```
[Out] 1/3*(b^2*x^3 + 2*c*x*log(f))*f^(c/(b^2*x^2 + 2*a*b*x + a^2))/b^2 - integrat
e(2/3*(3*a*b^2*c*x^2*log(f) + a^3*c*log(f) + (3*a^2*b*c*log(f) - 2*b*c^2*lo
g(f)^2)*x)*f^(c/(b^2*x^2 + 2*a*b*x + a^2))/(b^5*x^3 + 3*a*b^4*x^2 + 3*a^2*b
^3*x + a^3*b^2), x)
```

Fricas [A]
time = 0.36, size = 128, normalized size = 0.62

$$\frac{3\,ac\mathrm{Ei}\left(\frac{c\log(f)}{b^2x^2+2\,abx+a^2}\right)\log\left(f\right)+\sqrt{\pi}\left(3\,a^2b+2\,bc\log\left(f\right)\right)\sqrt{-\frac{c\log\left(f\right)}{b^2}}\,\mathrm{erf}\left(\frac{b\sqrt{-\frac{c\log\left(f\right)}{b^2}}}{bx+a}\right)+\left(b^3x^3+a^3+2\left(bcx+ac\right)\log\left(f\right)\right)f^{\frac{c}{b^2x^2+2\,abx+a^2}}}{3\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x^2,x, algorithm="fricas")
```

```
[Out] 1/3*(3*a*c*Ei(c*log(f)/(b^2*x^2 + 2*a*b*x + a^2))*log(f) + sqrt(pi)*(3*a^2*
b + 2*b*c*log(f))*sqrt(-c*log(f)/b^2)*erf(b*sqrt(-c*log(f)/b^2)/(b*x + a))
+ (b^3*x^3 + a^3 + 2*(b*c*x + a*c)*log(f))*f^(c/(b^2*x^2 + 2*a*b*x + a^2)))
/b^3
```

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

$$\int f^{\frac{c}{(a+bx)^2}}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**2)*x**2,x)
```

```
[Out] Integral(f**(c/(a + b*x)**2)*x**2, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x^2,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a)^2)*x^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int f^{\frac{c}{(a+b\,x)^2}}\,x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^2)*x^2,x)
```

```
[Out] int(f^(c/(a + b*x)^2)*x^2, x)
```

3.227 $\int f^{\frac{c}{(a+bx)^2}} x \, dx$

Optimal. Leaf size=111

$$-\frac{af^{\frac{c}{(a+bx)^2}}(a+bx)}{b^2}+\frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^2}{2b^2}+\frac{a\sqrt{c}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{c}\sqrt{\log(f)}}{a+bx}\right)\sqrt{\log(f)}}{b^2}-\frac{c\mathrm{Ei}\left(\frac{c\log(f)}{(a+bx)^2}\right)\log(f)}{2b^2}$$

```
[Out] -a*f^(c/(b*x+a)^2)*(b*x+a)/b^2+1/2*f^(c/(b*x+a)^2)*(b*x+a)^2/b^2-1/2*c*Ei(c
*ln(f)/(b*x+a)^2)*ln(f)/b^2+a*erfi(c^(1/2)*ln(f)^(1/2)/(b*x+a))*c^(1/2)*Pi^
(1/2)*ln(f)^(1/2)/b^2
```

Rubi [A]
time = 0.08, antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.462$, Rules used = {2258, 2237, 2242, 2235, 2245, 2241}

$$\frac{\sqrt{\pi}a\sqrt{c}\sqrt{\log(f)}\,\mathrm{Erfi}\left(\frac{\sqrt{c}\sqrt{\log(f)}}{a+bx}\right)}{b^2}-\frac{c\log(f)\mathrm{Ei}\left(\frac{c\log(f)}{(a+bx)^2}\right)}{2b^2}+\frac{(a+bx)^2f^{\frac{c}{(a+bx)^2}}}{2b^2}-\frac{a(a+bx)f^{\frac{c}{(a+bx)^2}}}{b^2}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x)^2)*x,x]
```

```
[Out] -((a*f^(c/(a + b*x)^2)*(a + b*x))/b^2) + (f^(c/(a + b*x)^2)*(a + b*x)^2)/(2
*b^2) + (a*Sqrt[c]*Sqrt[Pi]*Erfi[(Sqrt[c]*Sqrt[Log[f]])/(a + b*x)]*Sqrt[Log
[f]])/b^2 - (c*ExpIntegralEi[(c*Log[f])/(a + b*x)^2]*Log[f])/(2*b^2)
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{\frac{c}{(a+bx)^2}} x\,dx = \int \left(-\frac{a f^{\frac{c}{(a+bx)^2}}}{b} + \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)}{b}\right) dx$$

$$= \frac{\int f^{\frac{c}{(a+bx)^2}}(a+bx)\,dx}{b} - \frac{a\int f^{\frac{c}{(a+bx)^2}}\,dx}{b}$$

$$= -\frac{a f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^2} + \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^2}{2b^2} + \frac{(c\log(f))\int \frac{f^{\frac{c}{(a+bx)^2}}}{a+bx}\,dx}{b} - \frac{(2ac\log(f))\int \frac{f^{\frac{c}{(a+bx)^2}}}{(a+bx)^2}\,d}{b}$$

$$= -\frac{a f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^2} + \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^2}{2b^2} - \frac{c\text{Ei}\left(\frac{c\log(f)}{(a+bx)^2}\right)\log(f)}{2b^2} + \frac{(2ac\log(f))\text{Subst}\left(\int f^{cx^2}\right.}{b^2}$$

$$= -\frac{a f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^2} + \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^2}{2b^2} + \frac{a\sqrt{c}\,\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{c}\,\sqrt{\log(f)}}{a+bx}\right)\sqrt{\log(f)}}{b^2} - \frac{c\text{Ei}\left(\right.}{}$$

Mathematica [A]
time = 0.04, size = 89, normalized size = 0.80

$$\frac{f^{\frac{c}{(a+bx)^2}}(-a^2+b^2x^2) + 2a\sqrt{c}\,\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{c}\,\sqrt{\log(f)}}{a+bx}\right)\sqrt{\log(f)} - c\text{Ei}\left(\frac{c\log(f)}{(a+bx)^2}\right)\log(f)}{2b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x)^2)*x,x]
```

```
[Out] (f^(c/(a + b*x)^2)*(-a^2 + b^2*x^2) + 2*a*Sqrt[c]*Sqrt[Pi]*Erfi[(Sqrt[c]*Sq
rt[Log[f]])/(a + b*x)]*Sqrt[Log[f]] - c*ExpIntegralEi[(c*Log[f])/(a + b*x)^
2]*Log[f])/(2*b^2)
```

Maple [A]
time = 0.05, size = 93, normalized size = 0.84

method	result	size
risch	$\frac{f^{\frac{c}{(bx+a)^2}} x^2}{2} - \frac{f^{\frac{c}{(bx+a)^2}} a^2}{2b^2} + \frac{\ln(f) c \operatorname{expIntegral}\left(1, -\frac{c\ln(f)}{(bx+a)^2}\right)}{2b^2} + \frac{a\ln(f) c \sqrt{\pi}\, \operatorname{erf}\left(\frac{\sqrt{-c\ln(f)}}{bx+a}\right)}{b^2 \sqrt{-c\ln(f)}}$	93

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a)^2)*x,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*f^(c/(b*x+a)^2)*x^2-1/2/b^2*f^(c/(b*x+a)^2)*a^2+1/2/b^2*ln(f)*c*Ei(1,-c
*ln(f)/(b*x+a)^2)+1/b^2*a*ln(f)*c*Pi^(1/2)/(-c*ln(f))^(1/2)*erf((-c*ln(f))^
(1/2)/(b*x+a))
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x,x, algorithm="maxima")
```

```
[Out] b*c*integrate(f^(c/(b^2*x^2 + 2*a*b*x + a^2))*x^2/(b^3*x^3 + 3*a*b^2*x^2 +
3*a^2*b*x + a^3), x)*log(f) + 1/2*f^(c/(b^2*x^2 + 2*a*b*x + a^2))*x^2
```

Fricas [A]
time = 0.40, size = 107, normalized size = 0.96

$$-\frac{2\sqrt{\pi}\, ab\sqrt{-\frac{c\log(f)}{b^2}}\, \operatorname{erf}\left(\frac{b\sqrt{-\frac{c\log(f)}{b^2}}}{bx+a}\right) + c\operatorname{Ei}\left(\frac{c\log(f)}{b^2x^2+2\,abx+a^2}\right)\log(f) - (b^2x^2-a^2)f^{\frac{c}{b^2x^2+2\,abx+a^2}}}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x,x, algorithm="fricas")
```

```
[Out] -1/2*(2*sqrt(pi)*a*b*sqrt(-c*log(f)/b^2)*erf(b*sqrt(-c*log(f)/b^2)/(b*x + a
)) + c*Ei(c*log(f)/(b^2*x^2 + 2*a*b*x + a^2))*log(f) - (b^2*x^2 - a^2)*f^(c
/(b^2*x^2 + 2*a*b*x + a^2)))/b^2
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(a+bx)^2}}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**2)*x,x)
```

```
[Out] Integral(f**(c/(a + b*x)**2)*x, x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a)^2)*x, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int f^{\frac{c}{(a+b\,x)^2}}\,x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^2)*x,x)
```

```
[Out] int(f^(c/(a + b*x)^2)*x, x)
```

3.228 $\int f^{\frac{c}{(a+bx)^2}}\,dx$

Optimal. Leaf size=62

$$\frac{f^{\frac{c}{(a+bx)^2}}(a+bx)}{b}-\frac{\sqrt{c}\,\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{c}\,\sqrt{\log(f)}}{a+bx}\right)\sqrt{\log(f)}}{b}$$

```
[Out] f^(c/(b*x+a)^2)*(b*x+a)/b-erfi(c^(1/2)*ln(f)^(1/2)/(b*x+a))*c^(1/2)*Pi^(1/2
)*ln(f)^(1/2)/b
```

Rubi [A]
time = 0.03, antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {2237, 2242, 2235}

$$\frac{(a+bx)f^{\frac{c}{(a+bx)^2}}}{b}-\frac{\sqrt{\pi}\,\sqrt{c}\,\sqrt{\log(f)}\,\text{Erfi}\left(\frac{\sqrt{c}\,\sqrt{\log(f)}}{a+bx}\right)}{b}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x)^2),x]
```

```
[Out] (f^(c/(a + b*x)^2)*(a + b*x))/b - (Sqrt[c]*Sqrt[Pi]*Erfi[(Sqrt[c]*Sqrt[Log[
f]])/(a + b*x)]*Sqrt[Log[f]])/b
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rubi steps

$$\begin{aligned}\int f^{\frac{c}{(a+bx)^2}}\,dx &= \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)}{b} + (2c\log(f))\int \frac{f^{\frac{c}{(a+bx)^2}}}{(a+bx)^2}\,dx \\ &= \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)}{b} - \frac{(2c\log(f))\text{Subst}\left(\int f^{cx^2}\,dx, x, \frac{1}{a+bx}\right)}{b} \\ &= \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)}{b} - \frac{\sqrt{c}\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{c}\sqrt{\log(f)}}{a+bx}\right)\sqrt{\log(f)}}{b}\end{aligned}$$

Mathematica [A]
time = 0.02, size = 62, normalized size = 1.00

$$\frac{f^{\frac{c}{(a+bx)^2}}(a+bx)}{b} - \frac{\sqrt{c}\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{c}\sqrt{\log(f)}}{a+bx}\right)\sqrt{\log(f)}}{b}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x)^2),x]
```

```
[Out] (f^(c/(a + b*x)^2)*(a + b*x))/b - (Sqrt[c]*Sqrt[Pi]*Erfi[(Sqrt[c]*Sqrt[Log[
f]])/(a + b*x)]*Sqrt[Log[f]])/b
```

Maple [A]
time = 0.02, size = 65, normalized size = 1.05

method	result	size
risch	$f^{\frac{c}{(bx+a)^2}}x + \frac{f^{\frac{c}{(bx+a)^2}}a}{b} - \frac{\ln(f)c\sqrt{\pi}\,\text{erf}\left(\frac{\sqrt{-c\ln(f)}}{bx+a}\right)}{b\sqrt{-c\ln(f)}}$	65

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a)^2),x,method=_RETURNVERBOSE)
```

```
[Out] f^(c/(b*x+a)^2)*x+1/b*f^(c/(b*x+a)^2)*a-1/b*ln(f)*c*Pi^(1/2)/(-c*ln(f))^(1/
2)*erf((-c*ln(f))^(1/2)/(b*x+a))
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2),x, algorithm="maxima")
```

```
[Out] 2*b*c*integrate(f^(c/(b^2*x^2 + 2*a*b*x + a^2))*x/(b^3*x^3 + 3*a*b^2*x^2 +
3*a^2*b*x + a^3), x)*log(f) + f^(c/(b^2*x^2 + 2*a*b*x + a^2))*x
```

Fricas [A]
time = 0.42, size = 68, normalized size = 1.10

$$\frac{\sqrt{\pi}\, b\sqrt{-\frac{c\log\left(f\right)}{b^2}}\ \mathrm{erf}\left(\frac{b\sqrt{-\frac{c\log\left(f\right)}{b^2}}}{bx+a}\right)+(bx+a)f^{\frac{c}{b^2x^2+2\,abx+a^2}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2),x, algorithm="fricas")
```

```
[Out] (sqrt(pi)*b*sqrt(-c*log(f)/b^2)*erf(b*sqrt(-c*log(f)/b^2)/(b*x + a)) + (b*x
 + a)*f^(c/(b^2*x^2 + 2*a*b*x + a^2)))/b
```

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

$$\int f^{\frac{c}{(a+bx)^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**2),x)
```

```
[Out] Integral(f**(c/(a + b*x)**2), x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2),x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a)^2), x)
```

Mupad [B]
time = 3.64, size = 53, normalized size = 0.85

$$\frac{f^{\frac{c}{(a+b\,x)^2}}\,(a+b\,x)}{b}-\frac{c\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{c\,\ln\left(f\right)}}{a+b\,x}\right)\,\ln\left(f\right)}{b\,\sqrt{c\,\ln\left(f\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(f^(c/(a + b*x)^2),x)

[Out] (f^(c/(a + b*x)^2)*(a + b*x))/b - (c*pi^(1/2)*erfi((c*log(f))^(1/2)/(a + b*
x))*log(f))/(b*(c*log(f))^(1/2))

3.229 $\int \frac{f^{\frac{c}{(a+bx)^2}}}{x}\,dx$

Optimal. Leaf size=18

$$\text{Int}\left(\frac{f^{\frac{c}{(a+bx)^2}}}{x},x\right)$$

```
[Out] Unintegrable(f^(c/(b*x+a)^2)/x,x)
```

Rubi [A]
time = 0.01, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f^{\frac{c}{(a+bx)^2}}}{x}\,dx$$

Verification is not applicable to the result.

```
[In] Int[f^(c/(a + b*x)^2)/x,x]
```

```
[Out] Defer[Int][f^(c/(a + b*x)^2)/x, x]
```

Rubi steps

$$\int \frac{f^{\frac{c}{(a+bx)^2}}}{x}\,dx=\int \frac{f^{\frac{c}{(a+bx)^2}}}{x}\,dx$$

Mathematica [A]
time = 0.05, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(a+bx)^2}}}{x}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[f^(c/(a + b*x)^2)/x,x]
```

```
[Out] Integrate[f^(c/(a + b*x)^2)/x, x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(bx+a)^2}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a)^2)/x,x)
```

```
[Out] int(f^(c/(b*x+a)^2)/x,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)/x,x, algorithm="maxima")
```

```
[Out] integrate(f^(c/(b*x + a)^2)/x, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)/x,x, algorithm="fricas")
```

```
[Out] integral(f^(c/(b^2*x^2 + 2*a*b*x + a^2))/x, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(a+bx)^2}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**2)/x,x)
```

```
[Out] Integral(f**(c/(a + b*x)**2)/x, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)/x,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a)^2)/x, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{f^{\frac{c}{(a+b\,x)^2}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^2)/x,x)
[Out] int(f^(c/(a + b*x)^2)/x, x)
```

3.230 $\int \frac{f^{\frac{c}{(a+bx)^2}}}{x^2} \, dx$

Optimal. Leaf size=18

$$\text{Int}\left(\frac{f^{\frac{c}{(a+bx)^2}}}{x^2}, x\right)$$

[Out] CannotIntegrate(f^(c/(b*x+a)^2)/x^2,x)

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{f^{\frac{c}{(a+bx)^2}}}{x^2} \, dx$$

Verification is not applicable to the result.

[In] Int[f^(c/(a + b*x)^2)/x^2,x]

[Out] Defer[Int][f^(c/(a + b*x)^2)/x^2, x]

Rubi steps

$$\int \frac{f^{\frac{c}{(a+bx)^2}}}{x^2} \, dx = \int \frac{f^{\frac{c}{(a+bx)^2}}}{x^2} \, dx$$

Mathematica [A]
time = 0.18, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(a+bx)^2}}}{x^2} \, dx$$

Verification is not applicable to the result.

[In] Integrate[f^(c/(a + b*x)^2)/x^2,x]

[Out] Integrate[f^(c/(a + b*x)^2)/x^2, x]

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(bx+a)^2}}}{x^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a)^2)/x^2,x)
```

```
[Out] int(f^(c/(b*x+a)^2)/x^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)/x^2,x, algorithm="maxima")
```

```
[Out] integrate(f^(c/(b*x + a)^2)/x^2, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)/x^2,x, algorithm="fricas")
```

```
[Out] integral(f^(c/(b^2*x^2 + 2*a*b*x + a^2))/x^2, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(a+bx)^2}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**2)/x**2,x)
```

```
[Out] Integral(f**(c/(a + b*x)**2)/x**2, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)/x^2,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a)^2)/x^2, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{f^{\frac{c}{(a+b\,x)^2}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^2)/x^2,x)
[Out] int(f^(c/(a + b*x)^2)/x^2, x)
```

3.231 $\int \frac{f^{\frac{c}{(a+bx)^2}}}{x^3}\,dx$

Optimal. Leaf size=18

$$\text{Int}\left(\frac{f^{\frac{c}{(a+bx)^2}}}{x^3},x\right)$$

```
[Out] CannotIntegrate(f^(c/(b*x+a)^2)/x^3,x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{f^{\frac{c}{(a+bx)^2}}}{x^3}\,dx$$

Verification is not applicable to the result.

```
[In] Int[f^(c/(a + b*x)^2)/x^3,x]
[Out] Defer[Int][f^(c/(a + b*x)^2)/x^3, x]
```

Rubi steps

$$\int \frac{f^{\frac{c}{(a+bx)^2}}}{x^3}\,dx = \int \frac{f^{\frac{c}{(a+bx)^2}}}{x^3}\,dx$$

Mathematica [A]
time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(a+bx)^2}}}{x^3}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[f^(c/(a + b*x)^2)/x^3,x]
[Out] Integrate[f^(c/(a + b*x)^2)/x^3, x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(bx+a)^2}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a)^2)/x^3,x)
```

```
[Out] int(f^(c/(b*x+a)^2)/x^3,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^(c/(b*x + a)^2)/x^3, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral(f^(c/(b^2*x^2 + 2*a*b*x + a^2))/x^3, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(a+bx)^2}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**2)/x**3,x)
```

```
[Out] Integral(f**(c/(a + b*x)**2)/x**3, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^(c/(b*x + a)^2)/x^3, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{f^{\frac{c}{(a+b\,x)^2}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^2)/x^3,x)
```

```
[Out] int(f^(c/(a + b*x)^2)/x^3, x)
```

3.232 $\int f^{\frac{c}{(a+bx)^3}} x^4 \, dx$

Optimal. Leaf size=239

$$\frac{2a^2 f^{\frac{c}{(a+bx)^3}} (a+bx)^3}{b^5} - \frac{2a^2 c \operatorname{Ei}\left(\frac{c\log(f)}{(a+bx)^3}\right)\log(f)}{b^5} + \frac{a^4(a+bx)\Gamma\left(-\frac{1}{3}, -\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}}{3b^5} - \frac{4a^3(a+bx)^2\Gamma\left(\right.}{}$$

```
[Out] 2*a^2*f^(c/(b*x+a)^3)*(b*x+a)^3/b^5-2*a^2*c*Ei(c*ln(f)/(b*x+a)^3)*ln(f)/b^5
+1/3*a^4*(b*x+a)*GAMMA(-1/3,-c*ln(f)/(b*x+a)^3)*(-c*ln(f)/(b*x+a)^3)^(1/3)/
b^5-4/3*a^3*(b*x+a)^2*GAMMA(-2/3,-c*ln(f)/(b*x+a)^3)*(-c*ln(f)/(b*x+a)^3)^(
2/3)/b^5-4/3*a*(b*x+a)^4*GAMMA(-4/3,-c*ln(f)/(b*x+a)^3)*(-c*ln(f)/(b*x+a)^3
)^(4/3)/b^5+1/3*(b*x+a)^5*GAMMA(-5/3,-c*ln(f)/(b*x+a)^3)*(-c*ln(f)/(b*x+a)^
3)^(5/3)/b^5
```

Rubi [A]
time = 0.14, antiderivative size = 239, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {2258, 2239, 2250, 2245, 2241}

$$\frac{a^4(a+bx)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}\text{Gamma}\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b^5} - \frac{4a^3(a+bx)^2\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{2/3}\text{Gamma}\left(-\frac{2}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b^5} + \frac{(a+bx)^5\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{5/3}\text{Gamma}\left(-\frac{5}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b^5} - \frac{4a(a+bx)^4\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{4/3}\text{Gamma}\left(-\frac{4}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b^5} - \frac{2a^2c\log(f)\text{Ei}\left(\frac{c\log(f)}{(a+bx)^3}\right)}{b^5} + \frac{2a^2(a+bx)^3 f^{\frac{c}{(a+bx)^3}}}{b^5}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x)^3)*x^4,x]
```

```
[Out] (2*a^2*f^(c/(a + b*x)^3)*(a + b*x)^3)/b^5 - (2*a^2*c*ExpIntegralEi[(c*Log[f
])/(a + b*x)^3]*Log[f])/b^5 + (a^4*(a + b*x)*Gamma[-1/3, -((c*Log[f])/(a +
b*x)^3)]*(-((c*Log[f])/(a + b*x)^3))^(1/3))/(3*b^5) - (4*a^3*(a + b*x)^2*Ga
mma[-2/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f])/(a + b*x)^3))^(2/3))/(3*
b^5) - (4*a*(a + b*x)^4*Gamma[-4/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f]
)/(a + b*x)^3))^(4/3))/(3*b^5) + ((a + b*x)^5*Gamma[-5/3, -((c*Log[f])/(a +
 b*x)^3)]*(-((c*Log[f])/(a + b*x)^3))^(5/3))/(3*b^5)
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{\frac{c}{(a+bx)^3}} x^4\,dx = \int \left(\frac{a^4 f^{\frac{c}{(a+bx)^3}}}{b^4} - \frac{4a^3 f^{\frac{c}{(a+bx)^3}}(a+bx)}{b^4} + \frac{6a^2 f^{\frac{c}{(a+bx)^3}}(a+bx)^2}{b^4} - \frac{4a f^{\frac{c}{(a+bx)^3}}(a+bx)^3}{b^4} + \cdots\right.$$

$$= \frac{\int f^{\frac{c}{(a+bx)^3}}(a+bx)^4\,dx}{b^4} - \frac{(4a)\int f^{\frac{c}{(a+bx)^3}}(a+bx)^3\,dx}{b^4} + \frac{(6a^2)\int f^{\frac{c}{(a+bx)^3}}(a+bx)^2\,dx}{b^4} - \cdots$$

$$= \frac{2a^2 f^{\frac{c}{(a+bx)^3}}(a+bx)^3}{b^5} + \frac{a^4(a+bx)\Gamma\left(-\frac{1}{3}, -\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}}{3b^5} - \frac{4a^3(a+bx)^2\Gamma\left(-\frac{2}{3}, \cdots\right.}{\cdots}$$

$$= \frac{2a^2 f^{\frac{c}{(a+bx)^3}}(a+bx)^3}{b^5} - \frac{2a^2 c\,\text{Ei}\left(\frac{c\log(f)}{(a+bx)^3}\right)\log(f)}{b^5} + \frac{a^4(a+bx)\Gamma\left(-\frac{1}{3}, -\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+b\cdots}}}{3b^5}$$

Mathematica [A]
time = 0.13, size = 219, normalized size = 0.92

$$\frac{6a^2 f^{\frac{c}{(a+bx)^3}}(a+bx)^3 - 6a^2 c\,\text{Ei}\left(\frac{c\log(f)}{(a+bx)^3}\right)\log(f) + a^4(a+bx)\Gamma\left(-\frac{1}{3}, -\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}} + 4ac(a+bx)\Gamma\left(-\frac{4}{3}, -\frac{c\log(f)}{(a+bx)^3}\right)\log(f)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}} - 4a^3(a+bx)^2\Gamma\left(-\frac{2}{3}, -\frac{c\log(f)}{(a+bx)^3}\right)\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{2/3} + (a+bx)^5\Gamma\left(-\frac{5}{3}, -\frac{c\log(f)}{(a+bx)^3}\right)\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{5/3}}{3b^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x)^3)*x^4,x]
```

```
[Out] (6*a^2*f^(c/(a + b*x)^3)*(a + b*x)^3 - 6*a^2*c*ExpIntegralEi[(c*Log[f])/(a
+ b*x)^3]*Log[f] + a^4*(a + b*x)*Gamma[-1/3, -((c*Log[f])/(a + b*x)^3)]*(-(
(c*Log[f])/(a + b*x)^3))^(1/3) + 4*a*c*(a + b*x)*Gamma[-4/3, -((c*Log[f])/(
a + b*x)^3)]*Log[f]*(-((c*Log[f])/(a + b*x)^3))^(1/3) - 4*a^3*(a + b*x)^2*G
amma[-2/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f])/(a + b*x)^3))^(2/3) + (
a + b*x)^5*Gamma[-5/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f])/(a + b*x)^3
))^(5/3))/(3*b^5)
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(bx+a)^3}} x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a)^3)*x^4,x)
```

```
[Out] int(f^(c/(b*x+a)^3)*x^4,x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x^4,x, algorithm="maxima")
```

```
[Out] 1/10*(2*b^4*x^5 + 3*b*c*x^2*log(f) - 24*a*c*x*log(f))*f^(c/(b^3*x^3 + 3*a*b
^2*x^2 + 3*a^2*b*x + a^3))/b^4 + integrate(3/10*(20*a^2*b^3*c*x^3*log(f) +
8*a^5*c*log(f) + (40*a^3*b^2*c*log(f) + 3*b^2*c^2*log(f)^2)*x^2 + 6*(5*a^4*
b*c*log(f) - 4*a*b*c^2*log(f)^2)*x)*f^(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x
 + a^3))/(b^8*x^4 + 4*a*b^7*x^3 + 6*a^2*b^6*x^2 + 4*a^3*b^5*x + a^4*b^4), x
)
```

Fricas [A]
time = 0.09, size = 248, normalized size = 1.04

$$-\frac{20\,a^2c\mathrm{Ei}\left(\frac{c\log(f)}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}\right)\log\left(f\right)-\left(20\,a^3b^2-3\,b^2c\log\left(f\right)\right)\left(-\frac{c\log(f)}{b^3}\right)^{\frac{2}{3}}\Gamma\left(\frac{1}{3},-\frac{c\log(f)}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}\right)+10\left(a^4b-3\,abc\log\left(f\right)\right)\left(-\frac{c\log(f)}{b^3}\right)^{\frac{1}{3}}\Gamma\left(\frac{2}{3},-\frac{c\log(f)}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}\right)-\left(2\,b^5x^5+2\,a^5+3\left(b^2cx^2-8\,abcx-9\,a^2c\right)\log\left(f\right)\right)f^{\frac{c}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}}}{10\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x^4,x, algorithm="fricas")
```

```
[Out] -1/10*(20*a^2*c*Ei(c*log(f)/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))*log(
f) - (20*a^3*b^2 - 3*b^2*c*log(f))*(-c*log(f)/b^3)^(2/3)*gamma(1/3, -c*log(
f)/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)) + 10*(a^4*b - 3*a*b*c*log(f))
```

```
*(-c*log(f)/b^3)^(1/3)*gamma(2/3, -c*log(f)/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*
b*x + a^3)) - (2*b^5*x^5 + 2*a^5 + 3*(b^2*c*x^2 - 8*a*b*c*x - 9*a^2*c)*log(
f))*f^(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)))/b^5
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(a+bx)^3}}x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**3)*x***4,x)
[Out] Integral(f**(c/(a + b*x)**3)*x***4, x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x^4,x, algorithm="giac")
[Out] integrate(f^(c/(b*x + a)^3)*x^4, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int f^{\frac{c}{(a+b\,x)^3}}\,x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^3)*x^4,x)
[Out] int(f^(c/(a + b*x)^3)*x^4, x)
```

3.233 $\int f^{\frac{c}{(a+bx)^3}} x^3\,dx$

Optimal. Leaf size=184

$$-\frac{af^{\frac{c}{(a+bx)^3}}(a+bx)^3}{b^4}+\frac{ac\text{Ei}\left(\frac{c\log(f)}{(a+bx)^3}\right)\log(f)}{b^4}-\frac{a^3(a+bx)\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}}{3b^4}+\frac{a^2(a+bx)^2\Gamma\left(-\frac{2}{3},\right.}{}$$

```
[Out] -a*f^(c/(b*x+a)^3)*(b*x+a)^3/b^4+a*c*Ei(c*ln(f)/(b*x+a)^3)*ln(f)/b^4-1/3*a^
3*(b*x+a)*GAMMA(-1/3,-c*ln(f)/(b*x+a)^3)*(-c*ln(f)/(b*x+a)^3)^(1/3)/b^4+a^2
*(b*x+a)^2*GAMMA(-2/3,-c*ln(f)/(b*x+a)^3)*(-c*ln(f)/(b*x+a)^3)^(2/3)/b^4+1/
3*(b*x+a)^4*GAMMA(-4/3,-c*ln(f)/(b*x+a)^3)*(-c*ln(f)/(b*x+a)^3)^(4/3)/b^4
```

Rubi [A]

time = 0.11, antiderivative size = 184, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {2258, 2239, 2250, 2245, 2241}

$$-\frac{a^3(a+bx)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}\text{Gamma}\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b^4}+\frac{a^2(a+bx)^2\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{2/3}\text{Gamma}\left(-\frac{2}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{b^4}+\frac{(a+bx)^4\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{4/3}\text{Gamma}\left(-\frac{4}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b^4}+\frac{ac\log(f)\text{Ei}\left(\frac{c\log(f)}{(a+bx)^3}\right)}{b^4}-\frac{a(a+bx)^3f^{\frac{c}{(a+bx)^3}}}{b^4}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x)^3)*x^3,x]
```

```
[Out] -((a*f^(c/(a + b*x)^3)*(a + b*x)^3)/b^4) + (a*c*ExpIntegralEi[(c*Log[f])/(a
 + b*x)^3]*Log[f])/b^4 - (a^3*(a + b*x)*Gamma[-1/3, -((c*Log[f])/(a + b*x)^
3)]*(-((c*Log[f])/(a + b*x)^3))^(1/3))/(3*b^4) + (a^2*(a + b*x)^2*Gamma[-2/
3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f])/(a + b*x)^3))^(2/3))/b^4 + ((a
+ b*x)^4*Gamma[-4/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f])/(a + b*x)^3))
^(4/3))/(3*b^4)
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
```

```
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{\frac{c}{(a+bx)^3}} x^3\,dx = \int \left(-\frac{a^3 f^{\frac{c}{(a+bx)^3}}}{b^3} + \frac{3a^2 f^{\frac{c}{(a+bx)^3}}(a+bx)}{b^3} - \frac{3af^{\frac{c}{(a+bx)^3}}(a+bx)^2}{b^3} + \frac{f^{\frac{c}{(a+bx)^3}}(a+bx)^3}{b^3}\right) dx$$

$$= \frac{\int f^{\frac{c}{(a+bx)^3}}(a+bx)^3\,dx}{b^3} - \frac{(3a)\int f^{\frac{c}{(a+bx)^3}}(a+bx)^2\,dx}{b^3} + \frac{(3a^2)\int f^{\frac{c}{(a+bx)^3}}(a+bx)\,dx}{b^3} - \frac{a^3 \int$$

$$= -\frac{af^{\frac{c}{(a+bx)^3}}(a+bx)^3}{b^4} - \frac{a^3(a+bx)\Gamma\left(-\frac{1}{3}, -\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}}{3b^4} + \frac{a^2(a+bx)^2\Gamma\left(-\frac{2}{3},\right.}{}$$

$$= -\frac{af^{\frac{c}{(a+bx)^3}}(a+bx)^3}{b^4} + \frac{ac\,\text{Ei}\left(\frac{c\log(f)}{(a+bx)^3}\right)\log(f)}{b^4} - \frac{a^3(a+bx)\Gamma\left(-\frac{1}{3}, -\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)}}}{3b^4}$$

Mathematica [A]
time = 0.25, size = 167, normalized size = 0.91

$$\frac{3ac\,\text{Ei}\left(\frac{c\log(f)}{(a+bx)^3}\right)\log(f) - (a+bx)\left(a^3\Gamma\left(-\frac{1}{3}, -\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}} + c\Gamma\left(-\frac{4}{3}, -\frac{c\log(f)}{(a+bx)^3}\right)\log(f)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}} + 3a(a+bx)\left(f^{\frac{c}{(a+bx)^3}}(a+bx) - a\Gamma\left(-\frac{2}{3}, -\frac{c\log(f)}{(a+bx)^3}\right)\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{2/3}\right)\right)}{3b^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x)^3)*x^3,x]
```

```
[Out] (3*a*c*ExpIntegralEi[(c*Log[f])/(a + b*x)^3]*Log[f] - (a + b*x)*(a^3*Gamma[
-1/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f])/(a + b*x)^3))^(1/3) + c*Gamm
a[-4/3, -((c*Log[f])/(a + b*x)^3)]*Log[f]*(-((c*Log[f])/(a + b*x)^3))^(1/3)
 + 3*a*(a + b*x)*(f^(c/(a + b*x)^3)*(a + b*x) - a*Gamma[-2/3, -((c*Log[f])/
(a + b*x)^3)]*(-((c*Log[f])/(a + b*x)^3))^(2/3))))/(3*b^4)
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(bx+a)^3}} x^3\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a)^3)*x^3,x)
```

```
[Out] int(f^(c/(b*x+a)^3)*x^3,x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x^3,x, algorithm="maxima")
```

```
[Out] 1/4*(b^3*x^4 + 3*c*x*log(f))*f^(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)
)/b^3 - integrate(3/4*(4*a*b^3*c*x^3*log(f) + 6*a^2*b^2*c*x^2*log(f) + a^4*
c*log(f) + (4*a^3*b*c*log(f) - 3*b*c^2*log(f)^2)*x)*f^(c/(b^3*x^3 + 3*a*b^2
*x^2 + 3*a^2*b*x + a^3))/(b^7*x^4 + 4*a*b^6*x^3 + 6*a^2*b^5*x^2 + 4*a^3*b^4
*x + a^4*b^3), x)
```

Fricas [A]
time = 0.11, size = 221, normalized size = 1.20

$$-\frac{6\,a^2b^2\left(-\frac{c\log(f)}{b^3}\right)^{\frac{2}{3}}\Gamma\left(\frac{1}{3},-\frac{c\log(f)}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}\right)-4\,ac\mathrm{Ei}\left(\frac{c\log(f)}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}\right)\log\left(f\right)-\left(4\,a^3b-3\,bc\log\left(f\right)\right)\left(-\frac{c\log(f)}{b^3}\right)^{\frac{1}{3}}\Gamma\left(\frac{2}{3},-\frac{c\log(f)}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}\right)-\left(b^4x^4-a^4+3\,\left(bcx+ac\right)\log\left(f\right)\right)f^{\frac{c}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}}}{4\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x^3,x, algorithm="fricas")
```

```
[Out] -1/4*(6*a^2*b^2*(-c*log(f)/b^3)^(2/3)*gamma(1/3, -c*log(f)/(b^3*x^3 + 3*a*b
^2*x^2 + 3*a^2*b*x + a^3)) - 4*a*c*Ei(c*log(f)/(b^3*x^3 + 3*a*b^2*x^2 + 3*a
^2*b*x + a^3))*log(f) - (4*a^3*b - 3*b*c*log(f))*(-c*log(f)/b^3)^(1/3)*gamm
a(2/3, -c*log(f)/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)) - (b^4*x^4 - a^
4 + 3*(b*c*x + a*c)*log(f))*f^(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))
)/b^4
```

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

$$\int f^{\frac{c}{(a+bx)^3}}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**3)*x**3,x)
```

```
[Out] Integral(f**(c/(a + b*x)**3)*x**3, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x^3,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a)^3)*x^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int f^{\frac{c}{{\left(a+b\,x\right)}^3}}\,x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^3)*x^3,x)
```

```
[Out] int(f^(c/(a + b*x)^3)*x^3, x)
```

3.234 $\int f^{\frac{c}{(a+bx)^3}} x^2 \, dx$

Optimal. Leaf size=142

$$\frac{f^{\frac{c}{(a+bx)^3}}(a+bx)^3}{3b^3}-\frac{c\text{Ei}\left(\frac{c\log(f)}{(a+bx)^3}\right)\log(f)}{3b^3}+\frac{a^2(a+bx)\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}}{3b^3}-\frac{2a(a+bx)^2\Gamma\left(-\frac{2}{3},-\frac{c}{(a}\right.}{3b^3}$$

```
[Out] 1/3*f^(c/(b*x+a)^3)*(b*x+a)^3/b^3-1/3*c*Ei(c*ln(f)/(b*x+a)^3)*ln(f)/b^3+1/3
*a^2*(b*x+a)*GAMMA(-1/3,-c*ln(f)/(b*x+a)^3)*(-c*ln(f)/(b*x+a)^3)^(1/3)/b^3-
2/3*a*(b*x+a)^2*GAMMA(-2/3,-c*ln(f)/(b*x+a)^3)*(-c*ln(f)/(b*x+a)^3)^(2/3)/b
^3
```

Rubi [A]
time = 0.08, antiderivative size = 142, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {2258, 2239, 2250, 2245, 2241}

$$\frac{a^2(a+bx)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}\text{Gamma}\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b^3}-\frac{2a(a+bx)^2\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{2/3}\text{Gamma}\left(-\frac{2}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b^3}-\frac{c\log(f)\text{Ei}\left(\frac{c\log(f)}{(a+bx)^3}\right)}{3b^3}+\frac{(a+bx)^3f^{\frac{c}{(a+bx)^3}}}{3b^3}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x)^3)*x^2,x]
```

```
[Out] (f^(c/(a + b*x)^3)*(a + b*x)^3)/(3*b^3) - (c*ExpIntegralEi[(c*Log[f])/(a +
b*x)^3]*Log[f])/(3*b^3) + (a^2*(a + b*x)*Gamma[-1/3, -((c*Log[f])/(a + b*x)
^3)]*(-((c*Log[f])/(a + b*x)^3))^(1/3))/(3*b^3) - (2*a*(a + b*x)^2*Gamma[-2
/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f])/(a + b*x)^3))^(2/3))/(3*b^3)
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] && !IntegerQ[2/n]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
```

```
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\begin{aligned}\int f^{\frac{c}{(a+bx)^3}}x^2\,dx &= \int \left(\frac{a^2 f^{\frac{c}{(a+bx)^3}}}{b^2} - \frac{2af^{\frac{c}{(a+bx)^3}}(a+bx)}{b^2} + \frac{f^{\frac{c}{(a+bx)^3}}(a+bx)^2}{b^2}\right)dx\\ &= \frac{\int f^{\frac{c}{(a+bx)^3}}(a+bx)^2\,dx}{b^2} - \frac{(2a)\int f^{\frac{c}{(a+bx)^3}}(a+bx)\,dx}{b^2} + \frac{a^2\int f^{\frac{c}{(a+bx)^3}}\,dx}{b^2}\\ &= \frac{f^{\frac{c}{(a+bx)^3}}(a+bx)^3}{3b^3} + \frac{a^2(a+bx)\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}}{3b^3} - \frac{2a(a+bx)^2\Gamma\left(-\frac{2}{3},-\frac{c}{(}\right.}{3b}\\ &= \frac{f^{\frac{c}{(a+bx)^3}}(a+bx)^3}{3b^3} - \frac{c\mathrm{Ei}\left(\frac{c\log(f)}{(a+bx)^3}\right)\log(f)}{3b^3} + \frac{a^2(a+bx)\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}}{3b^3} -\end{aligned}$$

Mathematica [A]
time = 0.05, size = 127, normalized size = 0.89

$$\frac{f^{\frac{c}{(a+bx)^3}}(a+bx)^3 - c\mathrm{Ei}\left(\frac{c\log(f)}{(a+bx)^3}\right)\log(f) + a^2(a+bx)\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}} - 2a(a+bx)^2\Gamma\left(-\frac{2}{3},-\frac{c\log(f)}{(a+bx)^3}\right)\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{2/3}}{3b^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x)^3)*x^2,x]
```

```
[Out] (f^(c/(a + b*x)^3)*(a + b*x)^3 - c*ExpIntegralEi[(c*Log[f])/(a + b*x)^3]*Lo
g[f] + a^2*(a + b*x)*Gamma[-1/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f])/(
```

```
a + b*x)^3))^(1/3) - 2*a*(a + b*x)^2*Gamma[-2/3, -((c*Log[f])/(a + b*x)^3)]
*(-((c*Log[f])/(a + b*x)^3))^(2/3))/(3*b^3)
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(bx+a)^3}} x^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a)^3)*x^2,x)
```

```
[Out] int(f^(c/(b*x+a)^3)*x^2,x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*f^(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))*x^3 + b*c*integrate(f^(
c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))*x^3/(b^4*x^4 + 4*a*b^3*x^3 + 6
*a^2*b^2*x^2 + 4*a^3*b*x + a^4), x)*log(f)
```

Fricas [A]
time = 0.11, size = 194, normalized size = 1.37

$$\frac{3\,ab^2\left(-\frac{c\log(f)}{b^3}\right)^{\frac{2}{3}}\Gamma\left(\frac{1}{3},-\frac{c\log(f)}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}\right)-3\,a^2b\left(-\frac{c\log(f)}{b^3}\right)^{\frac{1}{3}}\Gamma\left(\frac{2}{3},-\frac{c\log(f)}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}\right)-c\mathrm{Ei}\left(\frac{c\log(f)}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}\right)\log(f)+(b^3x^3+a^3)f^{\frac{c}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}}}{3\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*(3*a*b^2*(-c*log(f)/b^3)^(2/3)*gamma(1/3, -c*log(f)/(b^3*x^3 + 3*a*b^2*
x^2 + 3*a^2*b*x + a^3)) - 3*a^2*b*(-c*log(f)/b^3)^(1/3)*gamma(2/3, -c*log(f
)/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)) - c*Ei(c*log(f)/(b^3*x^3 + 3*a
*b^2*x^2 + 3*a^2*b*x + a^3))*log(f) + (b^3*x^3 + a^3)*f^(c/(b^3*x^3 + 3*a*b
^2*x^2 + 3*a^2*b*x + a^3)))/b^3
```

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

$$\int f^{\frac{c}{(a+bx)^3}} x^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**3)*x**2,x)
[Out] Integral(f**(c/(a + b*x)**3)*x**2, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x^2,x, algorithm="giac")
[Out] integrate(f^(c/(b*x + a)^3)*x^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int f^{\frac{c}{(a+b\,x)^3}}\,x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^3)*x^2,x)
[Out] int(f^(c/(a + b*x)^3)*x^2, x)
```

3.235 $\int f^{\frac{c}{(a+bx)^3}} x \, dx$

Optimal. Leaf size=92

$$-\frac{a(a+bx)\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}}{3b^2}+\frac{(a+bx)^2\Gamma\left(-\frac{2}{3},-\frac{c\log(f)}{(a+bx)^3}\right)\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{2/3}}{3b^2}$$

```
[Out] -1/3*a*(b*x+a)*GAMMA(-1/3,-c*ln(f)/(b*x+a)^3)*(-c*ln(f)/(b*x+a)^3)^(1/3)/b^
2+1/3*(b*x+a)^2*GAMMA(-2/3,-c*ln(f)/(b*x+a)^3)*(-c*ln(f)/(b*x+a)^3)^(2/3)/b
^2
```

Rubi [A]
time = 0.04, antiderivative size = 92, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$, Rules used = {2258, 2239, 2250}

$$\frac{(a+bx)^2\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{2/3}\text{Gamma}\left(-\frac{2}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b^2}-\frac{a(a+bx)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}\text{Gamma}\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b^2}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x)^3)*x,x]
```

```
[Out] -1/3*(a*(a + b*x)*Gamma[-1/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f])/(a +
 b*x)^3))^(1/3))/b^2 + ((a + b*x)^2*Gamma[-2/3, -((c*Log[f])/(a + b*x)^3)]*
(-((c*Log[f])/(a + b*x)^3))^(2/3))/(3*b^2)
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
```

```
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\begin{aligned}\int f^{\frac{c}{(a+bx)^3}}x\,dx&=\int\left(-\frac{af^{\frac{c}{(a+bx)^3}}}{b}+\frac{f^{\frac{c}{(a+bx)^3}}(a+bx)}{b}\right)dx\\&=\frac{\int f^{\frac{c}{(a+bx)^3}}(a+bx)\,dx}{b}-\frac{a\int f^{\frac{c}{(a+bx)^3}}\,dx}{b}\\&=-\frac{a(a+bx)\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}}{3b^2}+\frac{(a+bx)^2\Gamma\left(-\frac{2}{3},-\frac{c\log(f)}{(a+bx)^3}\right)\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{2/3}}{3b^2}\end{aligned}$$

Mathematica [A]
time = 0.05, size = 86, normalized size = 0.93

$$\frac{(a+bx)\left(-a\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}+(a+bx)\Gamma\left(-\frac{2}{3},-\frac{c\log(f)}{(a+bx)^3}\right)\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{2/3}\right)}{3b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x)^3)*x,x]
[Out] ((a + b*x)*(-(a*Gamma[-1/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f])/(a + b
*x)^3))^(1/3)) + (a + b*x)*Gamma[-2/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log
[f])/(a + b*x)^3))^(2/3)))/(3*b^2)
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(bx+a)^3}}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a)^3)*x,x)
[Out] int(f^(c/(b*x+a)^3)*x,x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x,x, algorithm="maxima")
```

```
[Out] 3*b*c*integrate(1/2*f^(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))*x^2/(b^
4*x^4 + 4*a*b^3*x^3 + 6*a^2*b^2*x^2 + 4*a^3*b*x + a^4), x)*log(f) + 1/2*f^(
c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))*x^2
```

Fricas [A]
time = 0.10, size = 154, normalized size = 1.67

$$-\frac{b^{2}\left(-\frac{c\log(f)}{b^{3}}\right)^{\frac{2}{3}}\Gamma\left(\frac{1}{3},-\frac{c\log(f)}{b^{3}x^{3}+3\,ab^{2}x^{2}+3\,a^{2}bx+a^{3}}\right)-2\,ab\left(-\frac{c\log(f)}{b^{3}}\right)^{\frac{1}{3}}\Gamma\left(\frac{2}{3},-\frac{c\log(f)}{b^{3}x^{3}+3\,ab^{2}x^{2}+3\,a^{2}bx+a^{3}}\right)-\left(b^{2}x^{2}-a^{2}\right)f^{\frac{c}{b^{3}x^{3}+3\,ab^{2}x^{2}+3\,a^{2}bx+a^{3}}}}{2\,b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x,x, algorithm="fricas")
```

```
[Out] -1/2*(b^2*(-c*log(f)/b^3)^(2/3)*gamma(1/3, -c*log(f)/(b^3*x^3 + 3*a*b^2*x^2
 + 3*a^2*b*x + a^3)) - 2*a*b*(-c*log(f)/b^3)^(1/3)*gamma(2/3, -c*log(f)/(b^
3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)) - (b^2*x^2 - a^2)*f^(c/(b^3*x^3 + 3
*a*b^2*x^2 + 3*a^2*b*x + a^3)))/b^2
```

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

$$\int f^{\frac{c}{(a+bx)^{3}}}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**3)*x,x)
```

```
[Out] Integral(f**(c/(a + b*x)**3)*x, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a)^3)*x, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int f^{\frac{c}{(a+b\,x)^{3}}}\,x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^3)*x,x)
```

```
[Out] int(f^(c/(a + b*x)^3)*x, x)
```

3.236 $\int f^{\frac{c}{(a+bx)^3}}\,dx$

Optimal. Leaf size=44

$$\frac{(a+bx)\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}}{3b}$$

```
[Out] 1/3*(b*x+a)*GAMMA(-1/3,-c*ln(f)/(b*x+a)^3)*(-c*ln(f)/(b*x+a)^3)^(1/3)/b
```

Rubi [A]
time = 0.00, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2239}

$$\frac{(a+bx)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}\,\text{Gamma}\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x)^3),x]
```

```
[Out] ((a + b*x)*Gamma[-1/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f])/(a + b*x)^3
))^(1/3))/(3*b)
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] && !IntegerQ[2/n]
```

Rubi steps

$$\int f^{\frac{c}{(a+bx)^3}}\,dx=\frac{(a+bx)\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}}{3b}$$

Mathematica [A]
time = 0.01, size = 44, normalized size = 1.00

$$\frac{(a+bx)\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}}{3b}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x)^3),x]
```

```
[Out] ((a + b*x)*Gamma[-1/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f])/(a + b*x)^3
))^(1/3))/(3*b)
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(bx+a)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a)^3),x)
```

```
[Out] int(f^(c/(b*x+a)^3),x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3),x, algorithm="maxima")
```

```
[Out] 3*b*c*integrate(f^(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))*x/(b^4*x^4
+ 4*a*b^3*x^3 + 6*a^2*b^2*x^2 + 4*a^3*b*x + a^4), x)*log(f) + f^(c/(b^3*x^3
 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))*x
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 94 vs. $2(38) = 76$.
time = 0.10, size = 94, normalized size = 2.14

$$-\frac{b\left(-\frac{c\log(f)}{b^3}\right)^{\frac{1}{3}}\Gamma\left(\frac{2}{3},-\frac{c\log(f)}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}\right)-(bx+a)f^{\frac{c}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3),x, algorithm="fricas")
```

```
[Out] -(b*(-c*log(f)/b^3)^(1/3)*gamma(2/3, -c*log(f)/(b^3*x^3 + 3*a*b^2*x^2 + 3*a
^2*b*x + a^3)) - (b*x + a)*f^(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)))
/b
```

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

$$\int f^{\frac{c}{(a+bx)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**3),x)
```

```
[Out] Integral(f**(c/(a + b*x)**3), x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3),x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a)^3), x)
```

Mupad [B]
time = 3.97, size = 68, normalized size = 1.55

$$\frac{(a+b\,x)\,\left(\Gamma\!\left(\frac{2}{3}\right)\,{\left(-\frac{c\,\ln(f)}{{(a+b\,x)}^3}\right)}^{1/3}-\Gamma\!\left(\frac{2}{3},-\frac{c\,\ln(f)}{{(a+b\,x)}^3}\right)\,{\left(-\frac{c\,\ln(f)}{{(a+b\,x)}^3}\right)}^{1/3}+f^{\frac{c}{{(a+b\,x)}^3}}\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^3),x)
```

```
[Out] ((a + b*x)*(gamma(2/3)*(-(c*log(f))/(a + b*x)^3)^(1/3) - igamma(2/3, -(c*lo
g(f))/(a + b*x)^3)*(-(c*log(f))/(a + b*x)^3)^(1/3) + f^(c/(a + b*x)^3)))/b
```

3.237 $\int \frac{f^{\frac{c}{(a+bx)^3}}}{x}\,dx$

Optimal. Leaf size=18

$$\operatorname{Int}\left(\frac{f^{\frac{c}{(a+bx)^3}}}{x},x\right)$$

[Out] Unintegrable(f^(c/(b*x+a)^3)/x,x)

Rubi [A]
time = 0.01, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{f^{\frac{c}{(a+bx)^3}}}{x}\,dx$$

Verification is not applicable to the result.

[In] Int[f^(c/(a + b*x)^3)/x,x]

[Out] Defer[Int][f^(c/(a + b*x)^3)/x, x]

Rubi steps

$$\int \frac{f^{\frac{c}{(a+bx)^3}}}{x}\,dx = \int \frac{f^{\frac{c}{(a+bx)^3}}}{x}\,dx$$

Mathematica [A]
time = 0.05, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(a+bx)^3}}}{x}\,dx$$

Verification is not applicable to the result.

[In] Integrate[f^(c/(a + b*x)^3)/x,x]

[Out] Integrate[f^(c/(a + b*x)^3)/x, x]

Maple [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(bx+a)^3}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a)^3)/x,x)
```

```
[Out] int(f^(c/(b*x+a)^3)/x,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)/x,x, algorithm="maxima")
```

```
[Out] integrate(f^(c/(b*x + a)^3)/x, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)/x,x, algorithm="fricas")
```

```
[Out] integral(f^(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))/x, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(a+bx)^3}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**3)/x,x)
```

```
[Out] Integral(f**(c/(a + b*x)**3)/x, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)/x,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a)^3)/x, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{f^{\frac{c}{(a+b\,x)^3}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^3)/x,x)
```

```
[Out] int(f^(c/(a + b*x)^3)/x, x)
```

3.238 $\int \frac{f^{\frac{c}{(a+bx)^3}}}{x^2}\,dx$

Optimal. Leaf size=18

$$\text{Int}\left(\frac{f^{\frac{c}{(a+bx)^3}}}{x^2},x\right)$$

```
[Out] CannotIntegrate(f^(c/(b*x+a)^3)/x^2,x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{f^{\frac{c}{(a+bx)^3}}}{x^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[f^(c/(a + b*x)^3)/x^2,x]
```

```
[Out] Defer[Int][f^(c/(a + b*x)^3)/x^2, x]
```

Rubi steps

$$\int \frac{f^{\frac{c}{(a+bx)^3}}}{x^2}\,dx = \int \frac{f^{\frac{c}{(a+bx)^3}}}{x^2}\,dx$$

Mathematica [A]
time = 0.18, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(a+bx)^3}}}{x^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[f^(c/(a + b*x)^3)/x^2,x]
```

```
[Out] Integrate[f^(c/(a + b*x)^3)/x^2, x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(bx+a)^3}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a)^3)/x^2,x)
```

```
[Out] int(f^(c/(b*x+a)^3)/x^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^(c/(b*x + a)^3)/x^2, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral(f^(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))/x^2, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(a+bx)^3}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**3)/x**2,x)
```

```
[Out] Integral(f**(c/(a + b*x)**3)/x**2, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(f^(c/(b*x + a)^3)/x^2, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{f^{\frac{c}{(a+b\,x)^3}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^3)/x^2,x)
```

```
[Out] int(f^(c/(a + b*x)^3)/x^2, x)
```

3.239 $\int \frac{f^{\frac{c}{(a+bx)^3}}}{x^3} dx$

Optimal. Leaf size=18

$$\text{Int}\left(\frac{f^{\frac{c}{(a+bx)^3}}}{x^3}, x\right)$$

```
[Out] CannotIntegrate(f^(c/(b*x+a)^3)/x^3,x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{f^{\frac{c}{(a+bx)^3}}}{x^3} dx$$

Verification is not applicable to the result.

```
[In] Int[f^(c/(a + b*x)^3)/x^3,x]
```

```
[Out] Defer[Int][f^(c/(a + b*x)^3)/x^3, x]
```

Rubi steps

$$\int \frac{f^{\frac{c}{(a+bx)^3}}}{x^3} dx = \int \frac{f^{\frac{c}{(a+bx)^3}}}{x^3} dx$$

Mathematica [A]
time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(a+bx)^3}}}{x^3} dx$$

Verification is not applicable to the result.

```
[In] Integrate[f^(c/(a + b*x)^3)/x^3,x]
```

```
[Out] Integrate[f^(c/(a + b*x)^3)/x^3, x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(bx+a)^3}}}{x^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a)^3)/x^3,x)
[Out] int(f^(c/(b*x+a)^3)/x^3,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)/x^3,x, algorithm="maxima")
[Out] integrate(f^(c/(b*x + a)^3)/x^3, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)/x^3,x, algorithm="fricas")
[Out] integral(f^(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))/x^3, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(a+bx)^3}}}{x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**3)/x**3,x)
[Out] Integral(f**(c/(a + b*x)**3)/x**3, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)/x^3,x, algorithm="giac")
[Out] integrate(f^(c/(b*x + a)^3)/x^3, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{f^{\frac{c}{(a+b\,x)^3}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^3)/x^3,x)
```

```
[Out] int(f^(c/(a + b*x)^3)/x^3, x)
```

3.240 $\int f^{c(a+bx)^3} x^m \, dx$

Optimal. Leaf size=18

$$\text{Int}\left(f^{c(a+bx)^3}x^m,x\right)$$

```
[Out] CannotIntegrate(f^(c*(b*x+a)^3)*x^m,x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int f^{c(a+bx)^3}x^m \, dx$$

Verification is not applicable to the result.

```
[In] Int[f^(c*(a + b*x)^3)*x^m,x]
```

```
[Out] Defer[Int][f^(c*(a + b*x)^3)*x^m, x]
```

Rubi steps

$$\int f^{c(a+bx)^3}x^m \, dx = \int f^{c(a+bx)^3}x^m \, dx$$

Mathematica [A]
time = 0.19, size = 0, normalized size = 0.00

$$\int f^{c(a+bx)^3}x^m \, dx$$

Verification is not applicable to the result.

```
[In] Integrate[f^(c*(a + b*x)^3)*x^m,x]
```

```
[Out] Integrate[f^(c*(a + b*x)^3)*x^m, x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int f^{c(bx+a)^3}x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^3)*x^m,x)
[Out] int(f^(c*(b*x+a)^3)*x^m,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)*x^m,x, algorithm="maxima")
[Out] integrate(f^((b*x + a)^3*c)*x^m, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)*x^m,x, algorithm="fricas")
[Out] integral(f^(b^3*c*x^3 + 3*a*b^2*c*x^2 + 3*a^2*b*c*x + a^3*c)*x^m, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{c(a+bx)^3}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**3)*x**m,x)
[Out] Integral(f**(c*(a + b*x)**3)*x**m, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)*x^m,x, algorithm="giac")
[Out] integrate(f^((b*x + a)^3*c)*x^m, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.06

$$\int f^{c\,{\left(a+b\,x\right)}^3}\,x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^3)*x^m,x)
```

```
[Out] int(f^(c*(a + b*x)^3)*x^m, x)
```

3.241 $\int f^{c(a+bx)^2} x^m \, dx$

Optimal. Leaf size=29

$$\text{Int}\left(f^{a^2c+2abcx+b^2cx^2}x^m,x\right)$$

```
[Out] Unintegrable(f^(b^2*c*x^2+2*a*b*c*x+a^2*c)*x^m,x)
```

Rubi [A]
time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int f^{c(a+bx)^2} x^m \, dx$$

Verification is not applicable to the result.

```
[In] Int[f^(c*(a + b*x)^2)*x^m,x]
[Out] Defer[Int][f^(a^2*c + 2*a*b*c*x + b^2*c*x^2)*x^m, x]
```

Rubi steps

$$\int f^{c(a+bx)^2} x^m \, dx = \int f^{a^2c+2abcx+b^2cx^2} x^m \, dx$$

Mathematica [A]
time = 0.12, size = 0, normalized size = 0.00

$$\int f^{c(a+bx)^2} x^m \, dx$$

Verification is not applicable to the result.

```
[In] Integrate[f^(c*(a + b*x)^2)*x^m,x]
[Out] Integrate[f^(c*(a + b*x)^2)*x^m, x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int f^{c(bx+a)^2} x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^2)*x^m,x)
[Out] int(f^(c*(b*x+a)^2)*x^m,x)
```

Maxima [**A**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)*x^m,x, algorithm="maxima")
[Out] integrate(f^((b*x + a)^2*c)*x^m, x)
```

Fricas [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)*x^m,x, algorithm="fricas")
[Out] integral(f^(b^2*c*x^2 + 2*a*b*c*x + a^2*c)*x^m, x)
```

Sympy [**A**]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{c(a+bx)^2}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**2)*x**m,x)
[Out] Integral(f**(c*(a + b*x)**2)*x**m, x)
```

Giac [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)*x^m,x, algorithm="giac")
[Out] integrate(f^((b*x + a)^2*c)*x^m, x)
```

Mupad [**A**]
time = 0.00, size = -1, normalized size = -0.03

$$\int f^{c\,{\left(a+b\,x\right)}^2}\,x^m \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^2)*x^m,x)
[Out] int(f^(c*(a + b*x)^2)*x^m, x)
```

3.242 $\int f^{c(a+bx)}x^m\,dx$

Optimal. Leaf size=41

$$\frac{f^{ac}x^m\Gamma(1+m,-bcx\log(f))(-bcx\log(f))^{-m}}{bc\log(f)}$$

```
[Out] f^(a*c)*x^m*GAMMA(1+m,-b*c*x*ln(f))/b/c/ln(f)/((-b*c*x*ln(f))^m)
```

Rubi [A]
time = 0.01, antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2212}

$$\frac{x^m f^{ac}(-bcx\log(f))^{-m}\text{Gamma}(m+1,-bcx\log(f))}{bc\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c*(a + b*x))*x^m,x]
```

```
[Out] (f^(a*c)*x^m*Gamma[1 + m, -(b*c*x*Log[f])])/(b*c*Log[f]*(-(b*c*x*Log[f]))^m
)
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rubi steps

$$\int f^{c(a+bx)}x^m\,dx = \frac{f^{ac}x^m\Gamma(1+m,-bcx\log(f))(-bcx\log(f))^{-m}}{bc\log(f)}$$

Mathematica [A]
time = 0.02, size = 36, normalized size = 0.88

$$-f^{ac}x^{1+m}\Gamma(1+m,-bcx\log(f))(-bcx\log(f))^{-1-m}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c*(a + b*x))*x^m,x]
```

[Out] -(f^(a*c)*x^(1 + m)*Gamma[1 + m, -(b*c*x*Log[f])]*(-(b*c*x*Log[f]))^(-1 - m
))

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 116 vs. $2(41) = 82$.
time = 0.03, size = 117, normalized size = 2.85

method	result
meijerg	$-\frac{f^{ca}(-cb)^{-m}\ln(f)^{-m-1}\left(x^{m}(-cb)^{m}\ln(f)^{m}m\Gamma(m)(-bcx\ln(f))^{-m}-x^{m}(-cb)^{m}\ln(f)^{m}\mathrm{e}^{bcx\ln(f)}-x^{m}(-cb)^{m}\ln(f)^{m}m(-bcx\ln(f)\right.}{cb}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(f^(c*(b*x+a))*x^m,x,method=_RETURNVERBOSE)

[Out] -f^(c*a)*(-c*b)^(-m)*ln(f)^(-m-1)/c/b*(x^m*(-c*b)^m*ln(f)^m*m*GAMMA(m)*(-b*
c*x*ln(f))^(-m)-x^m*(-c*b)^m*ln(f)^m*exp(b*c*x*ln(f))-x^m*(-c*b)^m*ln(f)^m*
m*(-b*c*x*ln(f))^(-m)*GAMMA(m,-b*c*x*ln(f)))

Maxima [A]
time = 0.07, size = 36, normalized size = 0.88

$$-(-bcx\log(f))^{-m-1}f^{ac}x^{m+1}\Gamma(m+1,-bcx\log(f))$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(c*(b*x+a))*x^m,x, algorithm="maxima")

[Out] -(-b*c*x*log(f))^(-m - 1)*f^(a*c)*x^(m + 1)*gamma(m + 1, -b*c*x*log(f))

Fricas [A]
time = 0.09, size = 39, normalized size = 0.95

$$\frac{e^{(ac\log(f)-m\log(-bc\log(f)))}\Gamma(m+1,-bcx\log(f))}{bc\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(c*(b*x+a))*x^m,x, algorithm="fricas")

[Out] e^(a*c*log(f) - m*log(-b*c*log(f)))*gamma(m + 1, -b*c*x*log(f))/(b*c*log(f)
)

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

$$\int f^{c(a+bx)}x^{m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a))*x**m,x)
```

```
[Out] Integral(f**(c*(a + b*x))*x**m, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a))*x^m,x, algorithm="giac")
```

```
[Out] integrate(f^((b*x + a)*c)*x^m, x)
```

Mupad [B]
time = 3.50, size = 41, normalized size = 1.00

$$\frac{f^{a\,c}\,x^m\,\Gamma(m+1,-b\,c\,x\,\ln\left(f\right))}{b\,c\,\ln\left(f\right)\,\left(-b\,c\,x\,\ln\left(f\right)\right)^m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x))*x^m,x)
```

```
[Out] (f^(a*c)*x^m*igamma(m + 1, -b*c*x*log(f)))/(b*c*log(f)*(-b*c*x*log(f))^m)
```

3.243 $\int f^{\frac{c}{a+bx}} x^m \, dx$

Optimal. Leaf size=18

$$\text{Int}\left(f^{\frac{c}{a+bx}} x^m, x\right)$$

```
[Out] CannotIntegrate(f^(c/(b*x+a))*x^m,x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int f^{\frac{c}{a+bx}} x^m \, dx$$

Verification is not applicable to the result.

```
[In] Int[f^(c/(a + b*x))*x^m,x]
```

```
[Out] Defer[Int][f^(c/(a + b*x))*x^m, x]
```

Rubi steps

$$\int f^{\frac{c}{a+bx}} x^m \, dx = \int f^{\frac{c}{a+bx}} x^m \, dx$$

Mathematica [A]
time = 0.03, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{a+bx}} x^m \, dx$$

Verification is not applicable to the result.

```
[In] Integrate[f^(c/(a + b*x))*x^m,x]
```

```
[Out] Integrate[f^(c/(a + b*x))*x^m, x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{bx+a}} x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a))*x^m,x)
[Out] int(f^(c/(b*x+a))*x^m,x)
```

Maxima [**A**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x^m,x, algorithm="maxima")
[Out] integrate(f^(c/(b*x + a))*x^m, x)
```

Fricas [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x^m,x, algorithm="fricas")
[Out] integral(f^(c/(b*x + a))*x^m, x)
```

Sympy [**A**]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{a+bx}}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a))*x**m,x)
[Out] Integral(f**(c/(a + b*x))*x**m, x)
```

Giac [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x^m,x, algorithm="giac")
[Out] integrate(f^(c/(b*x + a))*x^m, x)
```

Mupad [**A**]
time = 0.00, size = -1, normalized size = -0.06

$$\int f^{\frac{c}{a+b\,x}}\,x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x))*x^m,x)
[Out] int(f^(c/(a + b*x))*x^m, x)
```

3.244 $\int f^{\frac{c}{(a+bx)^2}} x^m \, dx$

Optimal. Leaf size=18

$$\text{Int}\left(f^{\frac{c}{(a+bx)^2}} x^m, x\right)$$

```
[Out] CannotIntegrate(f^(c/(b*x+a)^2)*x^m,x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int f^{\frac{c}{(a+bx)^2}} x^m \, dx$$

Verification is not applicable to the result.

```
[In] Int[f^(c/(a + b*x)^2)*x^m,x]
[Out] Defer[Int][f^(c/(a + b*x)^2)*x^m, x]
```

Rubi steps

$$\int f^{\frac{c}{(a+bx)^2}} x^m \, dx = \int f^{\frac{c}{(a+bx)^2}} x^m \, dx$$

Mathematica [A]
time = 0.06, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(a+bx)^2}} x^m \, dx$$

Verification is not applicable to the result.

```
[In] Integrate[f^(c/(a + b*x)^2)*x^m,x]
[Out] Integrate[f^(c/(a + b*x)^2)*x^m, x]
```

Maple [A]
time = 0.02, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(bx+a)^2}} x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a)^2)*x^m,x)
[Out] int(f^(c/(b*x+a)^2)*x^m,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x^m,x, algorithm="maxima")
[Out] integrate(f^(c/(b*x + a)^2)*x^m, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x^m,x, algorithm="fricas")
[Out] integral(f^(c/(b^2*x^2 + 2*a*b*x + a^2))*x^m, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(a+bx)^2}} x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**2)*x**m,x)
[Out] Integral(f**(c/(a + b*x)**2)*x**m, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x^m,x, algorithm="giac")
[Out] integrate(f^(c/(b*x + a)^2)*x^m, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.06

$$\int f^{\frac{c}{{(a+b\,x)}^2}}\,x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^2)*x^m,x)
```

```
[Out] int(f^(c/(a + b*x)^2)*x^m, x)
```

3.245 $\int f^{\frac{c}{(a+bx)^3}} x^m \, dx$

Optimal. Leaf size=18

$$\mathrm{Int}\left(f^{\frac{c}{(a+bx)^3}} x^m, x\right)$$

[Out] CannotIntegrate(f^(c/(b*x+a)^3)*x^m,x)

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int f^{\frac{c}{(a+bx)^3}} x^m \, dx$$

Verification is not applicable to the result.

[In] Int[f^(c/(a + b*x)^3)*x^m,x]

[Out] Defer[Int][f^(c/(a + b*x)^3)*x^m, x]

Rubi steps

$$\int f^{\frac{c}{(a+bx)^3}} x^m \, dx = \int f^{\frac{c}{(a+bx)^3}} x^m \, dx$$

Mathematica [A]
time = 0.06, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(a+bx)^3}} x^m \, dx$$

Verification is not applicable to the result.

[In] Integrate[f^(c/(a + b*x)^3)*x^m,x]

[Out] Integrate[f^(c/(a + b*x)^3)*x^m, x]

Maple [A]
time = 0.02, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(bx+a)^3}} x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a)^3)*x^m,x)
[Out] int(f^(c/(b*x+a)^3)*x^m,x)
```

Maxima [**A**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x^m,x, algorithm="maxima")
[Out] integrate(f^(c/(b*x + a)^3)*x^m, x)
```

Fricas [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x^m,x, algorithm="fricas")
[Out] integral(f^(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))*x^m, x)
```

Sympy [**A**]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(a+bx)^3}} x^m\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**3)*x**m,x)
[Out] Integral(f**(c/(a + b*x)**3)*x**m, x)
```

Giac [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x^m,x, algorithm="giac")
[Out] integrate(f^(c/(b*x + a)^3)*x^m, x)
```

Mupad [**A**]
time = 0.00, size = -1, normalized size = -0.06

$$\int f^{\frac{c}{{\left(a+b\,x\right)}^3}}\,x^m \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^3)*x^m,x)
[Out] int(f^(c/(a + b*x)^3)*x^m, x)
```

3.246 $\int f^{c(a+bx)^n} x^m \, dx$

Optimal. Leaf size=18

$$\text{Int}\left(f^{c(a+bx)^n} x^m, x\right)$$

```
[Out] CannotIntegrate(f^(c*(b*x+a)^n)*x^m,x)
```

Rubi [A]
time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int f^{c(a+bx)^n} x^m \, dx$$

Verification is not applicable to the result.

```
[In] Int[f^(c*(a + b*x)^n)*x^m,x]
```

```
[Out] Defer[Int][f^(c*(a + b*x)^n)*x^m, x]
```

Rubi steps

$$\int f^{c(a+bx)^n} x^m \, dx = \int f^{c(a+bx)^n} x^m \, dx$$

Mathematica [A]
time = 0.04, size = 0, normalized size = 0.00

$$\int f^{c(a+bx)^n} x^m \, dx$$

Verification is not applicable to the result.

```
[In] Integrate[f^(c*(a + b*x)^n)*x^m,x]
```

```
[Out] Integrate[f^(c*(a + b*x)^n)*x^m, x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int f^{c(bx+a)^n} x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^n)*x^m,x)
```

```
[Out] int(f^(c*(b*x+a)^n)*x^m,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)*x^m,x, algorithm="maxima")
[Out] integrate(f^((b*x + a)^n*c)*x^m, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)*x^m,x, algorithm="fricas")
[Out] integral(f^((b*x + a)^n*c)*x^m, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{c(a+bx)^n}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**n)*x**m,x)
[Out] Integral(f**(c*(a + b*x)**n)*x**m, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)*x^m,x, algorithm="giac")
[Out] integrate(f^((b*x + a)^n*c)*x^m, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.06

$$\int f^{c\,{\left(a+b\,x\right)}^n}\,x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^n)*x^m,x)
[Out] int(f^(c*(a + b*x)^n)*x^m, x)
```

3.247 $\int f^{c(a+bx)^n} x^3\,dx$

Optimal. Leaf size=207

$$-\frac{(a+bx)^4\Gamma\left(\frac{4}{n},-c(a+bx)^n\log(f)\right)\left(-c(a+bx)^n\log(f)\right)^{-4/n}}{b^4n}+\frac{3a(a+bx)^3\Gamma\left(\frac{3}{n},-c(a+bx)^n\log(f)\right)\left(-c(a\right.}{b^4n}$$

```
[Out] -(b*x+a)^4*GAMMA(4/n,-c*(b*x+a)^n*ln(f))/b^4/n/((-c*(b*x+a)^n*ln(f))^(4/n))
+3*a*(b*x+a)^3*GAMMA(3/n,-c*(b*x+a)^n*ln(f))/b^4/n/((-c*(b*x+a)^n*ln(f))^(3
/n))-3*a^2*(b*x+a)^2*GAMMA(2/n,-c*(b*x+a)^n*ln(f))/b^4/n/((-c*(b*x+a)^n*ln(
f))^(2/n))+a^3*(b*x+a)*GAMMA(1/n,-c*(b*x+a)^n*ln(f))/b^4/n/((-c*(b*x+a)^n*l
n(f))^(1/n))
```

Rubi [A]
time = 0.11, antiderivative size = 207, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2258, 2239, 2250}

$$\frac{a^3(a+bx)\left(-c\log(f)(a+bx)^n\right)^{-1/n}\text{Gamma}\left(\frac{1}{n},-c\log(f)(a+bx)^n\right)}{b^4n}-\frac{3a^2(a+bx)^2\left(-c\log(f)(a+bx)^n\right)^{-2/n}\text{Gamma}\left(\frac{2}{n},-c\log(f)(a+bx)^n\right)}{b^4n}-\frac{(a+bx)^4\left(-c\log(f)(a+bx)^n\right)^{-4/n}\text{Gamma}\left(\frac{4}{n},-c\log(f)(a+bx)^n\right)}{b^4n}+\frac{3a(a+bx)^3\left(-c\log(f)(a+bx)^n\right)^{-3/n}\text{Gamma}\left(\frac{3}{n},-c\log(f)(a+bx)^n\right)}{b^4n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c*(a + b*x)^n)*x^3,x]
```

```
[Out] -(((a + b*x)^4*Gamma[4/n, -(c*(a + b*x)^n*Log[f])])/(b^4*n*(-(c*(a + b*x)^n
*Log[f]))^(4/n))) + (3*a*(a + b*x)^3*Gamma[3/n, -(c*(a + b*x)^n*Log[f])])/(
b^4*n*(-(c*(a + b*x)^n*Log[f]))^(3/n)) - (3*a^2*(a + b*x)^2*Gamma[2/n, -(c*
(a + b*x)^n*Log[f])])/(b^4*n*(-(c*(a + b*x)^n*Log[f]))^(2/n)) + (a^3*(a + b
*x)*Gamma[n^(-1), -(c*(a + b*x)^n*Log[f])])/(b^4*n*(-(c*(a + b*x)^n*Log[f])
)^n^(-1))
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
```

```
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\begin{aligned}\int f^{c(a+bx)^n}x^3\,dx &= \int \left(-\frac{a^3 f^{c(a+bx)^n}}{b^3}+\frac{3a^2 f^{c(a+bx)^n}(a+bx)}{b^3}-\frac{3af^{c(a+bx)^n}(a+bx)^2}{b^3}+\frac{f^{c(a+bx)^n}(a+bx)^3}{b^3}\right) \\ &= \frac{\int f^{c(a+bx)^n}(a+bx)^3\,dx}{b^3}-\frac{(3a)\int f^{c(a+bx)^n}(a+bx)^2\,dx}{b^3}+\frac{(3a^2)\int f^{c(a+bx)^n}(a+bx)\,dx}{b^3}- \\ &= -\frac{(a+bx)^4\Gamma\left(\frac{4}{n},-c(a+bx)^n\log(f)\right)\left(-c(a+bx)^n\log(f)\right)^{-4/n}}{b^4n}+\frac{3a(a+bx)^3\Gamma\left(\frac{3}{n},-c(a+\right.}{}\end{aligned}$$

Mathematica [A]
time = 0.10, size = 183, normalized size = 0.88

$$-\frac{(a+bx)\left(-c(a+bx)^n\log(f)\right)^{-4/n}\left((a+bx)^3\Gamma\left(\frac{4}{n},-c(a+bx)^n\log(f)\right)-a(-c(a+bx)^n\log(f))^{\frac{1}{n}}\left(3(a+bx)^2\Gamma\left(\frac{3}{n},-c(a+bx)^n\log(f)\right)+a(-c(a+bx)^n\log(f))^{\frac{1}{n}}\left(-3(a+bx)\Gamma\left(\frac{2}{n},-c(a+bx)^n\log(f)\right)+a\Gamma\left(\frac{1}{n},-c(a+bx)^n\log(f)\right)\left(-c(a+bx)^n\log(f)\right)^{\frac{1}{n}}\right)\right)\right)}{b^4n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c*(a + b*x)^n)*x^3,x]
```

```
[Out] -(((a + b*x)*((a + b*x)^3*Gamma[4/n, -(c*(a + b*x)^n*Log[f])] - a*(-(c*(a +
 b*x)^n*Log[f]))^n^(-1)*(3*(a + b*x)^2*Gamma[3/n, -(c*(a + b*x)^n*Log[f])]
+ a*(-(c*(a + b*x)^n*Log[f]))^n^(-1)*(-3*(a + b*x)*Gamma[2/n, -(c*(a + b*x)
^n*Log[f])] + a*Gamma[n^(-1), -(c*(a + b*x)^n*Log[f])]*(-(c*(a + b*x)^n*Log
[f]))^n^(-1)))))/(b^4*n*(-(c*(a + b*x)^n*Log[f]))^(4/n)))
```

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

$$\int f^{c(bx+a)^n}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^n)*x^3,x)
```

```
[Out] int(f^(c*(b*x+a)^n)*x^3,x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)*x^3,x, algorithm="maxima")
[Out] integrate(f^((b*x + a)^n*c)*x^3, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)*x^3,x, algorithm="fricas")
[Out] integral(f^((b*x + a)^n*c)*x^3, x)
```

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

$$\int f^{c(a+bx)^n}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**n)*x**3,x)
[Out] Integral(f**(c*(a + b*x)**n)*x**3, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)*x^3,x, algorithm="giac")
[Out] integrate(f^((b*x + a)^n*c)*x^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int f^{c\,(a+b\,x)^n}\,x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^n)*x^3,x)
[Out] int(f^(c*(a + b*x)^n)*x^3, x)
```

3.248 $\int f^{c(a+bx)^n} x^2 \, dx$

Optimal. Leaf size=154

$$-\frac{(a+bx)^3\Gamma\left(\frac{3}{n},-c(a+bx)^n\log(f)\right)(-c(a+bx)^n\log(f))^{-3/n}}{b^3n}+\frac{2a(a+bx)^2\Gamma\left(\frac{2}{n},-c(a+bx)^n\log(f)\right)(-c(a}{b^3n}$$

```
[Out] -(b*x+a)^3*GAMMA(3/n,-c*(b*x+a)^n*ln(f))/b^3/n/((-c*(b*x+a)^n*ln(f))^(3/n))
+2*a*(b*x+a)^2*GAMMA(2/n,-c*(b*x+a)^n*ln(f))/b^3/n/((-c*(b*x+a)^n*ln(f))^(2
/n))-a^2*(b*x+a)*GAMMA(1/n,-c*(b*x+a)^n*ln(f))/b^3/n/((-c*(b*x+a)^n*ln(f))^
(1/n))
```

Rubi [A]

time = 0.08, antiderivative size = 154, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2258, 2239, 2250}

$$-\frac{a^2(a+bx)\left(-c\log(f)(a+bx)^n\right)^{-1/n}\text{Gamma}\left(\frac{1}{n},-c\log(f)(a+bx)^n\right)}{b^3n}-\frac{(a+bx)^3\left(-c\log(f)(a+bx)^n\right)^{-3/n}\text{Gamma}\left(\frac{3}{n},-c\log(f)(a+bx)^n\right)}{b^3n}+\frac{2a(a+bx)^2\left(-c\log(f)(a+bx)^n\right)^{-2/n}\text{Gamma}\left(\frac{2}{n},-c\log(f)(a+bx)^n\right)}{b^3n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c*(a + b*x)^n)*x^2,x]
```

```
[Out] -(((a + b*x)^3*Gamma[3/n, -(c*(a + b*x)^n*Log[f])])/(b^3*n*(-(c*(a + b*x)^n
*Log[f]))^(3/n))) + (2*a*(a + b*x)^2*Gamma[2/n, -(c*(a + b*x)^n*Log[f])])/(
b^3*n*(-(c*(a + b*x)^n*Log[f]))^(2/n)) - (a^2*(a + b*x)*Gamma[n^(-1), -(c*(
a + b*x)^n*Log[f])])/(b^3*n*(-(c*(a + b*x)^n*Log[f]))^n^(-1))
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$
\begin{aligned}
\int f^{c(a+bx)^n} x^2\,dx &= \int \left(\frac{a^2 f^{c(a+bx)^n}}{b^2} - \frac{2a f^{c(a+bx)^n}(a+bx)}{b^2} + \frac{f^{c(a+bx)^n}(a+bx)^2}{b^2}\right) dx \\
&= \frac{\int f^{c(a+bx)^n}(a+bx)^2\,dx}{b^2} - \frac{(2a)\int f^{c(a+bx)^n}(a+bx)\,dx}{b^2} + \frac{a^2\int f^{c(a+bx)^n}\,dx}{b^2} \\
&= -\frac{(a+bx)^3\Gamma\left(\frac{3}{n}, -c(a+bx)^n\log(f)\right)\left(-c(a+bx)^n\log(f)\right)^{-3/n}}{b^3 n} + \frac{2a(a+bx)^2\Gamma\left(\frac{2}{n}, -c(a\right.}{}
\end{aligned}
$$

Mathematica [A]
time = 0.05, size = 136, normalized size = 0.88

$$
-\frac{(a+bx)\left(-c(a+bx)^n\log(f)\right)^{-3/n}\left((a+bx)^2\Gamma\left(\frac{3}{n}, -c(a+bx)^n\log(f)\right) + a\left(-c(a+bx)^n\log(f)\right)^{\frac{1}{n}}\left(-2(a+bx)\Gamma\left(\frac{2}{n}, -c(a+bx)^n\log(f)\right) + a\Gamma\left(\frac{1}{n}, -c(a+bx)^n\log(f)\right)\left(-c(a+bx)^n\log(f)\right)^{\frac{1}{n}}\right)\right)}{b^3 n}
$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c*(a + b*x)^n)*x^2,x]
```

```
[Out] -(((a + b*x)*((a + b*x)^2*Gamma[3/n, -(c*(a + b*x)^n*Log[f])] + a*(-(c*(a +
 b*x)^n*Log[f]))^n^(-1)*(-2*(a + b*x)*Gamma[2/n, -(c*(a + b*x)^n*Log[f])] +
 a*Gamma[n^(-1), -(c*(a + b*x)^n*Log[f])]*(-(c*(a + b*x)^n*Log[f]))^n^(-1))
))/(b^3*n*(-(c*(a + b*x)^n*Log[f]))^(3/n)))
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$
\int f^{c(bx+a)^n} x^2\,dx
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^n)*x^2,x)
```

```
[Out] int(f^(c*(b*x+a)^n)*x^2,x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)*x^2,x, algorithm="maxima")
```

```
[Out] integrate(f^((b*x + a)^n*c)*x^2, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)*x^2,x, algorithm="fricas")
```

```
[Out] integral(f^((b*x + a)^n*c)*x^2, x)
```

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

$$\int f^{c(a+bx)^n} x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**n)*x**2,x)
```

```
[Out] Integral(f**(c*(a + b*x)**n)*x**2, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)*x^2,x, algorithm="giac")
```

```
[Out] integrate(f^((b*x + a)^n*c)*x^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int f^{c\,(a+b\,x)^n}\,x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^n)*x^2,x)
```

```
[Out] int(f^(c*(a + b*x)^n)*x^2, x)
```

3.249 $\int f^{c(a+bx)^n}x\,dx$

Optimal. Leaf size=99

$$-\frac{(a+bx)^2\Gamma\left(\frac{2}{n},-c(a+bx)^n\log(f)\right)\left(-c(a+bx)^n\log(f)\right)^{-2/n}}{b^2n}+\frac{a(a+bx)\Gamma\left(\frac{1}{n},-c(a+bx)^n\log(f)\right)\left(-c(a+\right.}{b^2n}$$

```
[Out] -(b*x+a)^2*GAMMA(2/n,-c*(b*x+a)^n*ln(f))/b^2/n/((-c*(b*x+a)^n*ln(f))^(2/n))
+a*(b*x+a)*GAMMA(1/n,-c*(b*x+a)^n*ln(f))/b^2/n/((-c*(b*x+a)^n*ln(f))^(1/n))
```

Rubi [A]
time = 0.04, antiderivative size = 99, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$, Rules used = {2258, 2239, 2250}

$$\frac{a(a+bx)\left(-c\log(f)(a+bx)^n\right)^{-1/n}\text{Gamma}\left(\frac{1}{n},-c\log(f)(a+bx)^n\right)}{b^2n}-\frac{(a+bx)^2\left(-c\log(f)(a+bx)^n\right)^{-2/n}\text{Gamma}\left(\frac{2}{n},-c\log(f)(a+bx)^n\right)}{b^2n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c*(a + b*x)^n)*x,x]
```

```
[Out] -(((a + b*x)^2*Gamma[2/n, -(c*(a + b*x)^n*Log[f])])/(b^2*n*(-(c*(a + b*x)^n
*Log[f]))^(2/n))) + (a*(a + b*x)*Gamma[n^(-1), -(c*(a + b*x)^n*Log[f])])/(b
^2*n*(-(c*(a + b*x)^n*Log[f]))^n^(-1))
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{c(a+bx)^n} x \, dx = \int \left(-\frac{a f^{c(a+bx)^n}}{b} + \frac{f^{c(a+bx)^n}(a+bx)}{b} \right) dx$$
$$= \frac{\int f^{c(a+bx)^n}(a+bx) \, dx}{b} - \frac{a \int f^{c(a+bx)^n} \, dx}{b}$$
$$= -\frac{(a+bx)^2 \Gamma\left(\frac{2}{n}, -c(a+bx)^n \log(f)\right) (-c(a+bx)^n \log(f))^{-2/n}}{b^2 n} + \frac{a(a+bx)\Gamma\left(\frac{1}{n}, -c(a+ba\right.}{}$$

Mathematica [A]
time = 0.02, size = 91, normalized size = 0.92

$$-\frac{(a+bx)(-c(a+bx)^n \log(f))^{-2/n} \left((a+bx)\Gamma\left(\frac{2}{n}, -c(a+bx)^n \log(f)\right) - a\Gamma\left(\frac{1}{n}, -c(a+bx)^n \log(f)\right)(-c(a+bx)^n \log(f))^{\frac{1}{n}}\right)}{b^2 n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c*(a + b*x)^n)*x,x]
```

```
[Out] -(((a + b*x)*((a + b*x)*Gamma[2/n, -(c*(a + b*x)^n*Log[f])] - a*Gamma[n^(-1
), -(c*(a + b*x)^n*Log[f])]*(-(c*(a + b*x)^n*Log[f]))^n^(-1)))/(b^2*n*(-(c*
(a + b*x)^n*Log[f]))^(2/n)))
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int f^{c(bx+a)^n} x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^n)*x,x)
```

```
[Out] int(f^(c*(b*x+a)^n)*x,x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)*x,x, algorithm="maxima")
```

```
[Out] integrate(f^((b*x + a)^n*c)*x, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)*x,x, algorithm="fricas")
```

```
[Out] integral(f^((b*x + a)^n*c)*x, x)
```

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

$$\int f^{c(a+bx)^n} x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**n)*x,x)
```

```
[Out] Integral(f**(c*(a + b*x)**n)*x, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)*x,x, algorithm="giac")
```

```
[Out] integrate(f^((b*x + a)^n*c)*x, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int f^{c\,{(a+b\,x)}^n}\,x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^n)*x,x)
```

```
[Out] int(f^(c*(a + b*x)^n)*x, x)
```

3.250 $\int f^{c(a+bx)^n}\,dx$

Optimal. Leaf size=47

$$-\frac{(a+bx)\Gamma\left(\frac{1}{n},-c(a+bx)^n\log(f)\right)\left(-c(a+bx)^n\log(f)\right)^{-1/n}}{bn}$$

```
[Out] -(b*x+a)*GAMMA(1/n,-c*(b*x+a)^n*ln(f))/b/n/((-c*(b*x+a)^n*ln(f))^(1/n))
```

Rubi [A]
time = 0.00, antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2239}

$$-\frac{(a+bx)\left(-c\log(f)(a+bx)^n\right)^{-1/n}\text{Gamma}\left(\frac{1}{n},-c\log(f)(a+bx)^n\right)}{bn}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c*(a + b*x)^n),x]
```

```
[Out] -(((a + b*x)*Gamma[n^(-1), -(c*(a + b*x)^n*Log[f])])/(b*n*(-(c*(a + b*x)^n*
Log[f]))^n^(-1)))
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rubi steps

$$\int f^{c(a+bx)^n}\,dx = -\frac{(a+bx)\Gamma\left(\frac{1}{n},-c(a+bx)^n\log(f)\right)\left(-c(a+bx)^n\log(f)\right)^{-1/n}}{bn}$$

Mathematica [A]
time = 0.01, size = 47, normalized size = 1.00

$$-\frac{(a+bx)\Gamma\left(\frac{1}{n},-c(a+bx)^n\log(f)\right)\left(-c(a+bx)^n\log(f)\right)^{-1/n}}{bn}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c*(a + b*x)^n),x]
```

[Out] -(((a + b*x)*Gamma[n^(-1), -(c*(a + b*x)^n*Log[f])])/(b*n*(-(c*(a + b*x)^n*Log[f]))^n^(-1)))

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int f^{c(bx+a)^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^n),x)
[Out] int(f^(c*(b*x+a)^n),x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n),x, algorithm="maxima")
[Out] integrate(f^((b*x + a)^n*c), x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n),x, algorithm="fricas")
[Out] integral(f^((b*x + a)^n*c), x)
```

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

$$\int f^{c(a+bx)^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**n),x)
[Out] Integral(f**(c*(a + b*x)**n), x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n),x, algorithm="giac")
```

```
[Out] integrate(f^((b*x + a)^n*c), x)
```

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

$$\int f^{c\,(a+b\,x)^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^n),x)
```

```
[Out] int(f^(c*(a + b*x)^n), x)
```

3.251 $\int \frac{f^{c(a+bx)^n}}{x} \, dx$

Optimal. Leaf size=18

$$\text{Int}\left(\frac{f^{c(a+bx)^n}}{x},x\right)$$

```
[Out] Unintegrable(f^(c*(b*x+a)^n)/x,x)
```

Rubi [A]
time = 0.01, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{f^{c(a+bx)^n}}{x} \, dx$$

Verification is not applicable to the result.

```
[In] Int[f^(c*(a + b*x)^n)/x,x]
```

```
[Out] Defer[Int][f^(c*(a + b*x)^n)/x, x]
```

Rubi steps

$$\int \frac{f^{c(a+bx)^n}}{x} \, dx = \int \frac{f^{c(a+bx)^n}}{x} \, dx$$

Mathematica [A]
time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^n}}{x} \, dx$$

Verification is not applicable to the result.

```
[In] Integrate[f^(c*(a + b*x)^n)/x,x]
```

```
[Out] Integrate[f^(c*(a + b*x)^n)/x, x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{f^{c(bx+a)^n}}{x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^n)/x,x)
```

```
[Out] int(f^(c*(b*x+a)^n)/x,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)/x,x, algorithm="maxima")
```

```
[Out] integrate(f^((b*x + a)^n*c)/x, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)/x,x, algorithm="fricas")
```

```
[Out] integral(f^((b*x + a)^n*c)/x, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^n}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**n)/x,x)
```

```
[Out] Integral(f**(c*(a + b*x)**n)/x, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)/x,x, algorithm="giac")
```

```
[Out] integrate(f^((b*x + a)^n*c)/x, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{f^{c\,(a+b\,x)^n}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^n)/x,x)
```

```
[Out] int(f^(c*(a + b*x)^n)/x, x)
```

3.252 $\int \frac{f^{c(a+bx)^n}}{x^2} dx$

Optimal. Leaf size=18

$$\text{Int}\left(\frac{f^{c(a+bx)^n}}{x^2}, x\right)$$

```
[Out] CannotIntegrate(f^(c*(b*x+a)^n)/x^2,x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{f^{c(a+bx)^n}}{x^2} dx$$

Verification is not applicable to the result.

```
[In] Int[f^(c*(a + b*x)^n)/x^2,x]
```

```
[Out] Defer[Int][f^(c*(a + b*x)^n)/x^2, x]
```

Rubi steps

$$\int \frac{f^{c(a+bx)^n}}{x^2} dx = \int \frac{f^{c(a+bx)^n}}{x^2} dx$$

Mathematica [A]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^n}}{x^2} dx$$

Verification is not applicable to the result.

```
[In] Integrate[f^(c*(a + b*x)^n)/x^2,x]
```

```
[Out] Integrate[f^(c*(a + b*x)^n)/x^2, x]
```

Maple [A]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{f^{c(bx+a)^n}}{x^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^n)/x^2,x)
[Out] int(f^(c*(b*x+a)^n)/x^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)/x^2,x, algorithm="maxima")
[Out] integrate(f^((b*x + a)^n*c)/x^2, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)/x^2,x, algorithm="fricas")
[Out] integral(f^((b*x + a)^n*c)/x^2, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^n}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**n)/x**2,x)
[Out] Integral(f**(c*(a + b*x)**n)/x**2, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)/x^2,x, algorithm="giac")
[Out] integrate(f^((b*x + a)^n*c)/x^2, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{f^{c\,{\left(a+b\,x\right)}^n}}{x^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^n)/x^2,x)
[Out] int(f^(c*(a + b*x)^n)/x^2, x)
```

3.253 $\int \frac{f^{c(a+bx)^n}}{x^3}\,dx$

Optimal. Leaf size=18

$$\operatorname{Int}\left(\frac{f^{c(a+bx)^n}}{x^3},x\right)$$

```
[Out] CannotIntegrate(f^(c*(b*x+a)^n)/x^3,x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{f^{c(a+bx)^n}}{x^3}\,dx$$

Verification is not applicable to the result.

```
[In] Int[f^(c*(a + b*x)^n)/x^3,x]
[Out] Defer[Int][f^(c*(a + b*x)^n)/x^3, x]
```

Rubi steps

$$\int \frac{f^{c(a+bx)^n}}{x^3}\,dx = \int \frac{f^{c(a+bx)^n}}{x^3}\,dx$$

Mathematica [A]
time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^n}}{x^3}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[f^(c*(a + b*x)^n)/x^3,x]
[Out] Integrate[f^(c*(a + b*x)^n)/x^3, x]
```

Maple [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{c(bx+a)^n}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^n)/x^3,x)
[Out] int(f^(c*(b*x+a)^n)/x^3,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)/x^3,x, algorithm="maxima")
[Out] integrate(f^((b*x + a)^n*c)/x^3, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)/x^3,x, algorithm="fricas")
[Out] integral(f^((b*x + a)^n*c)/x^3, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^n}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**n)/x**3,x)
[Out] Integral(f**(c*(a + b*x)**n)/x**3, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)/x^3,x, algorithm="giac")
[Out] integrate(f^((b*x + a)^n*c)/x^3, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{f^{c\,(a+b\,x)^n}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^n)/x^3,x)
```

```
[Out] int(f^(c*(a + b*x)^n)/x^3, x)
```

3.254 $\int F^{a+b(c+dx)^2}(c+dx)^m\,dx$

Optimal. Leaf size=61

$$-\frac{F^a(c+dx)^{1+m}\Gamma\left(\frac{1+m}{2},-b(c+dx)^2\log(F)\right)\left(-b(c+dx)^2\log(F)\right)^{\frac{1}{2}(-1-m)}}{2d}$$

```
[Out] -1/2*F^a*(d*x+c)^(1+m)*GAMMA(1/2+1/2*m,-b*(d*x+c)^2*ln(F))*(-b*(d*x+c)^2*ln
(F))^(-1/2-1/2*m)/d
```

Rubi [A]
time = 0.04, antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$-\frac{F^a(c+dx)^{m+1}\left(-b\log(F)(c+dx)^2\right)^{\frac{1}{2}(-m-1)}\,\text{Gamma}\left(\frac{m+1}{2},-b\log(F)(c+dx)^2\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x)^m,x]
```

```
[Out] -1/2*(F^a*(c + d*x)^(1 + m)*Gamma[(1 + m)/2, -(b*(c + d*x)^2*Log[F])]*(-(b*
(c + d*x)^2*Log[F]))^((-1 - m)/2))/d
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)^m\,dx = -\frac{F^a(c+dx)^{1+m}\Gamma\left(\frac{1+m}{2},-b(c+dx)^2\log(F)\right)\left(-b(c+dx)^2\log(F)\right)^{\frac{1}{2}(-1-m)}}{2d}$$

Mathematica [A]
time = 0.13, size = 61, normalized size = 1.00

$$-\frac{F^a(c+dx)^{1+m}\Gamma\left(\frac{1+m}{2},-b(c+dx)^2\log(F)\right)\left(-b(c+dx)^2\log(F)\right)^{\frac{1}{2}(-1-m)}}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x)^m,x]
```

```
[Out] -1/2*(F^a*(c + d*x)^(1 + m)*Gamma[(1 + m)/2, -(b*(c + d*x)^2*Log[F])]*(-(b*
(c + d*x)^2*Log[F]))^((-1 - m)/2))/d
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int F^{a+b(dx+c)^2} (dx+c)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)*(d*x+c)^m,x)
```

```
[Out] int(F^(a+b*(d*x+c)^2)*(d*x+c)^m,x)
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^m,x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^m*F^((d*x + c)^2*b + a), x)
```

Fricas [A]
time = 0.09, size = 59, normalized size = 0.97

$$\frac{e^{\left(-\frac{1}{2}\,(m-1)\log(-b\log(F))+a\log(F)\right)}\Gamma\left(\frac{1}{2}\,m+\frac{1}{2},-\left(bd^2x^2+2\,bcdx+bc^2\right)\log\left(F\right)\right)}{2\,bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^m,x, algorithm="fricas")
```

```
[Out] 1/2*e^(-1/2*(m - 1)*log(-b*log(F)) + a*log(F))*gamma(1/2*m + 1/2, -(b*d^2*x
^2 + 2*b*c*d*x + b*c^2)*log(F))/(b*d*log(F))
```

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

$$\int F^{a+b(c+dx)^2} (c+dx)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c)**m,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)*(c + d*x)**m, x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^m,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^m*F^((d*x + c)^2*b + a), x)
```

Mupad [B]
time = 3.81, size = 75, normalized size = 1.23

$$\frac{F^a\,\mathrm{e}^{\frac{b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^2}{2}}\,{\left(c+d\,x\right)}^{m+1}\,\mathrm{M}_{\frac{1}{4}-\frac{m}{4},\frac{m}{4}+\frac{1}{4}}\left(b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^2\right)}{d\,\left(m+1\right)\,{\left(b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^2\right)}^{\frac{m}{4}+\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x)^m,x)
```

```
[Out] (F^a*exp((b*log(F)*(c + d*x)^2)/2)*(c + d*x)^(m + 1)*whittakerM(1/4 - m/4,
m/4 + 1/4, b*log(F)*(c + d*x)^2))/(d*(m + 1)*(b*log(F)*(c + d*x)^2)^(m/4 +
3/4))
```

3.255 $\int F^{a+b(c+dx)^2}(c+dx)^{11}\,dx$

Optimal. Leaf size=105

$$-\frac{F^{a+b(c+dx)^2}\left(120-120b(c+dx)^2\log(F)+60b^2(c+dx)^4\log^2(F)-20b^3(c+dx)^6\log^3(F)+5b^4(c+dx)^8\log^4(F)-b^5(c+dx)^{10}\log^5(F)\right)}{2b^6d\log^6(F)}$$

```
[Out] -1/2*F^(a+b*(d*x+c)^2)*(120-120*b*(d*x+c)^2*ln(F)+60*b^2*(d*x+c)^4*ln(F)^2-
20*b^3*(d*x+c)^6*ln(F)^3+5*b^4*(d*x+c)^8*ln(F)^4-b^5*(d*x+c)^10*ln(F)^5)/b^
6/d/ln(F)^6
```

Rubi [A]
time = 0.09, antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2249}

$$-\frac{F^{a+b(c+dx)^2}\left(-b^5\log^5(F)(c+dx)^{10}+5b^4\log^4(F)(c+dx)^8-20b^3\log^3(F)(c+dx)^6+60b^2\log^2(F)(c+dx)^4-120b\log(F)(c+dx)^2+120\right)}{2b^6d\log^6(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x)^11,x]
```

```
[Out] -1/2*(F^(a + b*(c + d*x)^2)*(120 - 120*b*(c + d*x)^2*Log[F] + 60*b^2*(c + d
*x)^4*Log[F]^2 - 20*b^3*(c + d*x)^6*Log[F]^3 + 5*b^4*(c + d*x)^8*Log[F]^4 -
 b^5*(c + d*x)^10*Log[F]^5))/(b^6*d*Log[F]^6)
```

Rule 2249

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> With[{p = Simplify[(m + 1)/n]}, Simp[(-F^a)*((f/d)^m/(d*n*
((-b)*Log[F])^p))*Simplify[FunctionExpand[Gamma[p, (-b)*(c + d*x)^n*Log[F]]
]], x] /; IGtQ[p, 0]] /; FreeQ[{F, a, b, c, d, e, f, m, n}, x] && EqQ[d*e -
 c*f, 0] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)^{11}\,dx=-\frac{F^a\Gamma\left(6,-b(c+dx)^2\log(F)\right)}{2b^6d\log^6(F)}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.37, size = 31, normalized size = 0.30

$$-\frac{F^a\Gamma\left(6,-b(c+dx)^2\log(F)\right)}{2b^6d\log^6(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x)^11,x]
```

```
[Out] -1/2*(F^a*Gamma[6, -(b*(c + d*x)^2*Log[F])])/(b^6*d*Log[F]^6)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 578 vs. $2(103) = 206$.
time = 0.11, size = 579, normalized size = 5.51 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)*(d*x+c)^11,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*(-120+120*ln(F)*b*c^2+120*ln(F)*b*d^2*x^2+240*ln(F)*b*c*d*x-140*ln(F)^4
*b^4*c^6*d^2*x^2-40*ln(F)^4*b^4*c^7*d*x+120*c*d^5*x^5*b^3*ln(F)^3+300*ln(F)
^3*b^3*c^2*d^4*x^4+400*ln(F)^3*b^3*c^3*d^3*x^3+300*ln(F)^3*b^3*c^4*d^2*x^2+
120*ln(F)^3*b^3*c^5*d*x-240*d^3*c*x^3*b^2*ln(F)^2-360*ln(F)^2*b^2*c^2*d^2*x
^2-240*ln(F)^2*b^2*c^3*d*x-5*ln(F)^4*b^4*c^8-60*ln(F)^2*b^2*c^4+20*ln(F)^3*
b^3*c^6+ln(F)^5*b^5*c^10-60*d^4*x^4*b^2*ln(F)^2+d^10*x^10*b^5*ln(F)^5-5*d^8
*x^8*b^4*ln(F)^4+20*d^6*x^6*b^3*ln(F)^3+10*d^9*c*x^9*b^5*ln(F)^5+45*ln(F)^5
*b^5*c^2*d^8*x^8+120*ln(F)^5*b^5*c^3*d^7*x^7+210*ln(F)^5*b^5*c^4*d^6*x^6+25
2*ln(F)^5*b^5*c^5*d^5*x^5+210*ln(F)^5*b^5*c^6*d^4*x^4+120*ln(F)^5*b^5*c^7*d
^3*x^3-40*c*d^7*x^7*b^4*ln(F)^4+45*ln(F)^5*b^5*c^8*d^2*x^2-140*ln(F)^4*b^4*
c^2*d^6*x^6+10*ln(F)^5*b^5*c^9*d*x-280*ln(F)^4*b^4*c^3*d^5*x^5-350*ln(F)^4*
b^4*c^4*d^4*x^4-280*ln(F)^4*b^4*c^5*d^3*x^3)*F^(b*d^2*x^2+2*b*c*d*x+b*c^2+a
)/b^6/ln(F)^6/d
```

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 1.75, size = 5261, normalized size = 50.10

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^11,x, algorithm="maxima")
```

```
[Out] -11/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)
/(b*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*lo
g(F)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)
*d))*F^a*c^10/sqrt(b*log(F)) + 55/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(er
f(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2
)*d^3*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2
/(b*d^2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma
(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(
-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*c^9*d/sqrt(b*log(F)) - 165
/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))) - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d)^2*l
og(F)/(b*d^2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/((b*lo
```

g(F))^(7/2)*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^2/((b*log(F))^(7/2)*d^3))*F^a*c^8*d^2/sqrt(b*log(F)) + 165*(sqrt(pi)*(b*d^2*x + b*c*d)*b^4*c^4*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^5/((b*log(F))^(9/2)*d^5*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 4*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^4*c^3*log(F)^4/((b*log(F))^(9/2)*d^4) - 6*(b*d^2*x + b*c*d)^3*b^2*c^2*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(9/2)*d^7*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 4*b^3*c*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(9/2)*d^4) - (b*d^2*x + b*c*d)^5*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(9/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)))*F^a*c^7*d^3/sqrt(b*log(F)) - 231*(sqrt(pi)*(b*d^2*x + b*c*d)*b^5*c^5*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^6/((b*log(F))^(11/2)*d^6*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 5*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^5*c^4*log(F)^5/((b*log(F))^(11/2)*d^5) - 10*(b*d^2*x + b*c*d)^3*b^3*c^3*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(11/2)*d^8*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 10*b^4*c^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(11/2)*d^5) - b^3*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(11/2)*d^5) - 5*(b*d^2*x + b*c*d)^5*b*c*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(11/2)*d^10*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)))*F^a*c^6*d^4/sqrt(b*log(F)) + 231*(sqrt(pi)*(b*d^2*x + b*c*d)*b^6*c^6*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^7/((b*log(F))^(13/2)*d^7*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 6*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^6*c^5*log(F)^6/((b*log(F))^(13/2)*d^6) - 15*(b*d^2*x + b*c*d)^3*b^4*c^4*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 20*b^5*c^3*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(13/2)*d^6) - 6*b^4*c*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(13/2)*d^6) - 15*(b*d^2*x + b*c*d)^5*b^2*c^2*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^11*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) - (b*d^2*x + b*c*d)^7*gamma(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^13*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)))*F^a*c^5*d^5/sqrt(b*log(F)) - 165*(sqrt(pi)*(b*d^2*x + b*c*d)*b^7*c^7*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^8/((b*log(F))^(15/2)*d^8*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 7*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^7*c^6*log(F)^7/((b*log(F))^(15/2)*d^7) - 21*(b*d^2*x + b*c*d)^3*b^5*c^5*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(15/2)*d^10*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 35*b^6*c^4*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(15/2)*d^7) - 21*b^5*c^2*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(15/2)*d^7) - 35*(b*d^2*x + b*c*d)^5*b^3*c^3*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(15/2)*d^12*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2

```
)) + b^4*gamma(4, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))
^(15/2)*d^7) - 7*(b*d^2*x + b*c*d)^7*b*c*gamma(7/2, -(b*d^2*x + b*c*d)^2*lo
g(F)/(b*d^2))*log(F)^8/((b*log(F))^(15/2)*d^14*(-(b*d^2*x + b*c*d)^2*log(F)
/(b*d^2))^(7/2)))*F^a*c^4*d^6/sqrt(b*log(F)) + 165/2*(sqrt(pi)*(b*d^2*x + b
*c*d)*b^8*c^8*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^9
/((b*log(F))^(17/2)*d^9*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 8*F^((
b*d^2*x + b*c*d)^2/(b*d^2))*b^8*c^7*log(F)^8/((b*log(F))^(17/2)*d^8) - 28*(
b*d^2*x + b*c*d)^3*b^6*c^6*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*
log(F)^9/((b*log(F))^(17/2)*d^11*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2
)) + 56*b^7*c^5*gamma(2, -(b*d^2*x + b*c*d)^2*l...
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 468 vs. $2(102) = 204$.
time = 0.40, size = 468, normalized size = 4.46

$$\frac{\left((b^5d^{10}x^{10}+10b^5cd^9x^9+45b^5c^2d^8x^8+120b^5c^3d^7x^7+210b^5c^4d^6x^6+252b^5c^5d^5x^5+210b^5c^6d^4x^4+120b^5c^7d^3x^3+45b^5c^8d^2x^2+10b^5c^9dx+b^5c^{10})\log(F)^5-5(b^4d^8x^8+8b^4cd^7x^7+28b^4c^2d^6x^6+56b^4c^3d^5x^5+70b^4c^4d^4x^4+56b^4c^5d^3x^3+28b^4c^6d^2x^2+8b^4c^7dx+b^4c^8)\log(F)^4+20(b^3d^6x^6+6b^3cd^5x^5+15b^3c^2d^4x^4+20b^3c^3d^3x^3+15b^3c^4d^2x^2+6b^3c^5dx+b^3c^6)\log(F)^3-60(b^2d^4x^4+4b^2cd^3x^3+6b^2c^2d^2x^2+4b^2c^3dx+b^2c^4)\log(F)^2+120(bd^2x^2+2bcdx+bc^2)\log(F)-120\right)F^{bd^2x^2+2bcdx+bc^2+a}}{2b^6d\log(F)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^11,x, algorithm="fricas")
```

```
[Out] 1/2*((b^5*d^10*x^10 + 10*b^5*c*d^9*x^9 + 45*b^5*c^2*d^8*x^8 + 120*b^5*c^3*d
^7*x^7 + 210*b^5*c^4*d^6*x^6 + 252*b^5*c^5*d^5*x^5 + 210*b^5*c^6*d^4*x^4 +
120*b^5*c^7*d^3*x^3 + 45*b^5*c^8*d^2*x^2 + 10*b^5*c^9*d*x + b^5*c^10)*log(F
)^5 - 5*(b^4*d^8*x^8 + 8*b^4*c*d^7*x^7 + 28*b^4*c^2*d^6*x^6 + 56*b^4*c^3*d^
5*x^5 + 70*b^4*c^4*d^4*x^4 + 56*b^4*c^5*d^3*x^3 + 28*b^4*c^6*d^2*x^2 + 8*b^
4*c^7*d*x + b^4*c^8)*log(F)^4 + 20*(b^3*d^6*x^6 + 6*b^3*c*d^5*x^5 + 15*b^3*
c^2*d^4*x^4 + 20*b^3*c^3*d^3*x^3 + 15*b^3*c^4*d^2*x^2 + 6*b^3*c^5*d*x + b^3
*c^6)*log(F)^3 - 60*(b^2*d^4*x^4 + 4*b^2*c*d^3*x^3 + 6*b^2*c^2*d^2*x^2 + 4*
b^2*c^3*d*x + b^2*c^4)*log(F)^2 + 120*(b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F
) - 120)*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)/(b^6*d*log(F)^6)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 794 vs. $2(105) = 210$.
time = 0.31, size = 794, normalized size = 7.56

$$\begin{cases} \frac{F^{a+b(c+dx)^2}\left(b^5c^{10}\log(F)^5+10b^5c^9dx\log(F)^5+45b^5c^8d^2x^2\log(F)^5+120b^5c^7d^3x^3\log(F)^5+210b^5c^6d^4x^4\log(F)^5+252b^5c^5d^5x^5\log(F)^5+210b^5c^4d^6x^6\log(F)^5+120b^5c^3d^7x^7\log(F)^5+45b^5c^2d^8x^8\log(F)^5+10b^5cd^9x^9\log(F)^5+b^5d^{10}x^{10}\log(F)^5-5b^4c^8\log(F)^4-40b^4c^7dx\log(F)^4-140b^4c^6d^2x^2\log(F)^4-280b^4c^5d^3x^3\log(F)^4-350b^4c^4d^4x^4\log(F)^4-280b^4c^3d^5x^5\log(F)^4-140b^4c^2d^6x^6\log(F)^4-40b^4cd^7x^7\log(F)^4-5b^4d^8x^8\log(F)^4+20b^3c^6\log(F)^3+120b^3c^5dx\log(F)^3+300b^3c^4d^2x^2\log(F)^3+400b^3c^3d^3x^3\log(F)^3+300b^3c^2d^4x^4\log(F)^3+120b^3cd^5x^5\log(F)^3+20b^3d^6x^6\log(F)^3-60b^2c^4\log(F)^2-240b^2c^3dx\log(F)^2-360b^2c^2d^2x^2\log(F)^2-240b^2cd^3x^3\log(F)^2-60b^2d^4x^4\log(F)^2+120bc^2\log(F)+240bcdx\log(F)+120bd^2x^2\log(F)-120\right)}{2b^6d\log(F)^6} & \text{for } b^6d\log(F)^6 \neq 0 \\ c^{11}x+\frac{11c^{10}dx^2}{2}+\frac{55c^9d^2x^3}{3}+\frac{165c^8d^3x^4}{4}+66c^7d^4x^5+77c^6d^5x^6+66c^5d^6x^7+\frac{165c^4d^7x^8}{4}+\frac{55c^3d^8x^9}{3}+\frac{11c^2d^9x^{10}}{2}+cd^{10}x^{11}+\frac{d^{11}x^{12}}{12} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c)**11,x)
```

```
[Out] Piecewise((F**(a + b*(c + d*x)**2)*(b**5*c**10*log(F)**5 + 10*b**5*c**9*d*x
*log(F)**5 + 45*b**5*c**8*d**2*x**2*log(F)**5 + 120*b**5*c**7*d**3*x**3*log
(F)**5 + 210*b**5*c**6*d**4*x**4*log(F)**5 + 252*b**5*c**5*d**5*x**5*log(F)
**5 + 210*b**5*c**4*d**6*x**6*log(F)**5 + 120*b**5*c**3*d**7*x**7*log(F)**5
 + 45*b**5*c**2*d**8*x**8*log(F)**5 + 10*b**5*c*d**9*x**9*log(F)**5 + b**5*
d**10*x**10*log(F)**5 - 5*b**4*c**8*log(F)**4 - 40*b**4*c**7*d*x*log(F)**4
```

```
- 140*b**4*c**6*d**2*x**2*log(F)**4 - 280*b**4*c**5*d**3*x**3*log(F)**4 - 3
50*b**4*c**4*d**4*x**4*log(F)**4 - 280*b**4*c**3*d**5*x**5*log(F)**4 - 140*
b**4*c**2*d**6*x**6*log(F)**4 - 40*b**4*c*d**7*x**7*log(F)**4 - 5*b**4*d**8
*x**8*log(F)**4 + 20*b**3*c**6*log(F)**3 + 120*b**3*c**5*d*x*log(F)**3 + 30
0*b**3*c**4*d**2*x**2*log(F)**3 + 400*b**3*c**3*d**3*x**3*log(F)**3 + 300*b
**3*c**2*d**4*x**4*log(F)**3 + 120*b**3*c*d**5*x**5*log(F)**3 + 20*b**3*d**
6*x**6*log(F)**3 - 60*b**2*c**4*log(F)**2 - 240*b**2*c**3*d*x*log(F)**2 - 3
60*b**2*c**2*d**2*x**2*log(F)**2 - 240*b**2*c*d**3*x**3*log(F)**2 - 60*b**2
*d**4*x**4*log(F)**2 + 120*b*c**2*log(F) + 240*b*c*d*x*log(F) + 120*b*d**2*
x**2*log(F) - 120)/(2*b**6*d*log(F)**6), Ne(b**6*d*log(F)**6, 0)), (c**11*x
 + 11*c**10*d*x**2/2 + 55*c**9*d**2*x**3/3 + 165*c**8*d**3*x**4/4 + 66*c**7
*d**4*x**5 + 77*c**6*d**5*x**6 + 66*c**5*d**6*x**7 + 165*c**4*d**7*x**8/4 +
 55*c**3*d**8*x**9/3 + 11*c**2*d**9*x**10/2 + c*d**10*x**11 + d**11*x**12/1
2, True))
```

Giac [**A**]
time = 2.69, size = 145, normalized size = 1.38

$$\frac{\left(b^5d^{10}\left(x+\frac{c}{d}\right)^{10}\log\left(F\right)^5-5\,b^4d^8\left(x+\frac{c}{d}\right)^8\log\left(F\right)^4+20\,b^3d^6\left(x+\frac{c}{d}\right)^6\log\left(F\right)^3-60\,b^2d^4\left(x+\frac{c}{d}\right)^4\log\left(F\right)^2+120\,bd^2\left(x+\frac{c}{d}\right)^2\log\left(F\right)-120\right)e^{\left(bd^2x^2\log\left(F\right)+2\,bcdx\log\left(F\right)+bc^2\log\left(F\right)+a\log\left(F\right)\right)}}{2\,b^6d\log\left(F\right)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^11,x, algorithm="giac")
```

```
[Out] 1/2*(b^5*d^10*(x + c/d)^10*log(F)^5 - 5*b^4*d^8*(x + c/d)^8*log(F)^4 + 20*b
^3*d^6*(x + c/d)^6*log(F)^3 - 60*b^2*d^4*(x + c/d)^4*log(F)^2 + 120*b*d^2*(
x + c/d)^2*log(F) - 120)*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^2*log
(F) + a*log(F))/(b^6*d*log(F)^6)
```

Mupad [**B**]
time = 4.15, size = 553, normalized size = 5.27

$$\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,\left(c^{10}+10\,c^9\,d\,x+45\,c^8\,d^2\,x^2+120\,c^7\,d^3\,x^3+210\,c^6\,d^4\,x^4+252\,c^5\,d^5\,x^5+210\,c^4\,d^6\,x^6+120\,c^3\,d^7\,x^7+45\,c^2\,d^8\,x^8+10\,c\,d^9\,x^9+d^{10}\,x^{10}\right)}{2\,b\,d\,\ln\left(F\right)}-\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,\left(5\,c^8+40\,c^7\,d\,x+140\,c^6\,d^2\,x^2+280\,c^5\,d^3\,x^3+350\,c^4\,d^4\,x^4+280\,c^3\,d^5\,x^5+140\,c^2\,d^6\,x^6+40\,c\,d^7\,x^7+5\,d^8\,x^8\right)}{2\,b^2\,d\,{\ln\left(F\right)}^2}-\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,\left(60\,c^4+240\,c^3\,d\,x+360\,c^2\,d^2\,x^2+240\,c\,d^3\,x^3+60\,d^4\,x^4\right)}{2\,b^4\,d\,{\ln\left(F\right)}^4}-\frac{60\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}}{b^6\,d\,{\ln\left(F\right)}^6}+\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,\left(20\,c^6+120\,c^5\,d\,x+300\,c^4\,d^2\,x^2+400\,c^3\,d^3\,x^3+300\,c^2\,d^4\,x^4+120\,c\,d^5\,x^5+20\,d^6\,x^6\right)}{2\,b^3\,d\,{\ln\left(F\right)}^3}+\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,\left(120\,c^2+240\,c\,d\,x+120\,d^2\,x^2\right)}{2\,b^5\,d\,{\ln\left(F\right)}^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x)^11,x)
```

```
[Out] (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*(c^10 + d^10*x^10 + 10*c*d^9*x^9
 + 45*c^8*d^2*x^2 + 120*c^7*d^3*x^3 + 210*c^6*d^4*x^4 + 252*c^5*d^5*x^5 + 2
10*c^4*d^6*x^6 + 120*c^3*d^7*x^7 + 45*c^2*d^8*x^8 + 10*c^9*d*x))/(2*b*d*log
(F)) - (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*(5*c^8 + 5*d^8*x^8 + 40*c
*d^7*x^7 + 140*c^6*d^2*x^2 + 280*c^5*d^3*x^3 + 350*c^4*d^4*x^4 + 280*c^3*d^
5*x^5 + 140*c^2*d^6*x^6 + 40*c^7*d*x))/(2*b^2*d*log(F)^2) - (F^(b*d^2*x^2)*
F^a*F^(b*c^2)*F^(2*b*c*d*x)*(60*c^4 + 60*d^4*x^4 + 240*c*d^3*x^3 + 360*c^2*
d^2*x^2 + 240*c^3*d*x))/(2*b^4*d*log(F)^4) - (60*F^(b*d^2*x^2)*F^a*F^(b*c^2
)*F^(2*b*c*d*x))/(b^6*d*log(F)^6) + (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d
```

```
*x)*(20*c^6 + 20*d^6*x^6 + 120*c*d^5*x^5 + 300*c^4*d^2*x^2 + 400*c^3*d^3*x^
3 + 300*c^2*d^4*x^4 + 120*c^5*d*x))/(2*b^3*d*log(F)^3) + (F^(b*d^2*x^2)*F^a
*F^(b*c^2)*F^(2*b*c*d*x)*(120*c^2 + 120*d^2*x^2 + 240*c*d*x))/(2*b^5*d*log(
F)^5)
```

3.256 $\int F^{a+b(c+dx)^2}(c+dx)^9\,dx$

Optimal. Leaf size=88

$$\frac{F^{a+b(c+dx)^2}\left(24-24b(c+dx)^2\log(F)+12b^2(c+dx)^4\log^2(F)-4b^3(c+dx)^6\log^3(F)+b^4(c+dx)^8\log^4(F)\right)}{2b^5d\log^5(F)}$$

```
[Out] 1/2*F^(a+b*(d*x+c)^2)*(24-24*b*(d*x+c)^2*ln(F)+12*b^2*(d*x+c)^4*ln(F)^2-4*b
^3*(d*x+c)^6*ln(F)^3+b^4*(d*x+c)^8*ln(F)^4)/b^5/d/ln(F)^5
```

Rubi [A]
time = 0.08, antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2249}

$$\frac{F^{a+b(c+dx)^2}\left(b^4\log^4(F)(c+dx)^8-4b^3\log^3(F)(c+dx)^6+12b^2\log^2(F)(c+dx)^4-24b\log(F)(c+dx)^2+24\right)}{2b^5d\log^5(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x)^9,x]
```

```
[Out] (F^(a + b*(c + d*x)^2)*(24 - 24*b*(c + d*x)^2*Log[F] + 12*b^2*(c + d*x)^4*L
og[F]^2 - 4*b^3*(c + d*x)^6*Log[F]^3 + b^4*(c + d*x)^8*Log[F]^4))/(2*b^5*d*
Log[F]^5)
```

Rule 2249

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> With[{p = Simplify[(m + 1)/n]}, Simp[(-F^a)*((f/d)^m/(d*n*
((-b)*Log[F])^p))*Simplify[FunctionExpand[Gamma[p, (-b)*(c + d*x)^n*Log[F]]
]], x] /; IGtQ[p, 0]] /; FreeQ[{F, a, b, c, d, e, f, m, n}, x] && EqQ[d*e -
 c*f, 0] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)^9\,dx=\frac{F^a\Gamma(5,-b(c+dx)^2\log(F))}{2b^5d\log^5(F)}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.24, size = 31, normalized size = 0.35

$$\frac{F^a\Gamma(5,-b(c+dx)^2\log(F))}{2b^5d\log^5(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x)^9,x]
```

```
[Out] (F^a*Gamma[5, -(b*(c + d*x)^2*Log[F])])/(2*b^5*d*Log[F]^5)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 395 vs. $2(86) = 172$.
time = 0.09, size = 396, normalized size = 4.50

method	result
gosper	$\left(24-24\ln(F)b\,c^{2}-24\ln(F)b\,d^{2}x^{2}-48\ln(F)bcdx+28\ln(F)^{4}b^{4}c^{6}d^{2}x^{2}+8\ln(F)^{4}b^{4}c^{7}dx-24c\,d^{5}x^{5}b^{3}\ln(F)^{3}-60\ln(F)^{3}b^{3}c^{2}d^{4}x^{4}-80\ln($
risch	$\left(24-24\ln(F)b\,c^{2}-24\ln(F)b\,d^{2}x^{2}-48\ln(F)bcdx+28\ln(F)^{4}b^{4}c^{6}d^{2}x^{2}+8\ln(F)^{4}b^{4}c^{7}dx-24c\,d^{5}x^{5}b^{3}\ln(F)^{3}-60\ln(F)^{3}b^{3}c^{2}d^{4}x^{4}-80\ln($
norman	$\frac{d^{3}\left(35\ln(F)^{2}b^{2}c^{4}-30\ln(F)b\,c^{2}+6\right)x^{4}\mathrm{e}^{\left(a+b(dx+c)^{2}\right)\ln(F)}}{\ln(F)^{3}b^{3}}+\frac{\left(\ln(F)^{4}b^{4}c^{8}-4\ln(F)^{3}b^{3}c^{6}+12\ln(F)^{2}b^{2}c^{4}-24\ln(F)b\,c^{2}+24\right)\mathrm{e}^{\left(a+b(dx\right.}}{2b^{5}\ln(F)^{5}d}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)*(d*x+c)^9,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*(24-24*ln(F)*b*c^2-24*ln(F)*b*d^2*x^2-48*ln(F)*b*c*d*x+28*ln(F)^4*b^4*c
^6*d^2*x^2+8*ln(F)^4*b^4*c^7*d*x-24*c*d^5*x^5*b^3*ln(F)^3-60*ln(F)^3*b^3*c^
2*d^4*x^4-80*ln(F)^3*b^3*c^3*d^3*x^3-60*ln(F)^3*b^3*c^4*d^2*x^2-24*ln(F)^3*
b^3*c^5*d*x+48*d^3*c*x^3*b^2*ln(F)^2+72*ln(F)^2*b^2*c^2*d^2*x^2+48*ln(F)^2*
b^2*c^3*d*x+ln(F)^4*b^4*c^8+12*ln(F)^2*b^2*c^4-4*ln(F)^3*b^3*c^6+12*d^4*x^4
*b^2*ln(F)^2+d^8*x^8*b^4*ln(F)^4-4*d^6*x^6*b^3*ln(F)^3+8*c*d^7*x^7*b^4*ln(F
)^4+28*ln(F)^4*b^4*c^2*d^6*x^6+56*ln(F)^4*b^4*c^3*d^5*x^5+70*ln(F)^4*b^4*c^
4*d^4*x^4+56*ln(F)^4*b^4*c^5*d^3*x^3)*F^(b*d^2*x^2+2*b*c*d*x+b*c^2+a)/b^5/l
n(F)^5/d
```

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 1.32, size = 3727, normalized size = 42.35

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^9,x, algorithm="maxima")
```

```
[Out] -9/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log
(F)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*
d))*F^a*c^8/sqrt(b*log(F)) + 18*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(erf(sq
rt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2)*d^
3*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2/(b*
```

```
d^2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma(3/2
, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(-(b*
d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*c^7*d/sqrt(b*log(F)) - 42*(sqr
t(pi)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^
2))) - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(
b*d^2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/((b*log(F))^(
7/2)*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d
^2))^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^2/((
b*log(F))^(7/2)*d^3))*F^a*c^6*d^2/sqrt(b*log(F)) + 63*(sqrt(pi)*(b*d^2*x +
b*c*d)*b^4*c^4*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^
5/((b*log(F))^(9/2)*d^5*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 4*F^((
b*d^2*x + b*c*d)^2/(b*d^2))*b^4*c^3*log(F)^4/((b*log(F))^(9/2)*d^4) - 6*(b*
d^2*x + b*c*d)^3*b^2*c^2*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*lo
g(F)^5/((b*log(F))^(9/2)*d^7*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) +
 4*b^3*c*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))
^(9/2)*d^4) - (b*d^2*x + b*c*d)^5*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))*log(F)^5/((b*log(F))^(9/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))
^(5/2)))*F^a*c^5*d^3/sqrt(b*log(F)) - 63*(sqrt(pi)*(b*d^2*x + b*c*d)*b^5*c^
5*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^6/((b*log(F))
^(11/2)*d^6*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 5*F^((b*d^2*x + b*
c*d)^2/(b*d^2))*b^5*c^4*log(F)^5/((b*log(F))^(11/2)*d^5) - 10*(b*d^2*x + b*
c*d)^3*b^3*c^3*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b
*log(F))^(11/2)*d^8*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 10*b^4*c
^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(11/2
)*d^5) - b^3*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log
(F))^(11/2)*d^5) - 5*(b*d^2*x + b*c*d)^5*b*c*gamma(5/2, -(b*d^2*x + b*c*d)^
2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(11/2)*d^10*(-(b*d^2*x + b*c*d)^2*lo
g(F)/(b*d^2))^(5/2)))*F^a*c^4*d^4/sqrt(b*log(F)) + 42*(sqrt(pi)*(b*d^2*x +
b*c*d)*b^6*c^6*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^
7/((b*log(F))^(13/2)*d^7*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 6*F^(
(b*d^2*x + b*c*d)^2/(b*d^2))*b^6*c^5*log(F)^6/((b*log(F))^(13/2)*d^6) - 15*
(b*d^2*x + b*c*d)^3*b^4*c^4*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))
*log(F)^7/((b*log(F))^(13/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2
)) + 20*b^5*c^3*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*
log(F))^(13/2)*d^6) - 6*b^4*c*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))
*log(F)^4/((b*log(F))^(13/2)*d^6) - 15*(b*d^2*x + b*c*d)^5*b^2*c^2*gamma(5/
2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^11*(-
(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) - (b*d^2*x + b*c*d)^7*gamma(7/2,
 -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^13*(-(b
*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)))*F^a*c^3*d^5/sqrt(b*log(F)) - 18*(
sqrt(pi)*(b*d^2*x + b*c*d)*b^7*c^7*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))) - 1)*log(F)^8/((b*log(F))^(15/2)*d^8*sqrt(-(b*d^2*x + b*c*d)^2*log(
F)/(b*d^2))) - 7*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^7*c^6*log(F)^7/((b*log(F
))^(15/2)*d^7) - 21*(b*d^2*x + b*c*d)^3*b^5*c^5*gamma(3/2, -(b*d^2*x + b*c*
```

```
d)^2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(15/2)*d^10*(-(b*d^2*x + b*c*d)^2
*log(F)/(b*d^2))^(3/2)) + 35*b^6*c^4*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(
b*d^2))*log(F)^6/((b*log(F))^(15/2)*d^7) - 21*b^5*c^2*gamma(3, -(b*d^2*x +
b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(15/2)*d^7) - 35*(b*d^2*x + b
*c*d)^5*b^3*c^3*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^8/((
b*log(F))^(15/2)*d^12*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) + b^4*ga
mma(4, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(15/2)*d^7
) - 7*(b*d^2*x + b*c*d)^7*b*c*gamma(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2
))*log(F)^8/((b*log(F))^(15/2)*d^14*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(
7/2)))*F^a*c^2*d^6/sqrt(b*log(F)) + 9/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^8*c^8
*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^9/((b*log(F))^
(17/2)*d^9*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 8*F^((b*d^2*x + b*c
*d)^2/(b*d^2))*b^8*c^7*log(F)^8/((b*log(F))^(17/2)*d^8) - 28*(b*d^2*x + b*c
*d)^3*b^6*c^6*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^9/((b*
log(F))^(17/2)*d^11*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 56*b^7*c
^5*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2)...
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 324 vs. $2(86) = 172$.
time = 0.38, size = 324, normalized size = 3.68

$$\frac{\left(\left(b^4d^8x^8+8\,b^4cd^7x^7+28\,b^4c^2d^6x^6+56\,b^4c^3d^5x^5+70\,b^4c^4d^4x^4+56\,b^4c^5d^3x^3+28\,b^4c^6d^2x^2+8\,b^4c^7dx+b^4c^8\right)\log\left(F\right)^4-4\left(b^3d^6x^6+6\,b^3cd^5x^5+15\,b^3c^2d^4x^4+20\,b^3c^3d^3x^3+15\,b^3c^4d^2x^2+6\,b^3c^5dx+b^3c^6\right)\log\left(F\right)^3+12\left(b^2d^4x^4+4\,b^2cd^3x^3+6\,b^2c^2d^2x^2+4\,b^2c^3dx+b^2c^4\right)\log\left(F\right)^2-24\left(bd^2x^2+2\,bcdx+bc^2\right)\log\left(F\right)+24\right)F^{bd^2x^2+2\,bcdx+bc^2+a}}{2\,b^5d\log\left(F\right)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^9,x, algorithm="fricas")
```

```
[Out] 1/2*((b^4*d^8*x^8 + 8*b^4*c*d^7*x^7 + 28*b^4*c^2*d^6*x^6 + 56*b^4*c^3*d^5*x
^5 + 70*b^4*c^4*d^4*x^4 + 56*b^4*c^5*d^3*x^3 + 28*b^4*c^6*d^2*x^2 + 8*b^4*c
^7*d*x + b^4*c^8)*log(F)^4 - 4*(b^3*d^6*x^6 + 6*b^3*c*d^5*x^5 + 15*b^3*c^2*
d^4*x^4 + 20*b^3*c^3*d^3*x^3 + 15*b^3*c^4*d^2*x^2 + 6*b^3*c^5*d*x + b^3*c^6
)*log(F)^3 + 12*(b^2*d^4*x^4 + 4*b^2*c*d^3*x^3 + 6*b^2*c^2*d^2*x^2 + 4*b^2*
c^3*d*x + b^2*c^4)*log(F)^2 - 24*(b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F) + 2
4)*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)/(b^5*d*log(F)^5)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 556 vs. $2(87) = 174$.
time = 0.20, size = 556, normalized size = 6.32

$$\begin{cases} \frac{F^{a+b(c+dx)^2}\left(b^4c^8\log\left(F\right)^4+8b^4c^7dx\log\left(F\right)^4+28b^4c^6d^2x^2\log\left(F\right)^4+56b^4c^5d^3x^3\log\left(F\right)^4+70b^4c^4d^4x^4\log\left(F\right)^4+56b^4c^3d^5x^5\log\left(F\right)^4+28b^4c^2d^6x^6\log\left(F\right)^4+8b^4cd^7x^7\log\left(F\right)^4+b^4d^8x^8\log\left(F\right)^4-4b^3c^6\log\left(F\right)^3-24b^3c^5dx\log\left(F\right)^3-60b^3c^4d^2x^2\log\left(F\right)^3-80b^3c^3d^3x^3\log\left(F\right)^3-60b^3c^2d^4x^4\log\left(F\right)^3-24b^3cd^5x^5\log\left(F\right)^3-4b^3d^6x^6\log\left(F\right)^3+12b^2c^4\log\left(F\right)^2+48b^2c^3dx\log\left(F\right)^2+72b^2c^2d^2x^2\log\left(F\right)^2+48b^2cd^3x^3\log\left(F\right)^2+12b^2d^4x^4\log\left(F\right)^2-24bc^2\log\left(F\right)-48bcdx\log\left(F\right)-24bd^2x^2\log\left(F\right)+24\right)}{2b^5d\log\left(F\right)^5} & \text{for}\: b^5d\log\left(F\right)^5 \neq 0 \\ c^9x+\frac{9c^8dx^2}{2}+12c^7d^2x^3+21c^6d^3x^4+\frac{126c^5d^4x^5}{5}+21c^4d^5x^6+12c^3d^6x^7+\frac{9c^2d^7x^8}{2}+cd^8x^9+\frac{d^9x^{10}}{10} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c)**9,x)
```

```
[Out] Piecewise((F**(a + b*(c + d*x)**2)*(b**4*c**8*log(F)**4 + 8*b**4*c**7*d*x*l
og(F)**4 + 28*b**4*c**6*d**2*x**2*log(F)**4 + 56*b**4*c**5*d**3*x**3*log(F)
**4 + 70*b**4*c**4*d**4*x**4*log(F)**4 + 56*b**4*c**3*d**5*x**5*log(F)**4 +
```

```
28*b**4*c**2*d**6*x**6*log(F)**4 + 8*b**4*c*d**7*x**7*log(F)**4 + b**4*d**
8*x**8*log(F)**4 - 4*b**3*c**6*log(F)**3 - 24*b**3*c**5*d*x*log(F)**3 - 60*
b**3*c**4*d**2*x**2*log(F)**3 - 80*b**3*c**3*d**3*x**3*log(F)**3 - 60*b**3*
c**2*d**4*x**4*log(F)**3 - 24*b**3*c*d**5*x**5*log(F)**3 - 4*b**3*d**6*x**6
*log(F)**3 + 12*b**2*c**4*log(F)**2 + 48*b**2*c**3*d*x*log(F)**2 + 72*b**2*
c**2*d**2*x**2*log(F)**2 + 48*b**2*c*d**3*x**3*log(F)**2 + 12*b**2*d**4*x**
4*log(F)**2 - 24*b*c**2*log(F) - 48*b*c*d*x*log(F) - 24*b*d**2*x**2*log(F)
+ 24)/(2*b**5*d*log(F)**5), Ne(b**5*d*log(F)**5, 0)), (c**9*x + 9*c**8*d*x*
*2/2 + 12*c**7*d**2*x**3 + 21*c**6*d**3*x**4 + 126*c**5*d**4*x**5/5 + 21*c*
*4*d**5*x**6 + 12*c**3*d**6*x**7 + 9*c**2*d**7*x**8/2 + c*d**8*x**9 + d**9*
x**10/10, True))
```

Giac [A]
time = 2.60, size = 124, normalized size = 1.41

$$\frac{\left(b^4d^8\left(x+\frac{c}{d}\right)^8\log\left(F\right)^4-4\,b^3d^6\left(x+\frac{c}{d}\right)^6\log\left(F\right)^3+12\,b^2d^4\left(x+\frac{c}{d}\right)^4\log\left(F\right)^2-24\,bd^2\left(x+\frac{c}{d}\right)^2\log\left(F\right)+24\right)e^{\left(bd^2x^2\log(F)+2\,bcdx\log(F)+bc^2\log(F)+a\log(F)\right)}}{2\,b^5d\log\left(F\right)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^9,x, algorithm="giac")
```

```
[Out] 1/2*(b^4*d^8*(x + c/d)^8*log(F)^4 - 4*b^3*d^6*(x + c/d)^6*log(F)^3 + 12*b^2
*d^4*(x + c/d)^4*log(F)^2 - 24*b*d^2*(x + c/d)^2*log(F) + 24)*e^(b*d^2*x^2*
log(F) + 2*b*c*d*x*log(F) + b*c^2*log(F) + a*log(F))/(b^5*d*log(F)^5)
```

Mupad [B]
time = 3.94, size = 391, normalized size = 4.44

$$\frac{12\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}-\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,b^3\,\ln(F)^3\,\left(4\,c^6+24\,c^5\,d\,x+60\,c^4\,d^2\,x^2+80\,c^3\,d^3\,x^3+60\,c^2\,d^4\,x^4+24\,c\,d^5\,x^5+4\,d^6\,x^6\right)}{2}+\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,b^4\,\ln(F)^4\,\left(c^8+8\,c^7\,d\,x+28\,c^6\,d^2\,x^2+56\,c^5\,d^3\,x^3+70\,c^4\,d^4\,x^4+56\,c^3\,d^5\,x^5+28\,c^2\,d^6\,x^6+8\,c\,d^7\,x^7+d^8\,x^8\right)}{2}-\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,b\,\ln(F)\,\left(24\,c^2+48\,c\,d\,x+24\,d^2\,x^2\right)}{2}+\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,b^2\,\ln(F)^2\,\left(12\,c^4+48\,c^3\,d\,x+72\,c^2\,d^2\,x^2+48\,c\,d^3\,x^3+12\,d^4\,x^4\right)}{2}}{b^5\,d\,\ln\left(F\right)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x)^9,x)
```

```
[Out] (12*F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x) - (F^(b*d^2*x^2)*F^a*F^(b*c^2
)*F^(2*b*c*d*x)*b^3*log(F)^3*(4*c^6 + 4*d^6*x^6 + 24*c*d^5*x^5 + 60*c^4*d^2
*x^2 + 80*c^3*d^3*x^3 + 60*c^2*d^4*x^4 + 24*c^5*d*x))/2 + (F^(b*d^2*x^2)*F^
a*F^(b*c^2)*F^(2*b*c*d*x)*b^4*log(F)^4*(c^8 + d^8*x^8 + 8*c*d^7*x^7 + 28*c^
6*d^2*x^2 + 56*c^5*d^3*x^3 + 70*c^4*d^4*x^4 + 56*c^3*d^5*x^5 + 28*c^2*d^6*x
^6 + 8*c^7*d*x))/2 - (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*b*log(F)*(2
4*c^2 + 24*d^2*x^2 + 48*c*d*x))/2 + (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d
*x)*b^2*log(F)^2*(12*c^4 + 12*d^4*x^4 + 48*c*d^3*x^3 + 72*c^2*d^2*x^2 + 48*
c^3*d*x))/2)/(b^5*d*log(F)^5)
```

3.257 $\int F^{a+b(c+dx)^2}(c+dx)^7\,dx$

Optimal. Leaf size=126

$$-\frac{3F^{a+b(c+dx)^2}}{b^4d\log^4(F)}+\frac{3F^{a+b(c+dx)^2}(c+dx)^2}{b^3d\log^3(F)}-\frac{3F^{a+b(c+dx)^2}(c+dx)^4}{2b^2d\log^2(F)}+\frac{F^{a+b(c+dx)^2}(c+dx)^6}{2bd\log(F)}$$

```
[Out] -3*F^(a+b*(d*x+c)^2)/b^4/d/ln(F)^4+3*F^(a+b*(d*x+c)^2)*(d*x+c)^2/b^3/d/ln(F
)^3-3/2*F^(a+b*(d*x+c)^2)*(d*x+c)^4/b^2/d/ln(F)^2+1/2*F^(a+b*(d*x+c)^2)*(d*
x+c)^6/b/d/ln(F)
```

Rubi [A]
time = 0.18, antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2243, 2240}

$$-\frac{3F^{a+b(c+dx)^2}}{b^4d\log^4(F)}+\frac{3(c+dx)^2F^{a+b(c+dx)^2}}{b^3d\log^3(F)}-\frac{3(c+dx)^4F^{a+b(c+dx)^2}}{2b^2d\log^2(F)}+\frac{(c+dx)^6F^{a+b(c+dx)^2}}{2bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x)^7,x]
```

```
[Out] (-3*F^(a + b*(c + d*x)^2))/(b^4*d*Log[F]^4) + (3*F^(a + b*(c + d*x)^2)*(c +
 d*x)^2)/(b^3*d*Log[F]^3) - (3*F^(a + b*(c + d*x)^2)*(c + d*x)^4)/(2*b^2*d*
Log[F]^2) + (F^(a + b*(c + d*x)^2)*(c + d*x)^6)/(2*b*d*Log[F])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)^7\,dx = \frac{F^{a+b(c+dx)^2}(c+dx)^6}{2bd\log(F)} - \frac{3\int F^{a+b(c+dx)^2}(c+dx)^5\,dx}{b\log(F)}$$

$$= -\frac{3F^{a+b(c+dx)^2}(c+dx)^4}{2b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^2}(c+dx)^6}{2bd\log(F)} + \frac{6\int F^{a+b(c+dx)^2}(c+dx)^3\,dx}{b^2\log^2(F)}$$

$$= \frac{3F^{a+b(c+dx)^2}(c+dx)^2}{b^3d\log^3(F)} - \frac{3F^{a+b(c+dx)^2}(c+dx)^4}{2b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^2}(c+dx)^6}{2bd\log(F)} - \frac{6\int F}{}$$

$$= -\frac{3F^{a+b(c+dx)^2}}{b^4d\log^4(F)} + \frac{3F^{a+b(c+dx)^2}(c+dx)^2}{b^3d\log^3(F)} - \frac{3F^{a+b(c+dx)^2}(c+dx)^4}{2b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^2}}{2bd\log}$$

Mathematica [**A**]
time = 0.21, size = 72, normalized size = 0.57

$$\frac{F^{a+b(c+dx)^2}\left(-6+6b(c+dx)^2\log(F)-3b^2(c+dx)^4\log^2(F)+b^3(c+dx)^6\log^3(F)\right)}{2b^4d\log^4(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x)^7,x]
```

```
[Out] (F^(a + b*(c + d*x)^2)*(-6 + 6*b*(c + d*x)^2*Log[F] - 3*b^2*(c + d*x)^4*Log
[F]^2 + b^3*(c + d*x)^6*Log[F]^3))/(2*b^4*d*Log[F]^4)
```

Maple [**B**] Leaf count of result is larger than twice the leaf count of optimal. 248 vs. 2(122) = 244.
time = 0.09, size = 249, normalized size = 1.98

method	result
gosper	$\frac{\left(d^6x^6b^3\ln(F)^3+6cd^5x^5b^3\ln(F)^3+15\ln(F)^3b^3c^2d^4x^4+20\ln(F)^3b^3c^3d^3x^3+15\ln(F)^3b^3c^4d^2x^2+6\ln(F)^3b^3c^5dx+\ln(F)^3b^3c^6-3d^4x\right.}{}$
risch	$\frac{\left(d^6x^6b^3\ln(F)^3+6cd^5x^5b^3\ln(F)^3+15\ln(F)^3b^3c^2d^4x^4+20\ln(F)^3b^3c^3d^3x^3+15\ln(F)^3b^3c^4d^2x^2+6\ln(F)^3b^3c^5dx+\ln(F)^3b^3c^6-3d^4x\right.}{}$
norman	$\frac{\left(\ln(F)^3b^3c^6-3\ln(F)^2b^2c^4+6\ln(F)bc^2-6\right)e^{\left(a+b(dx+c)^2\right)\ln(F)}}{2\ln(F)^4b^4d}+\frac{d^5x^6e^{\left(a+b(dx+c)^2\right)\ln(F)}}{2\ln(F)b}+\frac{3c\left(\ln(F)^2b^2c^4-2\ln(F)bc^2+2\right)xe}{\ln(F)^3b^3}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)*(d*x+c)^7,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*(d^6*x^6*b^3*ln(F)^3+6*c*d^5*x^5*b^3*ln(F)^3+15*ln(F)^3*b^3*c^2*d^4*x^4
+20*ln(F)^3*b^3*c^3*d^3*x^3+15*ln(F)^3*b^3*c^4*d^2*x^2+6*ln(F)^3*b^3*c^5*d*
x+ln(F)^3*b^3*c^6-3*d^4*x^4*b^2*ln(F)^2-12*d^3*c*x^3*b^2*ln(F)^2-18*ln(F)^2
*b^2*c^2*d^2*x^2-12*ln(F)^2*b^2*c^3*d*x-3*ln(F)^2*b^2*c^4+6*ln(F)*b*d^2*x^2
```

```
+12*ln(F)*b*c*d*x+6*ln(F)*b*c^2-6)*F^(b*d^2*x^2+2*b*c*d*x+b*c^2+a)/ln(F)^4/
b^4/d
```

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 0.99, size = 2452, normalized size = 19.46

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -7/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log
(F)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*
d))*F^a*c^6/sqrt(b*log(F)) + 21/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(erf(
sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2)*
d^3*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2/(
b*d^2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma(3
/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(-(
b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*c^5*d/sqrt(b*log(F)) - 35/2*
(sqrt(pi)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(
b*d^2))) - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d)^2*log(
F)/(b*d^2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/((b*log(F
))^(7/2)*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*c*d)^2*l
og(F)/(b*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^
2/((b*log(F))^(7/2)*d^3))*F^a*c^4*d^2/sqrt(b*log(F)) + 35/2*(sqrt(pi)*(b*d^
2*x + b*c*d)*b^4*c^4*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*l
og(F)^5/((b*log(F))^(9/2)*d^5*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) -
4*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^4*c^3*log(F)^4/((b*log(F))^(9/2)*d^4) -
 6*(b*d^2*x + b*c*d)^3*b^2*c^2*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^
2))*log(F)^5/((b*log(F))^(9/2)*d^7*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3
/2)) + 4*b^3*c*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*l
og(F))^(9/2)*d^4) - (b*d^2*x + b*c*d)^5*gamma(5/2, -(b*d^2*x + b*c*d)^2*log
(F)/(b*d^2))*log(F)^5/((b*log(F))^(9/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))^(5/2)))*F^a*c^3*d^3/sqrt(b*log(F)) - 21/2*(sqrt(pi)*(b*d^2*x + b*c*d
)*b^5*c^5*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^6/((b
*log(F))^(11/2)*d^6*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 5*F^((b*d^
2*x + b*c*d)^2/(b*d^2))*b^5*c^4*log(F)^5/((b*log(F))^(11/2)*d^5) - 10*(b*d^
2*x + b*c*d)^3*b^3*c^3*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(
F)^6/((b*log(F))^(11/2)*d^8*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) +
10*b^4*c^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F
))^(11/2)*d^5) - b^3*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3
/((b*log(F))^(11/2)*d^5) - 5*(b*d^2*x + b*c*d)^5*b*c*gamma(5/2, -(b*d^2*x +
 b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(11/2)*d^10*(-(b*d^2*x + b*c
```

```
*d)^2*log(F)/(b*d^2))^(5/2)))*F^a*c^2*d^4/sqrt(b*log(F)) + 7/2*(sqrt(pi)*(b
*d^2*x + b*c*d)*b^6*c^6*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1
)*log(F)^7/((b*log(F))^(13/2)*d^7*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))
) - 6*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^6*c^5*log(F)^6/((b*log(F))^(13/2)*d
^6) - 15*(b*d^2*x + b*c*d)^3*b^4*c^4*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)
/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d
^2))^(3/2)) + 20*b^5*c^3*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(
F)^5/((b*log(F))^(13/2)*d^6) - 6*b^4*c*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)
/(b*d^2))*log(F)^4/((b*log(F))^(13/2)*d^6) - 15*(b*d^2*x + b*c*d)^5*b^2*c^2
*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2
)*d^11*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) - (b*d^2*x + b*c*d)^7*g
amma(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*
d^13*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)))*F^a*c*d^5/sqrt(b*log(F))
 - 1/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^7*c^7*(erf(sqrt(-(b*d^2*x + b*c*d)^2*l
og(F)/(b*d^2))) - 1)*log(F)^8/((b*log(F))^(15/2)*d^8*sqrt(-(b*d^2*x + b*c*d
)^2*log(F)/(b*d^2))) - 7*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^7*c^6*log(F)^7/(
(b*log(F))^(15/2)*d^7) - 21*(b*d^2*x + b*c*d)^3*b^5*c^5*gamma(3/2, -(b*d^2*
x + b*c*d)^2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(15/2)*d^10*(-(b*d^2*x +
b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 35*b^6*c^4*gamma(2, -(b*d^2*x + b*c*d)^2*
log(F)/(b*d^2))*log(F)^6/((b*log(F))^(15/2)*d^7) - 21*b^5*c^2*gamma(3, -(b*
d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(15/2)*d^7) - 35*(b*d
^2*x + b*c*d)^5*b^3*c^3*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log
(F)^8/((b*log(F))^(15/2)*d^12*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2))
+ b^4*gamma(4, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(1
5/2)*d^7) - 7*(b*d^2*x + b*c*d)^7*b*c*gamma(7/2, -(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))*log(F)^8/((b*log(F))^(15/2)*d^14*(-(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))^(7/2)))*F^a*d^6/sqrt(b*log(F)) + 1/2*sqrt(pi)*F^(b*c^2 + a)*c^7*erf(
sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt(-b*log(F)))/(sqrt(-b*log(F))*F^(b*c^2
)*d)
```

Fricas [**A**]
time = 0.38, size = 208, normalized size = 1.65

$$\frac{\left(\left(b^3d^6x^6+6\,b^3cd^5x^5+15\,b^3c^2d^4x^4+20\,b^3c^3d^3x^3+15\,b^3c^4d^2x^2+6\,b^3c^5dx+b^3c^6\right)\log\left(F\right)^3-3\left(b^2d^4x^4+4\,b^2cd^3x^3+6\,b^2c^2d^2x^2+4\,b^2c^3dx+b^2c^4\right)\log\left(F\right)^2+6\left(bd^2x^2+2\,bcdx+bc^2\right)\log\left(F\right)-6\right)F^{bd^2x^2+2\,bcdx+bc^2+a}}{2\,b^4d\log\left(F\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*((b^3*d^6*x^6 + 6*b^3*c*d^5*x^5 + 15*b^3*c^2*d^4*x^4 + 20*b^3*c^3*d^3*x
^3 + 15*b^3*c^4*d^2*x^2 + 6*b^3*c^5*d*x + b^3*c^6)*log(F)^3 - 3*(b^2*d^4*x^
4 + 4*b^2*c*d^3*x^3 + 6*b^2*c^2*d^2*x^2 + 4*b^2*c^3*d*x + b^2*c^4)*log(F)^2
 + 6*(b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F) - 6)*F^(b*d^2*x^2 + 2*b*c*d*x +
 b*c^2 + a)/(b^4*d*log(F)^4)
```

Sympy [**B**] Leaf count of result is larger than twice the leaf count of optimal. 364 vs. $2(112) = 224$.

time = 0.14, size = 364, normalized size = 2.89

$$\begin{cases} \frac{F^{a+b(c+dx)^2}\left(b^3c^6\log(F)^3+6b^3c^5dx\log(F)^3+15b^3c^4d^2x^2\log(F)^3+20b^3c^3d^3x^3\log(F)^3+15b^3c^2d^4x^4\log(F)^3+6b^3cd^5x^5\log(F)^3+b^3d^6x^6\log(F)^3-3b^2c^4\log(F)^2-12b^2c^3dx\log(F)^2-18b^2c^2d^2x^2\log(F)^2-12b^2cd^3x^3\log(F)^2-3b^2d^4x^4\log(F)^2+6bc^2\log(F)+12bcdx\log(F)+6bd^2x^2\log(F)-6\right)}{2b^4d\log(F)^4} & \text{for } b^4d\log(F)^4 \neq 0 \\ c^7x+\frac{7c^6dx^2}{2}+7c^5d^2x^3+\frac{35c^4d^3x^4}{4}+7c^3d^4x^5+\frac{7c^2d^5x^6}{2}+cd^6x^7+\frac{d^7x^8}{8} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c)**7,x)
```

```
[Out] Piecewise((F**(a + b*(c + d*x)**2)*(b**3*c**6*log(F)**3 + 6*b**3*c**5*d*x*l
og(F)**3 + 15*b**3*c**4*d**2*x**2*log(F)**3 + 20*b**3*c**3*d**3*x**3*log(F)
**3 + 15*b**3*c**2*d**4*x**4*log(F)**3 + 6*b**3*c*d**5*x**5*log(F)**3 + b**
3*d**6*x**6*log(F)**3 - 3*b**2*c**4*log(F)**2 - 12*b**2*c**3*d*x*log(F)**2
- 18*b**2*c**2*d**2*x**2*log(F)**2 - 12*b**2*c*d**3*x**3*log(F)**2 - 3*b**2
*d**4*x**4*log(F)**2 + 6*b*c**2*log(F) + 12*b*c*d*x*log(F) + 6*b*d**2*x**2*
log(F) - 6)/(2*b**4*d*log(F)**4), Ne(b**4*d*log(F)**4, 0)), (c**7*x + 7*c**
6*d*x**2/2 + 7*c**5*d**2*x**3 + 35*c**4*d**3*x**4/4 + 7*c**3*d**4*x**5 + 7*
c**2*d**5*x**6/2 + c*d**6*x**7 + d**7*x**8/8, True))
```

Giac [A]
time = 2.64, size = 103, normalized size = 0.82

$$\frac{\left(b^3d^6\left(x+\frac{c}{d}\right)^6\log(F)^3-3\,b^2d^4\left(x+\frac{c}{d}\right)^4\log(F)^2+6\,bd^2\left(x+\frac{c}{d}\right)^2\log(F)-6\right)e^{\left(bd^2x^2\log(F)+2\,bcdx\log(F)+bc^2\log(F)+a\log(F)\right)}}{2\,b^4d\log(F)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*(b^3*d^6*(x + c/d)^6*log(F)^3 - 3*b^2*d^4*(x + c/d)^4*log(F)^2 + 6*b*d^
2*(x + c/d)^2*log(F) - 6)*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^2*lo
g(F) + a*log(F))/(b^4*d*log(F)^4)
```

Mupad [B]
time = 3.82, size = 253, normalized size = 2.01

$$\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,\left(b^3\,c^6\ln(F)^3+6\,b^3\,c^5\,d\,x\ln(F)^3+15\,b^3\,c^4\,d^2\,x^2\ln(F)^3+20\,b^3\,c^3\,d^3\,x^3\ln(F)^3+15\,b^3\,c^2\,d^4\,x^4\ln(F)^3+6\,b^3\,c\,d^5\,x^5\ln(F)^3+b^3\,d^6\,x^6\ln(F)^3-3\,b^2\,c^4\ln(F)^2-12\,b^2\,c^3\,d\,x\ln(F)^2-18\,b^2\,c^2\,d^2\,x^2\ln(F)^2-12\,b^2\,c\,d^3\,x^3\ln(F)^2-3\,b^2\,d^4\,x^4\ln(F)^2+6\,b\,c^2\ln(F)+12\,b\,c\,d\,x\ln(F)+6\,b\,d^2\,x^2\ln(F)-6\right)}{2\,b^4\,d\ln(F)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x)^7,x)
```

```
[Out] (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*(6*b*c^2*log(F) - 3*b^2*c^4*log(
F)^2 + b^3*c^6*log(F)^3 + 6*b*d^2*x^2*log(F) - 3*b^2*d^4*x^4*log(F)^2 + b^3
*d^6*x^6*log(F)^3 - 12*b^2*c*d^3*x^3*log(F)^2 + 6*b^3*c*d^5*x^5*log(F)^3 -
18*b^2*c^2*d^2*x^2*log(F)^2 + 15*b^3*c^4*d^2*x^2*log(F)^3 + 20*b^3*c^3*d^3*
x^3*log(F)^3 + 15*b^3*c^2*d^4*x^4*log(F)^3 + 12*b*c*d*x*log(F) - 12*b^2*c^3
*d*x*log(F)^2 + 6*b^3*c^5*d*x*log(F)^3 - 6))/(2*b^4*d*log(F)^4)
```

3.258 $\int F^{a+b(c+dx)^2}(c+dx)^5\,dx$

Optimal. Leaf size=91

$$\frac{F^{a+b(c+dx)^2}}{b^3d\log^3(F)}-\frac{F^{a+b(c+dx)^2}(c+dx)^2}{b^2d\log^2(F)}+\frac{F^{a+b(c+dx)^2}(c+dx)^4}{2bd\log(F)}$$

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

Rubi [A]
time = 0.13, antiderivative size = 91, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2243, 2240}

$$\frac{F^{a+b(c+dx)^2}}{b^3d\log^3(F)}-\frac{(c+dx)^2F^{a+b(c+dx)^2}}{b^2d\log^2(F)}+\frac{(c+dx)^4F^{a+b(c+dx)^2}}{2bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x)^5,x]
```

```
[Out] F^(a + b*(c + d*x)^2)/(b^3*d*Log[F]^3) - (F^(a + b*(c + d*x)^2)*(c + d*x)^2
)/(b^2*d*Log[F]^2) + (F^(a + b*(c + d*x)^2)*(c + d*x)^4)/(2*b*d*Log[F])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)^5\,dx = \frac{F^{a+b(c+dx)^2}(c+dx)^4}{2bd\log(F)} - \frac{2\int F^{a+b(c+dx)^2}(c+dx)^3\,dx}{b\log(F)}$$
$$= -\frac{F^{a+b(c+dx)^2}(c+dx)^2}{b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^2}(c+dx)^4}{2bd\log(F)} + \frac{2\int F^{a+b(c+dx)^2}(c+dx)\,dx}{b^2\log^2(F)}$$
$$= \frac{F^{a+b(c+dx)^2}}{b^3d\log^3(F)} - \frac{F^{a+b(c+dx)^2}(c+dx)^2}{b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^2}(c+dx)^4}{2bd\log(F)}$$

Mathematica [A]
time = 0.18, size = 56, normalized size = 0.62

$$\frac{F^{a+b(c+dx)^2}\left(2-2b(c+dx)^2\log(F)+b^2(c+dx)^4\log^2(F)\right)}{2b^3d\log^3(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x)^5,x]
```

```
[Out] (F^(a + b*(c + d*x)^2)*(2 - 2*b*(c + d*x)^2*Log[F] + b^2*(c + d*x)^4*Log[F]
^2))/(2*b^3*d*Log[F]^3)
```

Maple [A]
time = 0.09, size = 138, normalized size = 1.52

method	result
gosper	$\frac{\left(d^4x^4b^2\ln(F)^2+4d^3cx^3b^2\ln(F)^2+6\ln(F)^2b^2c^2d^2x^2+4\ln(F)^2b^2c^3dx+\ln(F)^2b^2c^4-2\ln(F)bd^2x^2-4\ln(F)bcdx-2\ln(F)bc^2+2\right)F^{b\,d^2}}{2\ln(F)^3b^3d}$
risch	$\frac{\left(d^4x^4b^2\ln(F)^2+4d^3cx^3b^2\ln(F)^2+6\ln(F)^2b^2c^2d^2x^2+4\ln(F)^2b^2c^3dx+\ln(F)^2b^2c^4-2\ln(F)bd^2x^2-4\ln(F)bcdx-2\ln(F)bc^2+2\right)F^{b\,d^2}}{2\ln(F)^3b^3d}$
norman	$\frac{d(3\ln(F)bc^2-1)x^2e^{\left(a+b(dx+c)^2\right)\ln(F)}}{\ln(F)^2b^2}+\frac{\left(\ln(F)^2b^2c^4-2\ln(F)bc^2+2\right)e^{\left(a+b(dx+c)^2\right)\ln(F)}}{2\ln(F)^3b^3d}+\frac{d^3x^4e^{\left(a+b(dx+c)^2\right)\ln(F)}}{2\ln(F)b}+\frac{2c(\ln(}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)*(d*x+c)^5,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*(d^4*x^4*b^2*ln(F)^2+4*d^3*c*x^3*b^2*ln(F)^2+6*ln(F)^2*b^2*c^2*d^2*x^2+
4*ln(F)^2*b^2*c^3*d*x+ln(F)^2*b^2*c^4-2*ln(F)*b*d^2*x^2-4*ln(F)*b*c*d*x-2*l
n(F)*b*c^2+2)*F^(b*d^2*x^2+2*b*c*d*x+b*c^2+a)/ln(F)^3/b^3/d
```

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 0.74, size = 1438, normalized size = 15.80

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -5/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log
(F)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*
d))*F^a*c^4/sqrt(b*log(F)) + 5*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(erf(sqr
t(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2)*d^3
*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2/(b*d
^2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma(3/2,
 -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(-(b*d
^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*c^3*d/sqrt(b*log(F)) - 5*(sqrt(
pi)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2)
)) - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*
d^2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/((b*log(F))^(7/
2)*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2
))^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^2/((b*
log(F))^(7/2)*d^3))*F^a*c^2*d^2/sqrt(b*log(F)) + 5/2*(sqrt(pi)*(b*d^2*x + b
*c*d)*b^4*c^4*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^5
/((b*log(F))^(9/2)*d^5*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 4*F^((b
*d^2*x + b*c*d)^2/(b*d^2))*b^4*c^3*log(F)^4/((b*log(F))^(9/2)*d^4) - 6*(b*d
^2*x + b*c*d)^3*b^2*c^2*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log
(F)^5/((b*log(F))^(9/2)*d^7*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) +
4*b^3*c*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^
(9/2)*d^4) - (b*d^2*x + b*c*d)^5*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*
d^2))*log(F)^5/((b*log(F))^(9/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^
(5/2)))*F^a*c*d^3/sqrt(b*log(F)) - 1/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^5*c^5*
(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^6/((b*log(F))^(
11/2)*d^6*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 5*F^((b*d^2*x + b*c*
d)^2/(b*d^2))*b^5*c^4*log(F)^5/((b*log(F))^(11/2)*d^5) - 10*(b*d^2*x + b*c*
d)^3*b^3*c^3*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*l
og(F))^(11/2)*d^8*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 10*b^4*c^2
*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(11/2)*
d^5) - b^3*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F
))^(11/2)*d^5) - 5*(b*d^2*x + b*c*d)^5*b*c*gamma(5/2, -(b*d^2*x + b*c*d)^2*
log(F)/(b*d^2))*log(F)^6/((b*log(F))^(11/2)*d^10*(-(b*d^2*x + b*c*d)^2*log(
F)/(b*d^2))^(5/2)))*F^a*d^4/sqrt(b*log(F)) + 1/2*sqrt(pi)*F^(b*c^2 + a)*c^5
*erf(sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt(-b*log(F)))/(sqrt(-b*log(F))*F^(
b*c^2)*d)
```

Fricas [A]
time = 0.38, size = 120, normalized size = 1.32

$$\frac{\left((b^2d^4x^4+4\,b^2cd^3x^3+6\,b^2c^2d^2x^2+4\,b^2c^3dx+b^2c^4)\log\left(F\right)^2-2\,(bd^2x^2+2\,bcdx+bc^2)\log\left(F\right)+2\right)F^{bd^2x^2+2\,bcdx+bc^2+a}}{2\,b^3d\log\left(F\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*((b^2*d^4*x^4 + 4*b^2*c*d^3*x^3 + 6*b^2*c^2*d^2*x^2 + 4*b^2*c^3*d*x + b
^2*c^4)*log(F)^2 - 2*(b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F) + 2)*F^(b*d^2*x
^2 + 2*b*c*d*x + b*c^2 + a)/(b^3*d*log(F)^3)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 212 vs. $2(76) = 152$.
time = 0.17, size = 212, normalized size = 2.33

$$\begin{cases} \frac{F^{a+b(c+dx)^2}\left(b^2c^4\log(F)^2+4b^2c^3dx\log(F)^2+6b^2c^2d^2x^2\log(F)^2+4b^2cd^3x^3\log(F)^2+b^2d^4x^4\log(F)^2-2bc^2\log(F)-4bcdx\log(F)-2bd^2x^2\log(F)+2\right)}{2b^3d\log(F)^3} & \text{for } b^3d\log(F)^3\neq 0 \\ c^5x+\frac{5c^4dx^2}{2}+\frac{10c^3d^2x^3}{3}+\frac{5c^2d^3x^4}{2}+cd^4x^5+\frac{d^5x^6}{6} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c)**5,x)
```

```
[Out] Piecewise((F**(a + b*(c + d*x)**2)*(b**2*c**4*log(F)**2 + 4*b**2*c**3*d*x*l
og(F)**2 + 6*b**2*c**2*d**2*x**2*log(F)**2 + 4*b**2*c*d**3*x**3*log(F)**2 +
 b**2*d**4*x**4*log(F)**2 - 2*b*c**2*log(F) - 4*b*c*d*x*log(F) - 2*b*d**2*x
**2*log(F) + 2)/(2*b**3*d*log(F)**3), Ne(b**3*d*log(F)**3, 0)), (c**5*x + 5
*c**4*d*x**2/2 + 10*c**3*d**2*x**3/3 + 5*c**2*d**3*x**4/2 + c*d**4*x**5 + d
**5*x**6/6, True))
```

Giac [A]
time = 2.94, size = 82, normalized size = 0.90

$$\frac{\left(b^2d^4\left(x+\frac{c}{d}\right)^4\log(F)^2-2\,bd^2\left(x+\frac{c}{d}\right)^2\log(F)+2\right)e^{\left(bd^2x^2\log(F)+2\,bcdx\log(F)+bc^2\log(F)+a\log(F)\right)}}{2\,b^3d\log(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*(b^2*d^4*(x + c/d)^4*log(F)^2 - 2*b*d^2*(x + c/d)^2*log(F) + 2)*e^(b*d^
2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^2*log(F) + a*log(F))/(b^3*d*log(F)^3)
```

Mupad [B]
time = 3.66, size = 142, normalized size = 1.56

$$\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,\left(b^2\,c^4\,\ln(F)^2+4\,b^2\,c^3\,d\,x\,\ln(F)^2+6\,b^2\,c^2\,d^2\,x^2\,\ln(F)^2+4\,b^2\,c\,d^3\,x^3\,\ln(F)^2+b^2\,d^4\,x^4\,\ln(F)^2-2\,b\,c^2\,\ln(F)-4\,b\,c\,d\,x\,\ln(F)-2\,b\,d^2\,x^2\,\ln(F)+2\right)}{2\,b^3\,d\,\ln(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x)^5,x)
```

```
[Out] (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*(b^2*c^4*log(F)^2 - 2*b*c^2*log(
F) - 2*b*d^2*x^2*log(F) + b^2*d^4*x^4*log(F)^2 + 4*b^2*c*d^3*x^3*log(F)^2 +
 6*b^2*c^2*d^2*x^2*log(F)^2 - 4*b*c*d*x*log(F) + 4*b^2*c^3*d*x*log(F)^2 + 2
))/(2*b^3*d*log(F)^3)
```

3.259 $\int F^{a+b(c+dx)^2}(c+dx)^3\,dx$

Optimal. Leaf size=62

$$-\frac{F^{a+b(c+dx)^2}}{2b^2d\log^2(F)}+\frac{F^{a+b(c+dx)^2}(c+dx)^2}{2bd\log(F)}$$

```
[Out] -1/2*F^(a+b*(d*x+c)^2)/b^2/d/ln(F)^2+1/2*F^(a+b*(d*x+c)^2)*(d*x+c)^2/b/d/ln
(F)
```

Rubi [A]

time = 0.07, antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2243, 2240}

$$\frac{(c+dx)^2F^{a+b(c+dx)^2}}{2bd\log(F)}-\frac{F^{a+b(c+dx)^2}}{2b^2d\log^2(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x)^3,x]
```

```
[Out] -1/2*F^(a + b*(c + d*x)^2)/(b^2*d*Log[F]^2) + (F^(a + b*(c + d*x)^2)*(c + d
*x)^2)/(2*b*d*Log[F])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\begin{aligned}\int F^{a+b(c+dx)^2}(c+dx)^3\,dx&=\frac{F^{a+b(c+dx)^2}(c+dx)^2}{2bd\log(F)}-\frac{\int F^{a+b(c+dx)^2}(c+dx)\,dx}{b\log(F)}\\&=-\frac{F^{a+b(c+dx)^2}}{2b^2d\log^2(F)}+\frac{F^{a+b(c+dx)^2}(c+dx)^2}{2bd\log(F)}\end{aligned}$$

Mathematica [A]
time = 0.15, size = 40, normalized size = 0.65

$$\frac{F^{a+b(c+dx)^2}(-1+b(c+dx)^2\log(F))}{2b^2d\log^2(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x)^3,x]
```

```
[Out] (F^(a + b*(c + d*x)^2)*(-1 + b*(c + d*x)^2*Log[F]))/(2*b^2*d*Log[F]^2)
```

Maple [A]
time = 0.08, size = 63, normalized size = 1.02

method	result	size
gosper	$\frac{\left(\ln(F) b\, d^{2} x^{2}+2 \ln(F) b c d x+\ln(F) b\, c^{2}-1\right) F^{b\, d^{2} x^{2}+2 b c d x+b\, c^{2}+a}}{2 \ln(F)^{2} b^{2} d}$	63
risch	$\frac{\left(\ln(F) b\, d^{2} x^{2}+2 \ln(F) b c d x+\ln(F) b\, c^{2}-1\right) F^{b\, d^{2} x^{2}+2 b c d x+b\, c^{2}+a}}{2 \ln(F)^{2} b^{2} d}$	63
norman	$\frac{c x\, \mathrm{e}^{\left(a+b(d x+c)^{2}\right) \ln(F)}}{\ln(F) b}+\frac{\left(\ln(F) b\, c^{2}-1\right) \mathrm{e}^{\left(a+b(d x+c)^{2}\right) \ln(F)}}{2 \ln(F)^{2} b^{2} d}+\frac{d\, x^{2} \mathrm{e}^{\left(a+b(d x+c)^{2}\right) \ln(F)}}{2 \ln(F) b}$	91

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)*(d*x+c)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*(ln(F)*b*d^2*x^2+2*ln(F)*b*c*d*x+ln(F)*b*c^2-1)*F^(b*d^2*x^2+2*b*c*d*x+
b*c^2+a)/ln(F)^2/b^2/d
```

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 0.52, size = 683, normalized size = 11.02

$$-\frac{3\left(\frac{\sqrt{\pi}(bd^2x+bcd)bc\left(\operatorname{erf}\left(\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}\right)-1\right)\log(F)^2}{(b\log(F))^{\frac{3}{2}}d^2\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}}-\frac{F^{\frac{(bd^2x+bcd)^2}{bd^2}}b\log(F)}{(b\log(F))^{\frac{3}{2}}d}\right)F^ac^2}{2\sqrt{b\log(F)}}+\frac{3\left(\frac{\sqrt{\pi}(bd^2x+bcd)b^2c^2\left(\operatorname{erf}\left(\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}\right)-1\right)\log(F)^3}{(b\log(F))^{\frac{5}{2}}d^3\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}}-\frac{2F^{\frac{(bd^2x+bcd)^2}{bd^2}}b^2c\log(F)^2}{(b\log(F))^{\frac{5}{2}}d^2}-\frac{(bd^2x+bcd)^3\Gamma\left(\frac{3}{2},-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)\log(F)^3}{(b\log(F))^{\frac{5}{2}}d^5\left(-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)^{\frac{3}{2}}}\right)F^acd}{2\sqrt{b\log(F)}}-\frac{\left(\frac{\sqrt{\pi}(bd^2x+bcd)b^3c^3\left(\operatorname{erf}\left(\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}\right)-1\right)\log(F)^4}{(b\log(F))^{\frac{7}{2}}d^4\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}}-\frac{3F^{\frac{(bd^2x+bcd)^2}{bd^2}}b^3c^2\log(F)^3}{(b\log(F))^{\frac{7}{2}}d^3}-\frac{3(bd^2x+bcd)^3bc\Gamma\left(\frac{3}{2},-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)\log(F)^4}{(b\log(F))^{\frac{7}{2}}d^6\left(-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)^{\frac{3}{2}}}+\frac{b^2\Gamma\left(2,-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)\log(F)^2}{(b\log(F))^{\frac{7}{2}}d^3}\right)F^ad^2}{2\sqrt{b\log(F)}}+\frac{\sqrt{\pi}F^{bc^2+a}c^3\operatorname{erf}\left(\sqrt{-b\log(F)}dx-\frac{bc\log(F)}{\sqrt{-b\log(F)}}\right)}{2\sqrt{-b\log(F)}F^{bc^2}d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -3/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log
(F)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*
d))*F^a*c^2/sqrt(b*log(F)) + 3/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(erf(s
qrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2)*d
^3*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2/(b
*d^2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma(3/
2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(-(b
```

```
*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*c*d/sqrt(b*log(F)) - 1/2*(sqr
t(pi)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^
2))) - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(
b*d^2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/((b*log(F))^(
7/2)*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d
^2))^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^2/((
b*log(F))^(7/2)*d^3))*F^a*d^2/sqrt(b*log(F)) + 1/2*sqrt(pi)*F^(b*c^2 + a)*c
^3*erf(sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt(-b*log(F)))/(sqrt(-b*log(F))*F
^(b*c^2)*d)
```

Fricas [**A**]
time = 0.36, size = 60, normalized size = 0.97

$$\frac{((bd^2x^2 + 2\,bcdx + bc^2)\log(F) - 1)F^{bd^2x^2+2\,bcdx+bc^2+a}}{2\,b^2d\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*((b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F) - 1)*F^(b*d^2*x^2 + 2*b*c*d*x +
 b*c^2 + a)/(b^2*d*log(F)^2)
```

Sympy [**B**] Leaf count of result is larger than twice the leaf count of optimal. 99 vs. 2(49) = 98.
time = 0.07, size = 99, normalized size = 1.60

$$\begin{cases} \frac{F^{a+b(c+dx)^2}(bc^2\log(F)+2bcdx\log(F)+bd^2x^2\log(F)-1)}{2b^2d\log(F)^2} & \text{for } b^2d\log(F)^2 \neq 0 \\ c^3x + \frac{3c^2dx^2}{2} + cd^2x^3 + \frac{d^3x^4}{4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c)**3,x)
```

```
[Out] Piecewise((F**(a + b*(c + d*x)**2)*(b*c**2*log(F) + 2*b*c*d*x*log(F) + b*d*
*2*x**2*log(F) - 1)/(2*b**2*d*log(F)**2), Ne(b**2*d*log(F)**2, 0)), (c**3*x
 + 3*c**2*d*x**2/2 + c*d**2*x**3 + d**3*x**4/4, True))
```

Giac [**C**] Result contains complex when optimal does not.
time = 3.19, size = 1227, normalized size = 19.79

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*(2*((pi*b^2*d^2*log(abs(F))*sgn(F) - pi*b^2*d^2*log(abs(F)))*(pi*b*c^2*
d*sgn(F) + pi*(d*x^2 + 2*c*x)*b*d^2*sgn(F) - pi*b*c^2*d - pi*(d*x^2 + 2*c*x
)*b*d^2)/((pi^2*b^2*d^2*sgn(F) - pi^2*b^2*d^2 + 2*b^2*d^2*log(abs(F))^2)^2
+ 4*(pi*b^2*d^2*log(abs(F))*sgn(F) - pi*b^2*d^2*log(abs(F)))^2) + (pi^2*b^2
*d^2*sgn(F) - pi^2*b^2*d^2 + 2*b^2*d^2*log(abs(F))^2)*(b*c^2*d*log(abs(F))
+ (d*x^2 + 2*c*x)*b*d^2*log(abs(F)) - d)/((pi^2*b^2*d^2*sgn(F) - pi^2*b^2*d
^2 + 2*b^2*d^2*log(abs(F))^2)^2 + 4*(pi*b^2*d^2*log(abs(F))*sgn(F) - pi*b^2
*d^2*log(abs(F)))^2))*cos(-1/2*pi*b*d^2*x^2*sgn(F) + 1/2*pi*b*d^2*x^2 - pi*
b*c*d*x*sgn(F) + pi*b*c*d*x - 1/2*pi*b*c^2*sgn(F) + 1/2*pi*b*c^2 - 1/2*pi*a
*sgn(F) + 1/2*pi*a) + ((pi^2*b^2*d^2*sgn(F) - pi^2*b^2*d^2 + 2*b^2*d^2*log(
abs(F))^2)*(pi*b*c^2*d*sgn(F) + pi*(d*x^2 + 2*c*x)*b*d^2*sgn(F) - pi*b*c^2*
d - pi*(d*x^2 + 2*c*x)*b*d^2)/((pi^2*b^2*d^2*sgn(F) - pi^2*b^2*d^2 + 2*b^2*
d^2*log(abs(F))^2)^2 + 4*(pi*b^2*d^2*log(abs(F))*sgn(F) - pi*b^2*d^2*log(ab
s(F)))^2) - 4*(pi*b^2*d^2*log(abs(F))*sgn(F) - pi*b^2*d^2*log(abs(F)))*(b*c
^2*d*log(abs(F)) + (d*x^2 + 2*c*x)*b*d^2*log(abs(F)) - d)/((pi^2*b^2*d^2*sg
n(F) - pi^2*b^2*d^2 + 2*b^2*d^2*log(abs(F))^2)^2 + 4*(pi*b^2*d^2*log(abs(F)
)*sgn(F) - pi*b^2*d^2*log(abs(F)))^2))*sin(-1/2*pi*b*d^2*x^2*sgn(F) + 1/2*p
i*b*d^2*x^2 - pi*b*c*d*x*sgn(F) + pi*b*c*d*x - 1/2*pi*b*c^2*sgn(F) + 1/2*pi
*b*c^2 - 1/2*pi*a*sgn(F) + 1/2*pi*a))*e^(b*c^2*log(abs(F)) + (d*x^2 + 2*c*x
)*b*d*log(abs(F)) + a*log(abs(F))) - 1/4*I*((pi*b*c^2*d*sgn(F) + pi*(d*x^2
+ 2*c*x)*b*d^2*sgn(F) - pi*b*c^2*d - pi*(d*x^2 + 2*c*x)*b*d^2 - 2*I*b*c^2*d
*log(abs(F)) + 2*(-I*d*x^2 - 2*I*c*x)*b*d^2*log(abs(F)) + 2*I*d)*e^(1/2*I*p
i*b*d^2*x^2*sgn(F) - 1/2*I*pi*b*d^2*x^2 + I*pi*b*c*d*x*sgn(F) - I*pi*b*c*d*
x + 1/2*I*pi*b*c^2*sgn(F) - 1/2*I*pi*b*c^2 + 1/2*I*pi*a*sgn(F) - 1/2*I*pi*a
)/(pi^2*b^2*d^2*sgn(F) + 2*I*pi*b^2*d^2*log(abs(F))*sgn(F) - pi^2*b^2*d^2 -
 2*I*pi*b^2*d^2*log(abs(F)) + 2*b^2*d^2*log(abs(F))^2) + (pi*b*c^2*d*sgn(F)
 + pi*(d*x^2 + 2*c*x)*b*d^2*sgn(F) - pi*b*c^2*d - pi*(d*x^2 + 2*c*x)*b*d^2
+ 2*I*b*c^2*d*log(abs(F)) - 2*(-I*d*x^2 - 2*I*c*x)*b*d^2*log(abs(F)) - 2*I*
d)*e^(-1/2*I*pi*b*d^2*x^2*sgn(F) + 1/2*I*pi*b*d^2*x^2 - I*pi*b*c*d*x*sgn(F)
 + I*pi*b*c*d*x - 1/2*I*pi*b*c^2*sgn(F) + 1/2*I*pi*b*c^2 - 1/2*I*pi*a*sgn(F
) + 1/2*I*pi*a)/(pi^2*b^2*d^2*sgn(F) - 2*I*pi*b^2*d^2*log(abs(F))*sgn(F) -
pi^2*b^2*d^2 + 2*I*pi*b^2*d^2*log(abs(F)) + 2*b^2*d^2*log(abs(F))^2))*e^(b*
c^2*log(abs(F)) + (d*x^2 + 2*c*x)*b*d*log(abs(F)) + a*log(abs(F)))
```

Mupad [B]
time = 3.55, size = 67, normalized size = 1.08

$$\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,\left(b\,\ln\left(F\right)\,c^2+2\,b\,\ln\left(F\right)\,c\,d\,x+b\,\ln\left(F\right)\,d^2\,x^2-1\right)}{2\,b^2\,d\,{\ln\left(F\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x)^3,x)
```

```
[Out] (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*(b*c^2*log(F) + b*d^2*x^2*log(F)
 + 2*b*c*d*x*log(F) - 1))/(2*b^2*d*log(F)^2)
```

3.260 $\int F^{a+b(c+dx)^2}(c+dx)\,dx$

Optimal. Leaf size=27

$$\frac{F^{a+b(c+dx)^2}}{2bd\log(F)}$$

```
[Out] 1/2*F^(a+b*(d*x+c)^2)/b/d/ln(F)
```

Rubi [A]
time = 0.02, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.053$, Rules used = {2240}

$$\frac{F^{a+b(c+dx)^2}}{2bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x),x]
```

```
[Out] F^(a + b*(c + d*x)^2)/(2*b*d*Log[F])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)\,dx = \frac{F^{a+b(c+dx)^2}}{2bd\log(F)}$$

Mathematica [A]
time = 0.02, size = 27, normalized size = 1.00

$$\frac{F^{a+b(c+dx)^2}}{2bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x),x]
```

```
[Out] F^(a + b*(c + d*x)^2)/(2*b*d*Log[F])
```

Maple [A]
time = 0.01, size = 26, normalized size = 0.96

method	result	size
derivativedivides	$\frac{F^{a+b(dx+c)^{2}}}{2bd\ln(F)}$	26
default	$\frac{F^{a+b(dx+c)^{2}}}{2bd\ln(F)}$	26
norman	$\frac{\mathrm{e}^{\left(a+b(dx+c)^{2}\right)\ln(F)}}{2b\ln(F)d}$	28
gosper	$\frac{F^{b\,d^{2}x^{2}+2bcdx+b\,c^{2}+a}}{2bd\ln(F)}$	36
risch	$\frac{F^{b\,d^{2}x^{2}+2bcdx+b\,c^{2}+a}}{2bd\ln(F)}$	36

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)*(d*x+c),x,method=_RETURNVERBOSE)
[Out] 1/2*F^(a+b*(d*x+c)^2)/b/d/ln(F)
```

Maxima [A]
time = 0.28, size = 25, normalized size = 0.93

$$\frac{F^{(dx+c)^{2}b+a}}{2\,bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c),x, algorithm="maxima")
[Out] 1/2*F^((d*x + c)^2*b + a)/(b*d*log(F))
```

Fricas [A]
time = 0.37, size = 35, normalized size = 1.30

$$\frac{F^{bd^{2}x^{2}+2\,bcdx+bc^{2}+a}}{2\,bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c),x, algorithm="fricas")
[Out] 1/2*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)/(b*d*log(F))
```

Sympy [A]
time = 0.05, size = 34, normalized size = 1.26

$$\begin{cases} \frac{F^{a+b(c+dx)^{2}}}{2bd\log\left(F\right)} & \text{for}\: bd\log\left(F\right) \neq 0 \\ cx + \frac{dx^{2}}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c),x)
```

```
[Out] Piecewise((F**(a + b*(c + d*x)**2)/(2*b*d*log(F)), Ne(b*d*log(F), 0)), (c*x
 + d*x**2/2, True))
```

Giac [A]
time = 2.49, size = 35, normalized size = 1.30

$$\frac{F^{bd^2x^2+2\,bcdx+bc^2+a}}{2\,bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c),x, algorithm="giac")
```

```
[Out] 1/2*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)/(b*d*log(F))
```

Mupad [B]
time = 3.52, size = 25, normalized size = 0.93

$$\frac{F^{a+b\,{\left(c+d\,x\right)}^2}}{2\,b\,d\,\ln\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x),x)
```

```
[Out] F^(a + b*(c + d*x)^2)/(2*b*d*log(F))
```

3.261 $\int \frac{F^{a+b(c+dx)^2}}{c+dx}\,dx$

Optimal. Leaf size=22

$$\frac{F^a\text{Ei}(b(c+dx)^2\log(F))}{2d}$$

[Out] 1/2*F^a*Ei(b*(d*x+c)^2*ln(F))/d

Rubi [A]
time = 0.04, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2241}

$$\frac{F^a\text{Ei}(b(c+dx)^2\log(F))}{2d}$$

Antiderivative was successfully verified.

[In] Int[F^(a + b*(c + d*x)^2)/(c + d*x),x]

[Out] (F^a*ExpIntegralEi[b*(c + d*x)^2*Log[F]])/(2*d)

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{c+dx}\,dx = \frac{F^a\text{Ei}(b(c+dx)^2\log(F))}{2d}$$

Mathematica [A]
time = 0.17, size = 22, normalized size = 1.00

$$\frac{F^a\text{Ei}(b(c+dx)^2\log(F))}{2d}$$

Antiderivative was successfully verified.

[In] Integrate[F^(a + b*(c + d*x)^2)/(c + d*x),x]

[Out] (F^a*ExpIntegralEi[b*(c + d*x)^2*Log[F]])/(2*d)

Maple [A]
time = 0.07, size = 23, normalized size = 1.05

method	result	size
risch	$-\frac{F^{a} \operatorname{expIntegral}\left(1,-b(dx+c)^{2} \ln(F)\right)}{2d}$	23

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)/(d*x+c),x,method=_RETURNVERBOSE)
[Out] -1/2/d*F^a*Ei(1,-b*(d*x+c)^2*ln(F))
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c),x, algorithm="maxima")
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c), x)
```

Fricas [A]
time = 0.36, size = 32, normalized size = 1.45

$$\frac{F^{a}\mathrm{Ei}\left(\left(bd^{2}x^{2}+2\,bcdx+bc^{2}\right)\log\left(F\right)\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c),x, algorithm="fricas")
[Out] 1/2*F^a*Ei((b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F))/d
```

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

$$\int\frac{F^{a+b(c+dx)^{2}}}{c+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(d*x+c),x)
[Out] Integral(F**(a + b*(c + d*x)**2)/(c + d*x), x)
```

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c), x)
```

Mupad [B]
time = 3.68, size = 20, normalized size = 0.91

$$\frac{F^a\,\mathrm{ei}\left(b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^2\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(c + d*x),x)
```

```
[Out] (F^a*ei(b*log(F)*(c + d*x)^2))/(2*d)
```

3.262 $\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^3} dx$

Optimal. Leaf size=53

$$-\frac{F^{a+b(c+dx)^2}}{2d(c+dx)^2}+\frac{bF^a\text{Ei}(b(c+dx)^2\log(F))\log(F)}{2d}$$

```
[Out] -1/2*F^(a+b*(d*x+c)^2)/d/(d*x+c)^2+1/2*b*F^a*Ei(b*(d*x+c)^2*ln(F))*ln(F)/d
```

Rubi [A]
time = 0.09, antiderivative size = 53, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2245, 2241}

$$\frac{bF^a\log(F)\text{Ei}(b(c+dx)^2\log(F))}{2d}-\frac{F^{a+b(c+dx)^2}}{2d(c+dx)^2}$$

Antiderivative was successfully verified.

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

```
[Out] -1/2*F^(a + b*(c + d*x)^2)/(d*(c + d*x)^2) + (b*F^a*ExpIntegralEi[b*(c + d*
x)^2*Log[F]]*Log[F])/(2*d)
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^3}\,dx &= -\frac{F^{a+b(c+dx)^2}}{2d(c+dx)^2}+(b\log(F))\int \frac{F^{a+b(c+dx)^2}}{c+dx}\,dx\\ &= -\frac{F^{a+b(c+dx)^2}}{2d(c+dx)^2}+\frac{bF^a\text{Ei}(b(c+dx)^2\log(F))\log(F)}{2d}\end{aligned}$$

Mathematica [A]
time = 0.19, size = 47, normalized size = 0.89

$$\frac{F^a\left(-\frac{F^{b(c+dx)^2}}{(c+dx)^2}+b\text{Ei}\left(b(c+dx)^2\log(F)\right)\log(F)\right)}{2d}$$

Antiderivative was successfully verified.

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

```
[Out] (F^a*(-(F^(b*(c + d*x)^2)/(c + d*x)^2) + b*ExpIntegralEi[b*(c + d*x)^2*Log[
F]]*Log[F]))/(2*d)
```

Maple [A]
time = 0.07, size = 53, normalized size = 1.00

method	result	size
risch	$-\frac{F^{b(dx+c)^2}F^a}{2d(dx+c)^2}-\frac{b\ln(F)F^a\,\text{expIntegral}\left(1,-b(dx+c)^2\ln(F)\right)}{2d}$	53

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)/(d*x+c)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2/d/(d*x+c)^2*F^(b*(d*x+c)^2)*F^a-1/2/d*b*ln(F)*F^a*Ei(1,-b*(d*x+c)^2*ln
(F))
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 100 vs. $2(49) = 98$.
time = 0.39, size = 100, normalized size = 1.89

$$\frac{(bd^2x^2+2\,bcdx+bc^2)F^a\text{Ei}\left((bd^2x^2+2\,bcdx+bc^2)\log(F)\right)\log(F)-F^{bd^2x^2+2\,bcdx+bc^2+a}}{2\,(d^3x^2+2\,cd^2x+c^2d)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*((b*d^2*x^2 + 2*b*c*d*x + b*c^2)*F^a*Ei((b*d^2*x^2 + 2*b*c*d*x + b*c^2)
*log(F))*log(F) - F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a))/(d^3*x^2 + 2*c*d^2
*x + c^2*d)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

Mupad [B]
time = 4.68, size = 51, normalized size = 0.96

$$-\frac{F^a\,\left(F^{b\,(c+d\,x)^2}+b\,\ln\left(F\right)\,\mathrm{expint}\left(-b\,\ln\left(F\right)\,(c+d\,x)^2\right)\,(c+d\,x)^2\right)}{2\,d\,(c+d\,x)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -(F^a*(F^(b*(c + d*x)^2) + b*log(F)*expint(-b*log(F)*(c + d*x)^2)*(c + d*x)
^2))/(2*d*(c + d*x)^2)
```

3.263 $\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^5} dx$

Optimal. Leaf size=87

$$-\frac{F^{a+b(c+dx)^2}}{4d(c+dx)^4}-\frac{bF^{a+b(c+dx)^2}\log(F)}{4d(c+dx)^2}+\frac{b^2F^a\text{Ei}(b(c+dx)^2\log(F))\log^2(F)}{4d}$$

```
[Out] -1/4*F^(a+b*(d*x+c)^2)/d/(d*x+c)^4-1/4*b*F^(a+b*(d*x+c)^2)*ln(F)/d/(d*x+c)^
2+1/4*b^2*F^a*Ei(b*(d*x+c)^2*ln(F))*ln(F)^2/d
```

Rubi [A]
time = 0.13, antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2245, 2241}

$$\frac{b^2F^a\log^2(F)\text{Ei}(b(c+dx)^2\log(F))}{4d}-\frac{F^{a+b(c+dx)^2}}{4d(c+dx)^4}-\frac{b\log(F)F^{a+b(c+dx)^2}}{4d(c+dx)^2}$$

Antiderivative was successfully verified.

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

```
[Out] -1/4*F^(a + b*(c + d*x)^2)/(d*(c + d*x)^4) - (b*F^(a + b*(c + d*x)^2)*Log[F
])/(4*d*(c + d*x)^2) + (b^2*F^a*ExpIntegralEi[b*(c + d*x)^2*Log[F]]*Log[F]^
2)/(4*d)
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^5} dx = -\frac{F^{a+b(c+dx)^2}}{4d(c+dx)^4} + \frac{1}{2}(b\log(F)) \int \frac{F^{a+b(c+dx)^2}}{(c+dx)^3} dx$$
$$= -\frac{F^{a+b(c+dx)^2}}{4d(c+dx)^4} - \frac{bF^{a+b(c+dx)^2}\log(F)}{4d(c+dx)^2} + \frac{1}{2}\left(b^2\log^2(F)\right) \int \frac{F^{a+b(c+dx)^2}}{c+dx} dx$$
$$= -\frac{F^{a+b(c+dx)^2}}{4d(c+dx)^4} - \frac{bF^{a+b(c+dx)^2}\log(F)}{4d(c+dx)^2} + \frac{b^2F^a\text{Ei}(b(c+dx)^2\log(F))\log^2(F)}{4d}$$

Mathematica [A]
time = 0.21, size = 64, normalized size = 0.74

$$\frac{F^a\left(b^2\text{Ei}(b(c+dx)^2\log(F))\log^2(F) - \frac{F^{b(c+dx)^2}(1+b(c+dx)^2\log(F))}{(c+dx)^4}\right)}{4d}$$

Antiderivative was successfully verified.

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

```
[Out] (F^a*(b^2*ExpIntegralEi[b*(c + d*x)^2*Log[F]]*Log[F]^2 - (F^(b*(c + d*x)^2)
*(1 + b*(c + d*x)^2*Log[F]))/(c + d*x)^4))/(4*d)
```

Maple [A]
time = 0.08, size = 86, normalized size = 0.99

method	result	size
risch	$-\frac{F^{b(dx+c)^2}F^a}{4d(dx+c)^4} - \frac{b\ln(F)F^{b(dx+c)^2}F^a}{4d(dx+c)^2} - \frac{b^2\ln(F)^2F^a\,\text{expIntegral}\left(1,-b(dx+c)^2\ln(F)\right)}{4d}$	86

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)/(d*x+c)^5,x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/d/(d*x+c)^4*F^(b*(d*x+c)^2)*F^a-1/4/d*b*ln(F)/(d*x+c)^2*F^(b*(d*x+c)^2
)*F^a-1/4/d*b^2*ln(F)^2*F^a*Ei(1,-b*(d*x+c)^2*ln(F))
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 183 vs. $2(81) = 162$.
time = 0.39, size = 183, normalized size = 2.10

$$\frac{(b^2d^4x^4 + 4\,b^2cd^3x^3 + 6\,b^2c^2d^2x^2 + 4\,b^2c^3dx + b^2c^4)F^a\mathrm{Ei}((bd^2x^2 + 2\,bcdx + bc^2)\log(F))\log(F)^2 - ((bd^2x^2 + 2\,bcdx + bc^2)\log(F) + 1)F^{bd^2x^2+2\,bcdx+bc^2+a}}{4\,(d^5x^4 + 4\,cd^4x^3 + 6\,c^2d^3x^2 + 4\,c^3d^2x + c^4d)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*((b^2*d^4*x^4 + 4*b^2*c*d^3*x^3 + 6*b^2*c^2*d^2*x^2 + 4*b^2*c^3*d*x + b
^2*c^4)*F^a*Ei((b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F))*log(F)^2 - ((b*d^2*x
^2 + 2*b*c*d*x + b*c^2)*log(F) + 1)*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a))/
(d^5*x^4 + 4*c*d^4*x^3 + 6*c^2*d^3*x^2 + 4*c^3*d^2*x + c^4*d)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

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

Mupad [B]
time = 5.76, size = 76, normalized size = 0.87

$$-\frac{F^a\,b^2\ln(F)^2\left(\frac{\mathrm{expint}\left(-b\,\ln(F)\,(c+d\,x)^2\right)}{2}+F^{b\,(c+d\,x)^2}\left(\frac{1}{2\,b\,\ln(F)\,(c+d\,x)^2}+\frac{1}{2\,b^2\,\ln(F)^2\,(c+d\,x)^4}\right)\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -(F^a*b^2*log(F)^2*(expint(-b*log(F)*(c + d*x)^2)/2 + F^(b*(c + d*x)^2)*(1/
(2*b*log(F)*(c + d*x)^2) + 1/(2*b^2*log(F)^2*(c + d*x)^4))))/(2*d)
```

3.264 $\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^7}\,dx$

Optimal. Leaf size=121

$$-\frac{F^{a+b(c+dx)^2}}{6d(c+dx)^6}-\frac{bF^{a+b(c+dx)^2}\log(F)}{12d(c+dx)^4}-\frac{b^2F^{a+b(c+dx)^2}\log^2(F)}{12d(c+dx)^2}+\frac{b^3F^a\text{Ei}(b(c+dx)^2\log(F))\log^3(F)}{12d}$$

```
[Out] -1/6*F^(a+b*(d*x+c)^2)/d/(d*x+c)^6-1/12*b*F^(a+b*(d*x+c)^2)*ln(F)/d/(d*x+c)
^4-1/12*b^2*F^(a+b*(d*x+c)^2)*ln(F)^2/d/(d*x+c)^2+1/12*b^3*F^a*Ei(b*(d*x+c)
^2*ln(F))*ln(F)^3/d
```

Rubi [A]
time = 0.18, antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2245, 2241}

$$\frac{b^3F^a\log^3(F)\text{Ei}(b(c+dx)^2\log(F))}{12d}-\frac{b^2\log^2(F)F^{a+b(c+dx)^2}}{12d(c+dx)^2}-\frac{F^{a+b(c+dx)^2}}{6d(c+dx)^6}-\frac{b\log(F)F^{a+b(c+dx)^2}}{12d(c+dx)^4}$$

Antiderivative was successfully verified.

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

```
[Out] -1/6*F^(a + b*(c + d*x)^2)/(d*(c + d*x)^6) - (b*F^(a + b*(c + d*x)^2)*Log[F
])/(12*d*(c + d*x)^4) - (b^2*F^(a + b*(c + d*x)^2)*Log[F]^2)/(12*d*(c + d*x
)^2) + (b^3*F^a*ExpIntegralEi[b*(c + d*x)^2*Log[F]]*Log[F]^3)/(12*d)
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^7}\,dx = -\frac{F^{a+b(c+dx)^2}}{6d(c+dx)^6} + \frac{1}{3}(b\log(F))\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^5}\,dx$$
$$= -\frac{F^{a+b(c+dx)^2}}{6d(c+dx)^6} - \frac{bF^{a+b(c+dx)^2}\log(F)}{12d(c+dx)^4} + \frac{1}{6}\left(b^2\log^2(F)\right)\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^3}\,dx$$
$$= -\frac{F^{a+b(c+dx)^2}}{6d(c+dx)^6} - \frac{bF^{a+b(c+dx)^2}\log(F)}{12d(c+dx)^4} - \frac{b^2F^{a+b(c+dx)^2}\log^2(F)}{12d(c+dx)^2} + \frac{1}{6}\left(b^3\log^3(F)\right)\int \frac{F^{a+b(c+}}{c+d}$$
$$= -\frac{F^{a+b(c+dx)^2}}{6d(c+dx)^6} - \frac{bF^{a+b(c+dx)^2}\log(F)}{12d(c+dx)^4} - \frac{b^2F^{a+b(c+dx)^2}\log^2(F)}{12d(c+dx)^2} + \frac{b^3F^a\text{Ei}(b(c+dx)^2\log(F}{12d}$$

Mathematica [A]
time = 0.22, size = 79, normalized size = 0.65

$$\frac{F^a\left(b^3\text{Ei}(b(c+dx)^2\log(F))\log^3(F) - \frac{F^{b(c+dx)^2}\left(2+b(c+dx)^2\log(F)+b^2(c+dx)^4\log^2(F)\right)}{(c+dx)^6}\right)}{12d}$$

Antiderivative was successfully verified.

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

```
[Out] (F^a*(b^3*ExpIntegralEi[b*(c + d*x)^2*Log[F]]*Log[F]^3 - (F^(b*(c + d*x)^2)
*(2 + b*(c + d*x)^2*Log[F] + b^2*(c + d*x)^4*Log[F]^2))/(c + d*x)^6))/(12*d
)
```

Maple [A]
time = 0.08, size = 119, normalized size = 0.98

method	result	size
risch	$-\frac{F^{b(dx+c)^2}F^a}{6d(dx+c)^6} - \frac{b\ln(F)F^{b(dx+c)^2}F^a}{12d(dx+c)^4} - \frac{b^2\ln(F)^2F^{b(dx+c)^2}F^a}{12d(dx+c)^2} - \frac{b^3\ln(F)^3F^a\,\text{expIntegral}\left(1,-b(dx+c)^2\ln(F)\right)}{12d}$	119

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)/(d*x+c)^7,x,method=_RETURNVERBOSE)
```

```
[Out] -1/6/d/(d*x+c)^6*F^(b*(d*x+c)^2)*F^a-1/12/d*b*ln(F)/(d*x+c)^4*F^(b*(d*x+c)^
2)*F^a-1/12/d*b^2*ln(F)^2/(d*x+c)^2*F^(b*(d*x+c)^2)*F^a-1/12/d*b^3*ln(F)^3*
F^a*Ei(1,-b*(d*x+c)^2*ln(F))
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^7, x)

Fricas [**B**] Leaf count of result is larger than twice the leaf count of optimal. 292 vs. $2(113) = 226$.
time = 0.39, size = 292, normalized size = 2.41

$$\frac{(b^3d^6x^6 + 6\,b^3cd^5x^5 + 15\,b^3c^2d^4x^4 + 20\,b^3c^3d^3x^3 + 15\,b^3c^4d^2x^2 + 6\,b^3c^5dx + b^3c^6)F^a\mathrm{Ei}((bd^2x^2 + 2\,bcdx + bc^2)\log(F))\log(F)^3 - \left((b^2d^4x^4 + 4\,b^2cd^3x^3 + 6\,b^2c^2d^2x^2 + 4\,b^2c^3dx + b^2c^4)\log(F)^2 + (bd^2x^2 + 2\,bcdx + bc^2)\log(F) + 2\right)F^{bd^2x^2+2\,bcdx+bc^2+a}}{12\,(d^7x^6 + 6\,cd^6x^5 + 15\,c^2d^5x^4 + 20\,c^3d^4x^3 + 15\,c^4d^3x^2 + 6\,c^5d^2x + c^6d)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 1/12*((b^3*d^6*x^6 + 6*b^3*c*d^5*x^5 + 15*b^3*c^2*d^4*x^4 + 20*b^3*c^3*d^3*x^3 + 15*b^3*c^4*d^2*x^2 + 6*b^3*c^5*d*x + b^3*c^6)*F^a*Ei((b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F))*log(F)^3 - ((b^2*d^4*x^4 + 4*b^2*c*d^3*x^3 + 6*b^2*c^2*d^2*x^2 + 4*b^2*c^3*d*x + b^2*c^4)*log(F)^2 + (b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F) + 2)*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a))/(d^7*x^6 + 6*c*d^6*x^5 + 15*c^2*d^5*x^4 + 20*c^3*d^4*x^3 + 15*c^4*d^3*x^2 + 6*c^5*d^2*x + c^6*d)

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F**(a+b*(d*x+c)**2)/(d*x+c)**7,x)

[Out] Timed out

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^7, x)

Mupad [**B**]
time = 3.82, size = 104, normalized size = 0.86

$$-\frac{F^a\,b^3\ln(F)^3\,\mathrm{expint}\left(-b\,\ln(F)\,\left(c+d\,x\right)^2\right)}{12\,d}-\frac{F^a\,F^{b\,(c+d\,x)^2}\,b^3\ln(F)^3\,\left(\frac{1}{6\,b\,\ln(F)\,(c+d\,x)^2}+\frac{1}{6\,b^2\ln(F)^2\,(c+d\,x)^4}+\frac{1}{3\,b^3\ln(F)^3\,(c+d\,x)^6}\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] - (F^a*b^3*log(F)^3*expint(-b*log(F)*(c + d*x)^2))/(12*d) - (F^a*F^(b*(c +
d*x)^2)*b^3*log(F)^3*(1/(6*b*log(F)*(c + d*x)^2) + 1/(6*b^2*log(F)^2*(c + d
*x)^4) + 1/(3*b^3*log(F)^3*(c + d*x)^6)))/(2*d)
```

3.265 $\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^9}\,dx$

Optimal. Leaf size=31

$$-\frac{b^4F^a\Gamma(-4,-b(c+dx)^2\log(F))\log^4(F)}{2d}$$

```
[Out] -1/2*F^a/(d*x+c)^8*Ei(5,-b*(d*x+c)^2*ln(F))/d
```

Rubi [A]
time = 0.04, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = $\{2250\}$

$$-\frac{b^4F^a\log^4(F)\text{Gamma}(-4,-b\log(F)(c+dx)^2)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)/(c + d*x)^9,x]
```

```
[Out] -1/2*(b^4*F^a*Gamma[-4, -(b*(c + d*x)^2*Log[F])]*Log[F]^4)/d
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^9}\,dx = -\frac{b^4F^a\Gamma(-4,-b(c+dx)^2\log(F))\log^4(F)}{2d}$$

Mathematica [A]
time = 0.17, size = 31, normalized size = 1.00

$$-\frac{b^4F^a\Gamma(-4,-b(c+dx)^2\log(F))\log^4(F)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)/(c + d*x)^9,x]
```

```
[Out] -1/2*(b^4*F^a*Gamma[-4, -(b*(c + d*x)^2*Log[F])]*Log[F]^4)/d
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 151 vs. $2(29) = 58$.
time = 0.11, size = 152, normalized size = 4.90

method	result
risch	$-\frac{F^{b(dx+c)^2} F^a}{8d(dx+c)^8} - \frac{b\ln(F) F^{b(dx+c)^2} F^a}{24d(dx+c)^6} - \frac{b^2 \ln(F)^2 F^{b(dx+c)^2} F^a}{48d(dx+c)^4} - \frac{b^3 \ln(F)^3 F^{b(dx+c)^2} F^a}{48d(dx+c)^2} - \frac{b^4 \ln(F)^4 F^a \operatorname{expIntegral}\left(1, -b(d\right.}{48d}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)/(d*x+c)^9,x,method=_RETURNVERBOSE)
```

```
[Out] -1/8/d/(d*x+c)^8*F^(b*(d*x+c)^2)*F^a-1/24/d*b*ln(F)/(d*x+c)^6*F^(b*(d*x+c)^
2)*F^a-1/48/d*b^2*ln(F)^2/(d*x+c)^4*F^(b*(d*x+c)^2)*F^a-1/48/d*b^3*ln(F)^3/
(d*x+c)^2*F^(b*(d*x+c)^2)*F^a-1/48/d*b^4*ln(F)^4*F^a*Ei(1,-b*(d*x+c)^2*ln(F
))
```

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^9,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^9, x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 430 vs. $2(29) = 58$.
time = 0.08, size = 430, normalized size = 13.87

$$\frac{(b^4d^8x^8 + 8\,b^4cd^7x^7 + 28\,b^4c^2d^6x^6 + 56\,b^4c^3d^5x^5 + 70\,b^4c^4d^4x^4 + 56\,b^4c^5d^3x^3 + 28\,b^4c^6d^2x^2 + 8\,b^4c^7dx + b^4c^8)F^a\mathrm{Ei}((bd^2x^2 + 2\,bcdx + bc^2)\log(F))\log(F)^4 - ((b^3d^6x^6 + 6\,b^3cd^5x^5 + 15\,b^3c^2d^4x^4 + 20\,b^3c^3d^3x^3 + 15\,b^3c^4d^2x^2 + 6\,b^3c^5dx + b^3c^6)\log(F)^3 + (b^2d^4x^4 + 4\,b^2cd^3x^3 + 6\,b^2c^2d^2x^2 + 4\,b^2c^3dx + b^2c^4)\log(F)^2 + 2\,(bd^2x^2 + 2\,bcdx + bc^2)\log(F) + 6)F^{bd^2x^2+2\,bcdx+bc^2+a}}{48\,(d^9x^8 + 8\,cd^8x^7 + 28\,c^2d^7x^6 + 56\,c^3d^6x^5 + 70\,c^4d^5x^4 + 56\,c^5d^4x^3 + 28\,c^6d^3x^2 + 8\,c^7d^2x + c^8d)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^9,x, algorithm="fricas")
```

```
[Out] 1/48*((b^4*d^8*x^8 + 8*b^4*c*d^7*x^7 + 28*b^4*c^2*d^6*x^6 + 56*b^4*c^3*d^5*
x^5 + 70*b^4*c^4*d^4*x^4 + 56*b^4*c^5*d^3*x^3 + 28*b^4*c^6*d^2*x^2 + 8*b^4*
c^7*d*x + b^4*c^8)*F^a*Ei((b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F))*log(F)^4
- ((b^3*d^6*x^6 + 6*b^3*c*d^5*x^5 + 15*b^3*c^2*d^4*x^4 + 20*b^3*c^3*d^3*x^3
 + 15*b^3*c^4*d^2*x^2 + 6*b^3*c^5*d*x + b^3*c^6)*log(F)^3 + (b^2*d^4*x^4 +
4*b^2*c*d^3*x^3 + 6*b^2*c^2*d^2*x^2 + 4*b^2*c^3*d*x + b^2*c^4)*log(F)^2 + 2
*(b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F) + 6)*F^(b*d^2*x^2 + 2*b*c*d*x + b*c
^2 + a))/(d^9*x^8 + 8*c*d^8*x^7 + 28*c^2*d^7*x^6 + 56*c^3*d^6*x^5 + 70*c^4*
d^5*x^4 + 56*c^5*d^4*x^3 + 28*c^6*d^3*x^2 + 8*c^7*d^2*x + c^8*d)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(d*x+c)**9,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^9,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^9, x)
```

Mupad [**B**]
time = 3.81, size = 120, normalized size = 3.87

$$-\frac{F^a\,b^4\,\ln\left(F\right)^4\,\mathrm{expint}\left(-b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^2\right)}{48\,d}-\frac{F^a\,F^{b\,{\left(c+d\,x\right)}^2}\,b^4\,{\ln\left(F\right)}^4\,\left(\frac{1}{24\,b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^2}+\frac{1}{24\,b^2\,{\ln\left(F\right)}^2\,{\left(c+d\,x\right)}^4}+\frac{1}{12\,b^3\,{\ln\left(F\right)}^3\,{\left(c+d\,x\right)}^6}+\frac{1}{4\,b^4\,{\ln\left(F\right)}^4\,{\left(c+d\,x\right)}^8}\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(c + d*x)^9,x)
```

```
[Out] - (F^a*b^4*log(F)^4*expint(-b*log(F)*(c + d*x)^2))/(48*d) - (F^a*F^(b*(c +
d*x)^2)*b^4*log(F)^4*(1/(24*b*log(F)*(c + d*x)^2) + 1/(24*b^2*log(F)^2*(c +
 d*x)^4) + 1/(12*b^3*log(F)^3*(c + d*x)^6) + 1/(4*b^4*log(F)^4*(c + d*x)^8)
))/(2*d)
```

3.266 $\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^{11}}\,dx$

Optimal. Leaf size=31

$$\frac{b^5F^a\Gamma(-5,-b(c+dx)^2\log(F))\log^5(F)}{2d}$$

[Out] -1/2*F^a/(d*x+c)^10*Ei(6,-b*(d*x+c)^2*ln(F))/d

Rubi [A]
time = 0.04, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = $\{2250\}$

$$\frac{b^5F^a\log^5(F)\text{Gamma}(-5,-b\log(F)(c+dx)^2)}{2d}$$

Antiderivative was successfully verified.

[In] Int[F^(a + b*(c + d*x)^2)/(c + d*x)^11,x]

[Out] (b^5*F^a*Gamma[-5, -(b*(c + d*x)^2*Log[F])]*Log[F]^5)/(2*d)

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^{11}}\,dx = \frac{b^5F^a\Gamma(-5,-b(c+dx)^2\log(F))\log^5(F)}{2d}$$

Mathematica [A]
time = 0.19, size = 31, normalized size = 1.00

$$\frac{b^5F^a\Gamma(-5,-b(c+dx)^2\log(F))\log^5(F)}{2d}$$

Antiderivative was successfully verified.

[In] Integrate[F^(a + b*(c + d*x)^2)/(c + d*x)^11,x]

[Out] (b^5*F^a*Gamma[-5, -(b*(c + d*x)^2*Log[F])]*Log[F]^5)/(2*d)

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 184 vs. $2(29) = 58$.
time = 0.12, size = 185, normalized size = 5.97

method	result
risch	$-\frac{F^{b(dx+c)^2} F^a}{10d(dx+c)^{10}} - \frac{b\ln(F) F^{b(dx+c)^2} F^a}{40d(dx+c)^8} - \frac{b^2\ln(F)^2 F^{b(dx+c)^2} F^a}{120d(dx+c)^6} - \frac{b^3\ln(F)^3 F^{b(dx+c)^2} F^a}{240d(dx+c)^4} - \frac{b^4\ln(F)^4 F^{b(dx+c)^2} F^a}{240d(dx+c)^2} - b^5 \ln$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a+b*(d*x+c)^2)/(d*x+c)^11,x,method=_RETURNVERBOSE)

[Out] -1/10/d/(d*x+c)^10*F^(b*(d*x+c)^2)*F^a-1/40/d*b*ln(F)/(d*x+c)^8*F^(b*(d*x+c)^2)*F^a-1/120/d*b^2*ln(F)^2/(d*x+c)^6*F^(b*(d*x+c)^2)*F^a-1/240/d*b^3*ln(F)^3/(d*x+c)^4*F^(b*(d*x+c)^2)*F^a-1/240/d*b^4*ln(F)^4/(d*x+c)^2*F^(b*(d*x+c)^2)*F^a-1/240/d*b^5*ln(F)^5*F^a*Ei(1,-b*(d*x+c)^2*ln(F))

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

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^11,x, algorithm="maxima")

[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^11, x)

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 596 vs. $2(29) = 58$.
time = 0.10, size = 596, normalized size = 19.23

$$\frac{(b^5d^{10}x^{10} + 10\,b^5cd^9x^9 + 45\,b^5c^2d^8x^8 + 120\,b^5c^3d^7x^7 + 210\,b^5c^4d^6x^6 + 252\,b^5c^5d^5x^5 + 210\,b^5c^6d^4x^4 + 120\,b^5c^7d^3x^3 + 45\,b^5c^8d^2x^2 + 10\,b^5c^9dx + b^5c^{10})F^a\mathrm{Ei}((bd^2x^2 + 2\,bcdx + bc^2)\log(F))\log(F)^5 - ((b^4d^8x^8 + 8\,b^4cd^7x^7 + 28\,b^4c^2d^6x^6 + 56\,b^4c^3d^5x^5 + 70\,b^4c^4d^4x^4 + 56\,b^4c^5d^3x^3 + 28\,b^4c^6d^2x^2 + 8\,b^4c^7dx + b^4c^8)\log(F)^4 + (b^3d^6x^6 + 6\,b^3cd^5x^5 + 15\,b^3c^2d^4x^4 + 20\,b^3c^3d^3x^3 + 15\,b^3c^4d^2x^2 + 6\,b^3c^5dx + b^3c^6)\log(F)^3 + 2\,(b^2d^4x^4 + 4\,b^2cd^3x^3 + 6\,b^2c^2d^2x^2 + 4\,b^2c^3dx + b^2c^4)\log(F)^2 + 6\,(bd^2x^2 + 2\,bcdx + bc^2)\log(F) + 24)F^{bd^2x^2+2bcdx+bc^2+a}}{240\,(d^{11}x^{10} + 10\,cd^{10}x^9 + 45\,c^2d^9x^8 + 120\,c^3d^8x^7 + 210\,c^4d^7x^6 + 252\,c^5d^6x^5 + 210\,c^6d^5x^4 + 120\,c^7d^4x^3 + 45\,c^8d^3x^2 + 10\,c^9d^2x + c^{10}d)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^11,x, algorithm="fricas")

[Out] 1/240*((b^5*d^10*x^10 + 10*b^5*c*d^9*x^9 + 45*b^5*c^2*d^8*x^8 + 120*b^5*c^3*d^7*x^7 + 210*b^5*c^4*d^6*x^6 + 252*b^5*c^5*d^5*x^5 + 210*b^5*c^6*d^4*x^4 + 120*b^5*c^7*d^3*x^3 + 45*b^5*c^8*d^2*x^2 + 10*b^5*c^9*d*x + b^5*c^10)*F^a*Ei((b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F))*log(F)^5 - ((b^4*d^8*x^8 + 8*b^4*c*d^7*x^7 + 28*b^4*c^2*d^6*x^6 + 56*b^4*c^3*d^5*x^5 + 70*b^4*c^4*d^4*x^4 + 56*b^4*c^5*d^3*x^3 + 28*b^4*c^6*d^2*x^2 + 8*b^4*c^7*d*x + b^4*c^8)*log(F)^4 + (b^3*d^6*x^6 + 6*b^3*c*d^5*x^5 + 15*b^3*c^2*d^4*x^4 + 20*b^3*c^3*d^3*x^3 + 15*b^3*c^4*d^2*x^2 + 6*b^3*c^5*d*x + b^3*c^6)*log(F)^3 + 2*(b^2*d^4*x^4 + 4*b^2*c*d^3*x^3 + 6*b^2*c^2*d^2*x^2 + 4*b^2*c^3*d*x + b^2*c^4)*log(F)^2

```
 + 6*(b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F) + 24)*F^(b*d^2*x^2 + 2*b*c*d*x
+ b*c^2 + a))/(d^11*x^10 + 10*c*d^10*x^9 + 45*c^2*d^9*x^8 + 120*c^3*d^8*x^7
 + 210*c^4*d^7*x^6 + 252*c^5*d^6*x^5 + 210*c^6*d^5*x^4 + 120*c^7*d^4*x^3 +
45*c^8*d^3*x^2 + 10*c^9*d^2*x + c^10*d)
```

Sympy **[F(-1)]** Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(d*x+c)**11,x)
```

```
[Out] Timed out
```

Giac **[F]**
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^11,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^11, x)
```

Mupad **[B]**
time = 3.91, size = 136, normalized size = 4.39

$$-\frac{F^a\,b^5\ln\left(F\right)^5\,\mathrm{expint}\left(-b\ln\left(F\right)\,{\left(c+d\,x\right)}^2\right)}{240\,d}-\frac{F^a\,F^{b\,{\left(c+d\,x\right)}^2}\,b^5\ln\left(F\right)^5\left(\frac{1}{120\,b\ln\left(F\right)\,{\left(c+d\,x\right)}^2}+\frac{1}{120\,b^2\ln\left(F\right)^2\,{\left(c+d\,x\right)}^4}+\frac{1}{60\,b^3\ln\left(F\right)^3\,{\left(c+d\,x\right)}^6}+\frac{1}{20\,b^4\ln\left(F\right)^4\,{\left(c+d\,x\right)}^8}+\frac{1}{5\,b^5\ln\left(F\right)^5\,{\left(c+d\,x\right)}^{10}}\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(c + d*x)^11,x)
```

```
[Out] - (F^a*b^5*log(F)^5*expint(-b*log(F)*(c + d*x)^2))/(240*d) - (F^a*F^(b*(c +
 d*x)^2)*b^5*log(F)^5*(1/(120*b*log(F)*(c + d*x)^2) + 1/(120*b^2*log(F)^2*(
c + d*x)^4) + 1/(60*b^3*log(F)^3*(c + d*x)^6) + 1/(20*b^4*log(F)^4*(c + d*x
)^8) + 1/(5*b^5*log(F)^5*(c + d*x)^10)))/(2*d)
```

3.267 $\int F^{a+b(c+dx)^2}(c+dx)^{12}\,dx$

Optimal. Leaf size=49

$$-\frac{F^a(c+dx)^{13}\Gamma\left(\frac{13}{2},-b(c+dx)^2\log(F)\right)}{2d\left(-b(c+dx)^2\log(F)\right)^{13/2}}$$

```
[Out] -1/2*F^a*(d*x+c)^13*(524288/5621533568633696205238621875*GAMMA(51/2,-b*(d*x
+c)^2*ln(F))-524288/5621533568633696205238621875*(-b*(d*x+c)^2*ln(F))^(49/2
)*exp(b*(d*x+c)^2*ln(F))-262144/114725174870075432759971875*(-b*(d*x+c)^2*l
n(F))^(47/2)*exp(b*(d*x+c)^2*ln(F))-131072/2440961167448413462978125*(-b*(d
*x+c)^2*ln(F))^(45/2)*exp(b*(d*x+c)^2*ln(F))-65536/54243581498853632510625*
(-b*(d*x+c)^2*ln(F))^(43/2)*exp(b*(d*x+c)^2*ln(F))-32768/126147863950822401
1875*(-b*(d*x+c)^2*ln(F))^(41/2)*exp(b*(d*x+c)^2*ln(F))-16384/3076777169532
2536875*(-b*(d*x+c)^2*ln(F))^(39/2)*exp(b*(d*x+c)^2*ln(F))-8192/78891722295
6988125*(-b*(d*x+c)^2*ln(F))^(37/2)*exp(b*(d*x+c)^2*ln(F))-4096/21322087106
945625*(-b*(d*x+c)^2*ln(F))^(35/2)*exp(b*(d*x+c)^2*ln(F))-2048/609202488769
875*(-b*(d*x+c)^2*ln(F))^(33/2)*exp(b*(d*x+c)^2*ln(F))-1024/18460681477875*
(-b*(d*x+c)^2*ln(F))^(31/2)*exp(b*(d*x+c)^2*ln(F))-512/595505854125*(-b*(d*
x+c)^2*ln(F))^(29/2)*exp(b*(d*x+c)^2*ln(F))-256/20534684625*(-b*(d*x+c)^2*l
n(F))^(27/2)*exp(b*(d*x+c)^2*ln(F))-128/760543875*(-b*(d*x+c)^2*ln(F))^(25/
2)*exp(b*(d*x+c)^2*ln(F))-64/30421755*(-b*(d*x+c)^2*ln(F))^(23/2)*exp(b*(d*
x+c)^2*ln(F))-32/1322685*(-b*(d*x+c)^2*ln(F))^(21/2)*exp(b*(d*x+c)^2*ln(F))
-16/62985*(-b*(d*x+c)^2*ln(F))^(19/2)*exp(b*(d*x+c)^2*ln(F))-8/3315*(-b*(d*
x+c)^2*ln(F))^(17/2)*exp(b*(d*x+c)^2*ln(F))-4/195*(-b*(d*x+c)^2*ln(F))^(15/
2)*exp(b*(d*x+c)^2*ln(F))-2/13*(-b*(d*x+c)^2*ln(F))^(13/2)*exp(b*(d*x+c)^2*
ln(F)))/d/(-b*(d*x+c)^2*ln(F))^(13/2)
```

Rubi [A]
time = 0.05, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$-\frac{F^a(c+dx)^{13}\text{Gamma}\left(\frac{13}{2},-b\log(F)(c+dx)^2\right)}{2d\left(-b\log(F)(c+dx)^2\right)^{13/2}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x)^12,x]
```

```
[Out] -1/2*(F^a*(c + d*x)^13*Gamma[13/2, -(b*(c + d*x)^2*Log[F])])/(d*(-(b*(c + d
*x)^2*Log[F]))^(13/2))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
```

```
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)^{12}\,dx=-\frac{F^a(c+dx)^{13}\Gamma\left(\frac{13}{2},-b(c+dx)^2\log(F)\right)}{2d\left(-b(c+dx)^2\log(F)\right)^{13/2}}$$

Mathematica [A]
time = 0.67, size = 49, normalized size = 1.00

$$-\frac{F^a(c+dx)^{13}\Gamma\left(\frac{13}{2},-b(c+dx)^2\log(F)\right)}{2d\left(-b(c+dx)^2\log(F)\right)^{13/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x)^12,x]
```

```
[Out] -1/2*(F^a*(c + d*x)^13*Gamma[13/2, -(b*(c + d*x)^2*Log[F])])/(d*(-(b*(c + d
*x)^2*Log[F]))^(13/2))
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 1895 vs. 2(578) = 1156.
time = 0.34, size = 1896, normalized size = 38.69

method	result	size
risch	Expression too large to display	1896

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)*(d*x+c)^12,x,method=_RETURNVERBOSE)
```

```
[Out] 55/2*d*c^9/ln(F)/b*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+11/2*c^10/
ln(F)/b*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-99/4*c^8/ln(F)^2/b^2*x*
F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+693/8*c^6/ln(F)^3/b^3*x*F^(b*d^2*
x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+10395/32*c^2/ln(F)^5/b^5*x*F^(b*d^2*x^2)*F
^(2*b*c*d*x)*F^(b*c^2)*F^a-3465/16*c^4/ln(F)^4/b^4*x*F^(b*d^2*x^2)*F^(2*b*c
*d*x)*F^(b*c^2)*F^a-11/4*d^8/ln(F)^2/b^2*x^9*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^
(b*c^2)*F^a-693/16/d*c^5/ln(F)^4/b^4*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*
F^a+3465/32/d*c^3/ln(F)^5/b^5*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-103
95/64/d*c/ln(F)^6/b^6*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+1/2/d*c^11/
ln(F)/b*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-11/4/d*c^9/ln(F)^2/b^2*F^
(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+99/8/d*c^7/ln(F)^3/b^3*F^(b*d^2*x^2
```

```
)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-10395/128/d/ln(F)^6/b^6*Pi^(1/2)*F^a/(-b*ln(F
))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))-10395/64/ln(
F)^6/b^6*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-99*d*c^7/ln(F)^2/b^2*x
^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-231*d^2*c^6/ln(F)^2/b^2*x^3*F^
(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+165*d^6*c^4/ln(F)/b*x^7*F^(b*d^2*x^
2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+231*d^5*c^5/ln(F)/b*x^6*F^(b*d^2*x^2)*F^(2*b
*c*d*x)*F^(b*c^2)*F^a+165/2*d^7*c^3/ln(F)/b*x^8*F^(b*d^2*x^2)*F^(2*b*c*d*x)
*F^(b*c^2)*F^a+2079/8*d*c^5/ln(F)^3/b^3*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(
b*c^2)*F^a-99*d^6*c^2/ln(F)^2/b^2*x^7*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)
*F^a+2079/8*d^4*c^2/ln(F)^3/b^3*x^5*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F
^a-3465/8*d^2*c^2/ln(F)^4/b^4*x^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a
+55/2*d^8*c^2/ln(F)/b*x^9*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+11/2*d^
9*c/ln(F)/b*x^10*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+3465/8*d^3*c^3/l
n(F)^3/b^3*x^4*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-231*d^5*c^3/ln(F)^
2/b^2*x^6*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-3465/8*d*c^3/ln(F)^4/b^
4*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-693/2*d^4*c^4/ln(F)^2/b^2*x
^5*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+3465/8*d^2*c^4/ln(F)^3/b^3*x^3
*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-3465/16*d^3*c/ln(F)^4/b^4*x^4*F^
(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+693/8*d^5*c/ln(F)^3/b^3*x^6*F^(b*d^
2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+10395/32*d*c/ln(F)^5/b^5*x^2*F^(b*d^2*x^
2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-99/4*d^7*c/ln(F)^2/b^2*x^8*F^(b*d^2*x^2)*F^(
2*b*c*d*x)*F^(b*c^2)*F^a-693/2*d^3*c^5/ln(F)^2/b^2*x^4*F^(b*d^2*x^2)*F^(2*b
*c*d*x)*F^(b*c^2)*F^a+231*d^4*c^6/ln(F)/b*x^5*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F
^(b*c^2)*F^a+165*d^3*c^7/ln(F)/b*x^4*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*
F^a+165/2*d^2*c^8/ln(F)/b*x^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+1/2
*d^10/ln(F)/b*x^11*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+99/8*d^6/ln(F)
^3/b^3*x^7*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-693/16*d^4/ln(F)^4/b^4
*x^5*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+3465/32*d^2/ln(F)^5/b^5*x^3*
F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a
```

Maxima [**B**] Leaf count of result is larger than twice the leaf count of optimal. 6135 vs. $2(559) = 1118$.
time = 1.61, size = 6135, normalized size = 125.20

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^12,x, algorithm="maxima")
```

```
[Out] -6*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*d)
)*F^a*c^11/sqrt(b*log(F)) + 33*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(erf(sqr
t(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2)*d^3
*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2/(b*d
```

^2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma(3/2,
 -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(-(b*d
^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*c^10*d/sqrt(b*log(F)) - 110*(sq
rt(pi)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d
^2))) - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/((b*log(F))^
(7/2)*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(
F)/(b*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2*log(F)/(b*
d^2))^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^2/(
(b*log(F))^(7/2)*d^3))*F^a*c^9*d^2/sqrt(b*log(F)) + 495/2*(sqrt(pi)*(b*d^2*
x + b*c*d)*b^4*c^4*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log
(F)^5/((b*log(F))^(9/2)*d^5*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 4*
F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^4*c^3*log(F)^4/((b*log(F))^(9/2)*d^4) - 6
*(b*d^2*x + b*c*d)^3*b^2*c^2*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2)
)*log(F)^5/((b*log(F))^(9/2)*d^7*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2
)) + 4*b^3*c*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log
(F))^(9/2)*d^4) - (b*d^2*x + b*c*d)^5*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))*log(F)^5/((b*log(F))^(9/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d
^2))^(5/2)))*F^a*c^8*d^3/sqrt(b*log(F)) - 396*(sqrt(pi)*(b*d^2*x + b*c*d)*b
^5*c^5*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^6/((b*lo
g(F))^(11/2)*d^6*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 5*F^((b*d^2*x
 + b*c*d)^2/(b*d^2))*b^5*c^4*log(F)^5/((b*log(F))^(11/2)*d^5) - 10*(b*d^2*x
 + b*c*d)^3*b^3*c^3*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^
6/((b*log(F))^(11/2)*d^8*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 10*
b^4*c^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^
(11/2)*d^5) - b^3*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((
b*log(F))^(11/2)*d^5) - 5*(b*d^2*x + b*c*d)^5*b*c*gamma(5/2, -(b*d^2*x + b*
c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(11/2)*d^10*(-(b*d^2*x + b*c*d)
^2*log(F)/(b*d^2))^(5/2)))*F^a*c^7*d^4/sqrt(b*log(F)) + 462*(sqrt(pi)*(b*d^
2*x + b*c*d)*b^6*c^6*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*l
og(F)^7/((b*log(F))^(13/2)*d^7*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) -
 6*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^6*c^5*log(F)^6/((b*log(F))^(13/2)*d^6)
 - 15*(b*d^2*x + b*c*d)^3*b^4*c^4*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))*log(F)^7/((b*log(F))^(13/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2)
)^(3/2)) + 20*b^5*c^3*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^
5/((b*log(F))^(13/2)*d^6) - 6*b^4*c*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))*log(F)^4/((b*log(F))^(13/2)*d^6) - 15*(b*d^2*x + b*c*d)^5*b^2*c^2*ga
mma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d
^11*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) - (b*d^2*x + b*c*d)^7*gamm
a(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^1
3*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)))*F^a*c^6*d^5/sqrt(b*log(F))
- 396*(sqrt(pi)*(b*d^2*x + b*c*d)*b^7*c^7*(erf(sqrt(-(b*d^2*x + b*c*d)^2*lo
g(F)/(b*d^2))) - 1)*log(F)^8/((b*log(F))^(15/2)*d^8*sqrt(-(b*d^2*x + b*c*d)
^2*log(F)/(b*d^2))) - 7*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^7*c^6*log(F)^7/((
b*log(F))^(15/2)*d^7) - 21*(b*d^2*x + b*c*d)^3*b^5*c^5*gamma(3/2, -(b*d^2*x

```
 + b*c*d)^2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(15/2)*d^10*(-(b*d^2*x + b
*c*d)^2*log(F)/(b*d^2))^(3/2)) + 35*b^6*c^4*gamma(2, -(b*d^2*x + b*c*d)^2*l
og(F)/(b*d^2))*log(F)^6/((b*log(F))^(15/2)*d^7) - 21*b^5*c^2*gamma(3, -(b*d
^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(15/2)*d^7) - 35*(b*d^
2*x + b*c*d)^5*b^3*c^3*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(
F)^8/((b*log(F))^(15/2)*d^12*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) +
 b^4*gamma(4, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(15
/2)*d^7) - 7*(b*d^2*x + b*c*d)^7*b*c*gamma(7/2, -(b*d^2*x + b*c*d)^2*log(F)
/(b*d^2))*log(F)^8/((b*log(F))^(15/2)*d^14*(-(b*d^2*x + b*c*d)^2*log(F)/(b*
d^2))^(7/2)))*F^a*c^5*d^6/sqrt(b*log(F)) + 495/2*(sqrt(pi)*(b*d^2*x + b*c*d
)*b^8*c^8*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^9/((b
*log(F))^(17/2)*d^9*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 8*F^((b*d^
2*x + b*c*d)^2/(b*d^2))*b^8*c^7*log(F)^8/((b*log(F))^(17/2)*d^8) - 28*(b*d^
2*x + b*c*d)^3*b^6*c^6*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(
F)^9/((b*log(F))^(17/2)*d^11*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) +
 56*b^7*c^5*gamma(2, -(b*d^2*x + b*c*d)^2*log(F...
```

Fricas [A]
time = 0.09, size = 617, normalized size = 12.59

$$-\frac{10395 \sqrt{\pi} \sqrt{-b d^{2} \log\left(F\right)} F^{a} \operatorname{erf}\left(\frac{\sqrt{-b d^{2} \log\left(F\right)} (d x + c)}{d}\right) - 2 \left(32 \left(b^{6} d^{12} x^{11} + 11 b^{6} c d^{11} x^{10} + 55 b^{6} c^{2} d^{10} x^{9} + 165 b^{6} c^{3} d^{9} x^{8} + 330 b^{6} c^{4} d^{8} x^{7} + 462 b^{6} c^{5} d^{7} x^{6} + 462 b^{6} c^{6} d^{6} x^{5} + 330 b^{6} c^{7} d^{5} x^{4} + 165 b^{6} c^{8} d^{4} x^{3} + 55 b^{6} c^{9} d^{3} x^{2} + 11 b^{6} c^{10} d^{2} x + b^{6} c^{11} d\right) \log\left(F\right)^{6} - 176 \left(b^{5} d^{10} x^{9} + 9 b^{5} c d^{9} x^{8} + 36 b^{5} c^{2} d^{8} x^{7} + 84 b^{5} c^{3} d^{7} x^{6} + 126 b^{5} c^{4} d^{6} x^{5} + 126 b^{5} c^{5} d^{5} x^{4} + 84 b^{5} c^{6} d^{4} x^{3} + 36 b^{5} c^{7} d^{3} x^{2} + 9 b^{5} c^{8} d^{2} x + b^{5} c^{9} d\right) \log\left(F\right)^{5} + 792 \left(b^{4} d^{8} x^{7} + 7 b^{4} c d^{7} x^{6} + 21 b^{4} c^{2} d^{6} x^{5} + 35 b^{4} c^{3} d^{5} x^{4} + 35 b^{4} c^{4} d^{4} x^{3} + 21 b^{4} c^{5} d^{3} x^{2} + 7 b^{4} c^{6} d^{2} x + b^{4} c^{7} d\right) \log\left(F\right)^{4} - 2772 \left(b^{3} d^{6} x^{5} + 5 b^{3} c d^{5} x^{4} + 10 b^{3} c^{2} d^{4} x^{3} + 10 b^{3} c^{3} d^{3} x^{2} + 5 b^{3} c^{4} d^{2} x + b^{3} c^{5} d\right) \log\left(F\right)^{3} + 6930 \left(b^{2} d^{4} x^{3} + 3 b^{2} c d^{3} x^{2} + 3 b^{2} c^{2} d^{2} x + b^{2} c^{3} d\right) \log\left(F\right)^{2} - 10395 \left(b d^{2} x + b c d\right) \log\left(F\right)\right) F^{b d^{2} x^{2} + 2 b c d x + b c^{2} + a}}{128 b^{7} d^{2} \log\left(F\right)^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^12,x, algorithm="fricas")
```

```
[Out] -1/128*(10395*sqrt(pi)*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^2*log(F))*(d*x
 + c)/d) - 2*(32*(b^6*d^12*x^11 + 11*b^6*c*d^11*x^10 + 55*b^6*c^2*d^10*x^9
+ 165*b^6*c^3*d^9*x^8 + 330*b^6*c^4*d^8*x^7 + 462*b^6*c^5*d^7*x^6 + 462*b^6
*c^6*d^6*x^5 + 330*b^6*c^7*d^5*x^4 + 165*b^6*c^8*d^4*x^3 + 55*b^6*c^9*d^3*x
^2 + 11*b^6*c^10*d^2*x + b^6*c^11*d)*log(F)^6 - 176*(b^5*d^10*x^9 + 9*b^5*c
*d^9*x^8 + 36*b^5*c^2*d^8*x^7 + 84*b^5*c^3*d^7*x^6 + 126*b^5*c^4*d^6*x^5 +
126*b^5*c^5*d^5*x^4 + 84*b^5*c^6*d^4*x^3 + 36*b^5*c^7*d^3*x^2 + 9*b^5*c^8*d
^2*x + b^5*c^9*d)*log(F)^5 + 792*(b^4*d^8*x^7 + 7*b^4*c*d^7*x^6 + 21*b^4*c^
2*d^6*x^5 + 35*b^4*c^3*d^5*x^4 + 35*b^4*c^4*d^4*x^3 + 21*b^4*c^5*d^3*x^2 +
7*b^4*c^6*d^2*x + b^4*c^7*d)*log(F)^4 - 2772*(b^3*d^6*x^5 + 5*b^3*c*d^5*x^4
 + 10*b^3*c^2*d^4*x^3 + 10*b^3*c^3*d^3*x^2 + 5*b^3*c^4*d^2*x + b^3*c^5*d)*l
og(F)^3 + 6930*(b^2*d^4*x^3 + 3*b^2*c*d^3*x^2 + 3*b^2*c^2*d^2*x + b^2*c^3*d
)*log(F)^2 - 10395*(b*d^2*x + b*c*d)*log(F))*F^(b*d^2*x^2 + 2*b*c*d*x + b*c
^2 + a))/(b^7*d^2*log(F)^7)
```

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

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c)**12,x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 3060 deep
```

Giac [A]
time = 1.45, size = 195, normalized size = 3.98

$$\frac{\left(32\,b^5d^{10}\left(x+\frac{c}{d}\right)^{11}\log\left(F\right)^5-176\,b^4d^8\left(x+\frac{c}{d}\right)^9\log\left(F\right)^4+792\,b^3d^6\left(x+\frac{c}{d}\right)^7\log\left(F\right)^3-2772\,b^2d^4\left(x+\frac{c}{d}\right)^5\log\left(F\right)^2+6930\,bd^2\left(x+\frac{c}{d}\right)^3\log\left(F\right)-10395\,x-\frac{10395\,c}{d}\right)e^{\left(bd^2x^2\log(F)+2\,bcdx\log(F)+bc^2\log(F)+a\log(F)\right)}}{64\,b^6\log\left(F\right)^6}-\frac{10395\,\sqrt{\pi}\,F^a\,\mathrm{erf}\left(-\sqrt{-b\log\left(F\right)}\,d\left(x+\frac{c}{d}\right)\right)}{128\,\sqrt{-b\log\left(F\right)}\,b^6d\log\left(F\right)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^12,x, algorithm="giac")
```

```
[Out] 1/64*(32*b^5*d^10*(x + c/d)^11*log(F)^5 - 176*b^4*d^8*(x + c/d)^9*log(F)^4
+ 792*b^3*d^6*(x + c/d)^7*log(F)^3 - 2772*b^2*d^4*(x + c/d)^5*log(F)^2 + 69
30*b*d^2*(x + c/d)^3*log(F) - 10395*x - 10395*c/d)*e^(b*d^2*x^2*log(F) + 2*
b*c*d*x*log(F) + b*c^2*log(F) + a*log(F))/(b^6*log(F)^6) - 10395/128*sqrt(p
i)*F^a*erf(-sqrt(-b*log(F))*d*(x + c/d))/(sqrt(-b*log(F))*b^6*d*log(F)^6)
```

Mupad [B]
time = 4.02, size = 209, normalized size = 4.27

$$\frac{\frac{F^a\left(\frac{10395\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,\ln(F)\,(c+d\,x)}{\sqrt{b\,\ln\left(F\right)}}\right)}{128}-\frac{10395\,F^{b\,(c+d\,x)^2}\,\sqrt{b\,\ln\left(F\right)}\,(c+d\,x)}{64}\right)}{\sqrt{b\,\ln\left(F\right)}}-\frac{693\,F^{a+b\,(c+d\,x)^2}\,b^2\ln(F)^2\,(c+d\,x)^5}{16}+\frac{99\,F^{a+b\,(c+d\,x)^2}\,b^3\ln(F)^3\,(c+d\,x)^7}{8}-\frac{11\,F^{a+b\,(c+d\,x)^2}\,b^4\ln(F)^4\,(c+d\,x)^9}{4}+\frac{F^{a+b\,(c+d\,x)^2}\,b^5\ln(F)^5\,(c+d\,x)^{11}}{2}+\frac{3465\,F^{a+b\,(c+d\,x)^2}\,b\ln(F)\,(c+d\,x)^3}{32}}{b^6\,d\ln\left(F\right)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x)^12,x)
```

```
[Out] ((F^a*((10395*pi^(1/2)*erfi((b*log(F)*(c + d*x))/(b*log(F))^(1/2)))/128 - (
10395*F^(b*(c + d*x)^2)*(b*log(F))^(1/2)*(c + d*x))/64))/(b*log(F))^(1/2) -
 (693*F^(a + b*(c + d*x)^2)*b^2*log(F)^2*(c + d*x)^5)/16 + (99*F^(a + b*(c
+ d*x)^2)*b^3*log(F)^3*(c + d*x)^7)/8 - (11*F^(a + b*(c + d*x)^2)*b^4*log(F
)^4*(c + d*x)^9)/4 + (F^(a + b*(c + d*x)^2)*b^5*log(F)^5*(c + d*x)^11)/2 +
(3465*F^(a + b*(c + d*x)^2)*b*log(F)*(c + d*x)^3)/32)/(b^6*d*log(F)^6)
```

3.268 $\int F^{a+b(c+dx)^2}(c+dx)^{10}\,dx$

Optimal. Leaf size=49

$$-\frac{F^a(c+dx)^{11}\Gamma\left(\frac{11}{2},-b(c+dx)^2\log(F)\right)}{2d\left(-b(c+dx)^2\log(F)\right)^{11/2}}$$

```
[Out] -1/2*F^a*(d*x+c)^11*(1048576/6183686925497065825762484062 5*GAMMA(51/2,-b*(d
*x+c)^2*ln(F))-1048576/618368692549706582576248406 25*(-b*(d*x+c)^2*ln(F))^(
49/2)*exp(b*(d*x+c)^2*ln(F))-524288/126197692357082976035969062 5*(-b*(d*x+c
)^2*ln(F))^(47/2)*exp(b*(d*x+c)^2*ln(F))-262144/26850572841932548092759375*
(-b*(d*x+c)^2*ln(F))^(45/2)*exp(b*(d*x+c)^2*ln(F))-131072/59667939648738995
7616875*(-b*(d*x+c)^2*ln(F))^(43/2)*exp(b*(d*x+c)^2*ln(F))-65536/1387626503
4590464130625*(-b*(d*x+c)^2*ln(F))^(41/2)*exp(b*(d*x+c)^2*ln(F))-32768/3384
45488648547905625*(-b*(d*x+c)^2*ln(F))^(39/2)*exp(b*(d*x+c)^2*ln(F))-16384/
8678089452526869375*(-b*(d*x+c)^2*ln(F))^(37/2)*exp(b*(d*x+c)^2*ln(F))-8192
/234542958176401875*(-b*(d*x+c)^2*ln(F))^(35/2)*exp(b*(d*x+c)^2*ln(F))-4096
/6701227376468625*(-b*(d*x+c)^2*ln(F))^(33/2)*exp(b*(d*x+c)^2*ln(F))-2048/2
03067496256625*(-b*(d*x+c)^2*ln(F))^(31/2)*exp(b*(d*x+c)^2*ln(F))-1024/6550
564395375*(-b*(d*x+c)^2*ln(F))^(29/2)*exp(b*(d*x+c)^2*ln(F))-512/2258815308
75*(-b*(d*x+c)^2*ln(F))^(27/2)*exp(b*(d*x+c)^2*ln(F))-256/8365982625*(-b*(d
*x+c)^2*ln(F))^(25/2)*exp(b*(d*x+c)^2*ln(F))-128/334639305*(-b*(d*x+c)^2*ln
(F))^(23/2)*exp(b*(d*x+c)^2*ln(F))-64/14549535*(-b*(d*x+c)^2*ln(F))^(21/2)*
exp(b*(d*x+c)^2*ln(F))-32/692835*(-b*(d*x+c)^2*ln(F))^(19/2)*exp(b*(d*x+c)^
2*ln(F))-16/36465*(-b*(d*x+c)^2*ln(F))^(17/2)*exp(b*(d*x+c)^2*ln(F))-8/2145
*(-b*(d*x+c)^2*ln(F))^(15/2)*exp(b*(d*x+c)^2*ln(F))-4/143*(-b*(d*x+c)^2*ln(
F))^(13/2)*exp(b*(d*x+c)^2*ln(F))-2/11*(-b*(d*x+c)^2*ln(F))^(11/2)*exp(b*(d
*x+c)^2*ln(F)))/d/(-b*(d*x+c)^2*ln(F))^(11/2)
```

Rubi [A]
time = 0.05, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$-\frac{F^a(c+dx)^{11}\text{Gamma}\left(\frac{11}{2},-b\log(F)(c+dx)^2\right)}{2d\left(-b\log(F)(c+dx)^2\right)^{11/2}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x)^10,x]
```

```
[Out] -1/2*(F^a*(c + d*x)^11*Gamma[11/2, -(b*(c + d*x)^2*Log[F])])/(d*(-(b*(c + d
*x)^2*Log[F]))^(11/2))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)^{10}\,dx=-\frac{F^a(c+dx)^{11}\Gamma\left(\frac{11}{2},-b(c+dx)^2\log(F)\right)}{2d\left(-b(c+dx)^2\log(F)\right)^{11/2}}$$

Mathematica [A]
time = 0.45, size = 49, normalized size = 1.00

$$-\frac{F^a(c+dx)^{11}\Gamma\left(\frac{11}{2},-b(c+dx)^2\log(F)\right)}{2d\left(-b(c+dx)^2\log(F)\right)^{11/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x)^10,x]
```

```
[Out] -1/2*(F^a*(c + d*x)^11*Gamma[11/2, -(b*(c + d*x)^2*Log[F])])/(d*(-(b*(c + d
*x)^2*Log[F]))^(11/2))
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 1358 vs. 2(606) = 1212.
time = 0.20, size = 1359, normalized size = 27.73

method	result
risch	$-\frac{315 d^3 c^3 x^4 F^{b\,d^2 x^2} F^{2bcdx} F^{b\,c^2} F^a}{4\ln(F)^2 b^2}+\frac{315 d\,c^3 x^2 F^{b\,d^2 x^2} F^{2bcdx} F^{b\,c^2} F^a}{4\ln(F)^3 b^3}-\frac{189 d^4 c^2 x^5 F^{b\,d^2 x^2} F^{2bcdx} F^{b\,c^2} F^a}{4\ln(F)^2 b^2}+\frac{315 d^2 c^2 x^3 F^{b\,d^2 x}}{4\ln(}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)*(d*x+c)^10,x,method=_RETURNVERBOSE)
```

```
[Out] -315/4*d^3*c^3/ln(F)^2/b^2*x^4*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+31
5/4*d*c^3/ln(F)^3/b^3*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-189/4*d
^4*c^2/ln(F)^2/b^2*x^5*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+315/4*d^2*
c^2/ln(F)^3/b^3*x^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+18*d^6*c^2/ln
(F)/b*x^7*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+63*d^4*c^4/ln(F)/b*x^5*
F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+63*d^3*c^5/ln(F)/b*x^4*F^(b*d^2*x
^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+42*d^2*c^6/ln(F)/b*x^3*F^(b*d^2*x^2)*F^(2*b
```

```
*c*d*x)*F^(b*c^2)*F^a+42*d^5*c^3/ln(F)/b*x^6*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^
(b*c^2)*F^a+945/64/d/ln(F)^5/b^5*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(-d*(-b*l
n(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))+945/32/ln(F)^5/b^5*x*F^(b*d^2*x^2
)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+18*d*c^7/ln(F)/b*x^2*F^(b*d^2*x^2)*F^(2*b*c*d
*x)*F^(b*c^2)*F^a-189/4*d*c^5/ln(F)^2/b^2*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F
^(b*c^2)*F^a-315/4*d^2*c^4/ln(F)^2/b^2*x^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b
*c^2)*F^a-63/4*d^5*c/ln(F)^2/b^2*x^6*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*
F^a+315/8*d^3*c/ln(F)^3/b^3*x^4*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-9
45/16*d*c/ln(F)^4/b^4*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+9/2*d^7
*c/ln(F)/b*x^8*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+63/8*d^4/ln(F)^3/b
^3*x^5*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-315/16*d^2/ln(F)^4/b^4*x^3
*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-9/4*d^6/ln(F)^2/b^2*x^7*F^(b*d^2
*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+1/2*d^8/ln(F)/b*x^9*F^(b*d^2*x^2)*F^(2*b*
c*d*x)*F^(b*c^2)*F^a+945/32/d*c/ln(F)^5/b^5*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(
b*c^2)*F^a-315/16/d*c^3/ln(F)^4/b^4*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F
^a+1/2/d*c^9/ln(F)/b*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-9/4/d*c^7/ln
(F)^2/b^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+63/8/d*c^5/ln(F)^3/b^3*
F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+9/2*c^8/ln(F)/b*x*F^(b*d^2*x^2)*F
^(2*b*c*d*x)*F^(b*c^2)*F^a-63/4*c^6/ln(F)^2/b^2*x*F^(b*d^2*x^2)*F^(2*b*c*d*
x)*F^(b*c^2)*F^a-945/16*c^2/ln(F)^4/b^4*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*
c^2)*F^a+315/8*c^4/ln(F)^3/b^3*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 4471 vs. $2(586) = 1172$.
time = 1.19, size = 4471, normalized size = 91.24

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^10,x, algorithm="maxima")
```

```
[Out] -5*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*d)
)*F^a*c^9/sqrt(b*log(F)) + 45/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(erf(sq
rt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2)*d^
3*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2/(b*
d^2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma(3/2
, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(-(b*
d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*c^8*d/sqrt(b*log(F)) - 60*(sqr
t(pi)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^
2))) - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(
b*d^2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/((b*log(F))^(
7/2)*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d
```

```
^2))^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^2/((
b*log(F))^(7/2)*d^3))*F^a*c^7*d^2/sqrt(b*log(F)) + 105*(sqrt(pi)*(b*d^2*x +
 b*c*d)*b^4*c^4*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)
^5/((b*log(F))^(9/2)*d^5*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 4*F^(
(b*d^2*x + b*c*d)^2/(b*d^2))*b^4*c^3*log(F)^4/((b*log(F))^(9/2)*d^4) - 6*(b
*d^2*x + b*c*d)^3*b^2*c^2*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*l
og(F)^5/((b*log(F))^(9/2)*d^7*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2))
+ 4*b^3*c*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F)
)^(9/2)*d^4) - (b*d^2*x + b*c*d)^5*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(
b*d^2))*log(F)^5/((b*log(F))^(9/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2)
)^(5/2)))*F^a*c^6*d^3/sqrt(b*log(F)) - 126*(sqrt(pi)*(b*d^2*x + b*c*d)*b^5*
c^5*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^6/((b*log(F
))^(11/2)*d^6*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 5*F^((b*d^2*x +
b*c*d)^2/(b*d^2))*b^5*c^4*log(F)^5/((b*log(F))^(11/2)*d^5) - 10*(b*d^2*x +
b*c*d)^3*b^3*c^3*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/(
(b*log(F))^(11/2)*d^8*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 10*b^4
*c^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(11
/2)*d^5) - b^3*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*l
og(F))^(11/2)*d^5) - 5*(b*d^2*x + b*c*d)^5*b*c*gamma(5/2, -(b*d^2*x + b*c*d
)^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(11/2)*d^10*(-(b*d^2*x + b*c*d)^2*
log(F)/(b*d^2))^(5/2)))*F^a*c^5*d^4/sqrt(b*log(F)) + 105*(sqrt(pi)*(b*d^2*x
 + b*c*d)*b^6*c^6*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(
F)^7/((b*log(F))^(13/2)*d^7*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 6*
F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^6*c^5*log(F)^6/((b*log(F))^(13/2)*d^6) -
15*(b*d^2*x + b*c*d)^3*b^4*c^4*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^
2))*log(F)^7/((b*log(F))^(13/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(
3/2)) + 20*b^5*c^3*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/(
(b*log(F))^(13/2)*d^6) - 6*b^4*c*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^
2))*log(F)^4/((b*log(F))^(13/2)*d^6) - 15*(b*d^2*x + b*c*d)^5*b^2*c^2*gamma
(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^11
*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) - (b*d^2*x + b*c*d)^7*gamma(7
/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^13*(
-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)))*F^a*c^4*d^5/sqrt(b*log(F)) - 6
0*(sqrt(pi)*(b*d^2*x + b*c*d)*b^7*c^7*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)
/(b*d^2))) - 1)*log(F)^8/((b*log(F))^(15/2)*d^8*sqrt(-(b*d^2*x + b*c*d)^2*l
og(F)/(b*d^2))) - 7*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^7*c^6*log(F)^7/((b*lo
g(F))^(15/2)*d^7) - 21*(b*d^2*x + b*c*d)^3*b^5*c^5*gamma(3/2, -(b*d^2*x + b
*c*d)^2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(15/2)*d^10*(-(b*d^2*x + b*c*d
)^2*log(F)/(b*d^2))^(3/2)) + 35*b^6*c^4*gamma(2, -(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))*log(F)^6/((b*log(F))^(15/2)*d^7) - 21*b^5*c^2*gamma(3, -(b*d^2*x
 + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(15/2)*d^7) - 35*(b*d^2*x
+ b*c*d)^5*b^3*c^3*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^8
/((b*log(F))^(15/2)*d^12*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) + b^4
*gamma(4, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(15/2)*
d^7) - 7*(b*d^2*x + b*c*d)^7*b*c*gamma(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*
```

```
d^2))*log(F)^8/((b*log(F))^(15/2)*d^14*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2)
)^(7/2)))*F^a*c^3*d^6/sqrt(b*log(F)) + 45/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^8
*c^8*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^9/((b*log(
F))^(17/2)*d^9*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 8*F^((b*d^2*x +
 b*c*d)^2/(b*d^2))*b^8*c^7*log(F)^8/((b*log(F))^(17/2)*d^8) - 28*(b*d^2*x +
 b*c*d)^3*b^6*c^6*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^9/
((b*log(F))^(17/2)*d^11*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 56*b
^7*c^5*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*...
```

Fricas [A]
time = 0.09, size = 456, normalized size = 9.31

$$\frac{945\sqrt{\pi}\sqrt{-bd^2\log(F)}F^a\operatorname{erf}\left(\frac{\sqrt{-bd^2\log(F)}(dx+c)}{d}\right)+2\left(16\left(b^5d^{10}x^9+9b^5cd^9x^8+36b^5c^2d^8x^7+84b^5c^3d^7x^6+126b^5c^4d^6x^5+126b^5c^5d^5x^4+84b^5c^6d^4x^3+36b^5c^7d^3x^2+9b^5c^8d^2x+b^5c^9d\right)\log(F)^5-72\left(b^4d^8x^7+7b^4cd^7x^6+21b^4c^2d^6x^5+35b^4c^3d^5x^4+35b^4c^4d^4x^3+21b^4c^5d^3x^2+7b^4c^6d^2x+b^4c^7d\right)\log(F)^4+252\left(b^3d^6x^5+5b^3cd^5x^4+10b^3c^2d^4x^3+10b^3c^3d^3x^2+5b^3c^4d^2x+b^3c^5d\right)\log(F)^3-630\left(b^2d^4x^3+3b^2cd^3x^2+3b^2c^2d^2x+b^2c^3d\right)\log(F)^2+945\left(bd^2x+bcd\right)\log(F)\right)F^{bd^2x^2+2bcdx+bc^2+a}}{64b^6d^2\log(F)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^10,x, algorithm="fricas")
```

```
[Out] 1/64*(945*sqrt(pi)*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^2*log(F))*(d*x + c
)/d) + 2*(16*(b^5*d^10*x^9 + 9*b^5*c*d^9*x^8 + 36*b^5*c^2*d^8*x^7 + 84*b^5*
c^3*d^7*x^6 + 126*b^5*c^4*d^6*x^5 + 126*b^5*c^5*d^5*x^4 + 84*b^5*c^6*d^4*x^
3 + 36*b^5*c^7*d^3*x^2 + 9*b^5*c^8*d^2*x + b^5*c^9*d)*log(F)^5 - 72*(b^4*d^
8*x^7 + 7*b^4*c*d^7*x^6 + 21*b^4*c^2*d^6*x^5 + 35*b^4*c^3*d^5*x^4 + 35*b^4*
c^4*d^4*x^3 + 21*b^4*c^5*d^3*x^2 + 7*b^4*c^6*d^2*x + b^4*c^7*d)*log(F)^4 +
252*(b^3*d^6*x^5 + 5*b^3*c*d^5*x^4 + 10*b^3*c^2*d^4*x^3 + 10*b^3*c^3*d^3*x^
2 + 5*b^3*c^4*d^2*x + b^3*c^5*d)*log(F)^3 - 630*(b^2*d^4*x^3 + 3*b^2*c*d^3*
x^2 + 3*b^2*c^2*d^2*x + b^2*c^3*d)*log(F)^2 + 945*(b*d^2*x + b*c*d)*log(F))
*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a))/(b^6*d^2*log(F)^6)
```

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

$$\int F^{a+b(c+dx)^2}(c+dx)^{10}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c)**10,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)*(c + d*x)**10, x)
```

Giac [A]
time = 1.78, size = 174, normalized size = 3.55

$$\frac{\left(16\,b^4d^8\left(x+\frac{c}{d}\right)^9\log(F)^4-72\,b^3d^6\left(x+\frac{c}{d}\right)^7\log(F)^3+252\,b^2d^4\left(x+\frac{c}{d}\right)^5\log(F)^2-630\,bd^2\left(x+\frac{c}{d}\right)^3\log(F)+945\,x+\frac{945\,c}{d}\right)e^{\left(bd^2x^2\log(F)+2\,bcdx\log(F)+bc^2\log(F)+a\log(F)\right)}}{32\,b^5\log(F)^5}+\frac{945\,\sqrt{\pi}\,F^a\operatorname{erf}\left(-\sqrt{-b\log(F)}\,d\left(x+\frac{c}{d}\right)\right)}{64\,\sqrt{-b\log(F)}\,b^5d\log(F)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^10,x, algorithm="giac")
```

```
[Out] 1/32*(16*b^4*d^8*(x + c/d)^9*log(F)^4 - 72*b^3*d^6*(x + c/d)^7*log(F)^3 + 2
52*b^2*d^4*(x + c/d)^5*log(F)^2 - 630*b*d^2*(x + c/d)^3*log(F) + 945*x + 94
5*c/d)*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^2*log(F) + a*log(F))/(b
^5*log(F)^5) + 945/64*sqrt(pi)*F^a*erf(-sqrt(-b*log(F))*d*(x + c/d))/(sqrt(
-b*log(F))*b^5*d*log(F)^5)
```

Mupad [B]
time = 4.13, size = 730, normalized size = 14.90

$$\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,\left(\frac{b^4\,c^9\,\ln\left(F\right)^4}{2}-\frac{9\,b^3\,c^7\,\ln\left(F\right)^3}{4}+\frac{63\,b^2\,c^5\,\ln\left(F\right)^2}{8}-\frac{315\,b\,c^3\,\ln\left(F\right)}{16}+\frac{945\,c}{32}\right)}{b^5\,d\,{\ln\left(F\right)}^5}-\frac{945\,F^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln\left(F\right)\,d^2+b\,c\,\ln\left(F\right)\,d}{\sqrt{b\,d^2\,\ln\left(F\right)}}\right)}{64\,b^5\,{\ln\left(F\right)}^5\,\sqrt{b\,d^2\,\ln\left(F\right)}}+\frac{63\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,x^4\,\left(8\,b^2\,c^5\,d^3\,{\ln\left(F\right)}^2-10\,b\,c^3\,d^3\,\ln\left(F\right)+5\,c\,d^3\right)}{8\,b^3\,{\ln\left(F\right)}^3}+\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,d^8\,x^9}{2\,b\,\ln\left(F\right)}-\frac{9\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,x^2\,\left(-32\,d\,b^3\,c^7\,{\ln\left(F\right)}^3+84\,d\,b^2\,c^5\,{\ln\left(F\right)}^2-140\,d\,b\,c^3\,\ln\left(F\right)+105\,d\,c\right)}{16\,b^4\,{\ln\left(F\right)}^4}+\frac{63\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,x^5\,\left(8\,b^2\,c^4\,d^4\,{\ln\left(F\right)}^2-6\,b\,c^2\,d^4\,\ln\left(F\right)+d^4\right)}{8\,b^3\,{\ln\left(F\right)}^3}-\frac{21\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,x^6\,\left(3\,c\,d^5-8\,b\,c^3\,d^5\,\ln\left(F\right)\right)}{4\,b^2\,{\ln\left(F\right)}^2}-\frac{21\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,x^3\,\left(-32\,b^3\,c^6\,d^2\,{\ln\left(F\right)}^3+60\,b^2\,c^4\,d^2\,{\ln\left(F\right)}^2-60\,b\,c^2\,d^2\,\ln\left(F\right)+15\,d^2\right)}{16\,b^4\,{\ln\left(F\right)}^4}+\frac{9\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,x\,\left(16\,b^4\,c^8\,{\ln\left(F\right)}^4-56\,b^3\,c^6\,{\ln\left(F\right)}^3+140\,b^2\,c^4\,{\ln\left(F\right)}^2-210\,b\,c^2\,\ln\left(F\right)+105\right)}{32\,b^5\,{\ln\left(F\right)}^5}+\frac{9\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,c\,d^7\,x^8}{2\,b\,\ln\left(F\right)}+\frac{9\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,d^6\,x^7\,\left(8\,b\,c^2\,\ln\left(F\right)-1\right)}{4\,b^2\,{\ln\left(F\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x)^10,x)
```

```
[Out] (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*((945*c)/32 - (315*b*c^3*log(F))
/16 + (63*b^2*c^5*log(F)^2)/8 - (9*b^3*c^7*log(F)^3)/4 + (b^4*c^9*log(F)^4)
/2))/(b^5*d*log(F)^5) - (945*F^a*pi^(1/2)*erfi((b*c*d*log(F) + b*d^2*x*log(
F))/(b*d^2*log(F))^(1/2)))/(64*b^5*log(F)^5*(b*d^2*log(F))^(1/2)) + (63*F^(
b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*x^4*(5*c*d^3 + 8*b^2*c^5*d^3*log(F)^
2 - 10*b*c^3*d^3*log(F)))/(8*b^3*log(F)^3) + (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F
^(2*b*c*d*x)*d^8*x^9)/(2*b*log(F)) - (9*F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*
c*d*x)*x^2*(105*c*d + 84*b^2*c^5*d*log(F)^2 - 32*b^3*c^7*d*log(F)^3 - 140*b
*c^3*d*log(F)))/(16*b^4*log(F)^4) + (63*F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*
c*d*x)*x^5*(d^4 + 8*b^2*c^4*d^4*log(F)^2 - 6*b*c^2*d^4*log(F)))/(8*b^3*log(
F)^3) - (21*F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*x^6*(3*c*d^5 - 8*b*c^
3*d^5*log(F)))/(4*b^2*log(F)^2) - (21*F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*
d*x)*x^3*(15*d^2 + 60*b^2*c^4*d^2*log(F)^2 - 32*b^3*c^6*d^2*log(F)^3 - 60*b
*c^2*d^2*log(F)))/(16*b^4*log(F)^4) + (9*F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b
*c*d*x)*x*(140*b^2*c^4*log(F)^2 - 210*b*c^2*log(F) - 56*b^3*c^6*log(F)^3 +
16*b^4*c^8*log(F)^4 + 105))/(32*b^5*log(F)^5) + (9*F^(b*d^2*x^2)*F^a*F^(b*c
^2)*F^(2*b*c*d*x)*c*d^7*x^8)/(2*b*log(F)) + (9*F^(b*d^2*x^2)*F^a*F^(b*c^2)*
F^(2*b*c*d*x)*d^6*x^7*(8*b*c^2*log(F) - 1))/(4*b^2*log(F)^2)
```

3.269 $\int F^{a+b(c+dx)^2}(c+dx)^8\,dx$

Optimal. Leaf size=179

$$\frac{105F^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{32b^{9/2}d\log^{\frac{9}{2}}(F)}-\frac{105F^{a+b(c+dx)^2}(c+dx)}{16b^4d\log^4(F)}+\frac{35F^{a+b(c+dx)^2}(c+dx)^3}{8b^3d\log^3(F)}-\frac{7F^{a+b(c+dx)^2}(c+\ldots}{4b^2d\log^2(F\ldots}$$

```
[Out] -105/16*F^(a+b*(d*x+c)^2)*(d*x+c)/b^4/d/ln(F)^4+35/8*F^(a+b*(d*x+c)^2)*(d*x
+c)^3/b^3/d/ln(F)^3-7/4*F^(a+b*(d*x+c)^2)*(d*x+c)^5/b^2/d/ln(F)^2+1/2*F^(a+
b*(d*x+c)^2)*(d*x+c)^7/b/d/ln(F)+105/32*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2
))*Pi^(1/2)/b^(9/2)/d/ln(F)^(9/2)
```

Rubi [A]
time = 0.23, antiderivative size = 179, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2243, 2235}

$$\frac{105\sqrt{\pi}\,F^a\text{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{32b^{9/2}d\log^{\frac{9}{2}}(F)}-\frac{105(c+dx)F^{a+b(c+dx)^2}}{16b^4d\log^4(F)}+\frac{35(c+dx)^3F^{a+b(c+dx)^2}}{8b^3d\log^3(F)}-\frac{7(c+dx)^5F^{a+b(c+dx)^2}}{4b^2d\log^2(F)}+\frac{(c+dx)^7F^{a+b(c+dx)^2}}{2bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x)^8,x]
```

```
[Out] (105*F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(32*b^(9/2)*d*Log[F
]^(9/2)) - (105*F^(a + b*(c + d*x)^2)*(c + d*x))/(16*b^4*d*Log[F]^4) + (35*
F^(a + b*(c + d*x)^2)*(c + d*x)^3)/(8*b^3*d*Log[F]^3) - (7*F^(a + b*(c + d*
x)^2)*(c + d*x)^5)/(4*b^2*d*Log[F]^2) + (F^(a + b*(c + d*x)^2)*(c + d*x)^7)
/(2*b*d*Log[F])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)^8\,dx = \frac{F^{a+b(c+dx)^2}(c+dx)^7}{2bd\log(F)} - \frac{7\int F^{a+b(c+dx)^2}(c+dx)^6\,dx}{2b\log(F)}$$
$$= -\frac{7F^{a+b(c+dx)^2}(c+dx)^5}{4b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^2}(c+dx)^7}{2bd\log(F)} + \frac{35\int F^{a+b(c+dx)^2}(c+dx)^4\,dx}{4b^2\log^2(F)}$$
$$= \frac{35F^{a+b(c+dx)^2}(c+dx)^3}{8b^3d\log^3(F)} - \frac{7F^{a+b(c+dx)^2}(c+dx)^5}{4b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^2}(c+dx)^7}{2bd\log(F)} - \frac{105\int}{}$$
$$= -\frac{105F^{a+b(c+dx)^2}(c+dx)}{16b^4d\log^4(F)} + \frac{35F^{a+b(c+dx)^2}(c+dx)^3}{8b^3d\log^3(F)} - \frac{7F^{a+b(c+dx)^2}(c+dx)^5}{4b^2d\log^2(F)} +$$
$$= \frac{105F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{32b^{9/2}d\log^{\frac{9}{2}}(F)} - \frac{105F^{a+b(c+dx)^2}(c+dx)}{16b^4d\log^4(F)} + \frac{35F^{a+b(c+}}{8b^3d}$$

Mathematica [A]
time = 0.57, size = 153, normalized size = 0.85

$$\frac{F^a\left(16F^{b(c+dx)^2}(c+dx)^7 + \frac{105\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{b^{7/2}\log^{\frac{7}{2}}(F)} - \frac{210F^{b(c+dx)^2}(c+dx)}{b^3\log^3(F)} + \frac{140F^{b(c+dx)^2}(c+dx)^3}{b^2\log^2(F)} - \frac{56F^{b(c+dx)^2}(c+dx)^5}{b\log(F)}\right)}{32bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x)^8,x]
```

```
[Out] (F^a*(16*F^(b*(c + d*x)^2)*(c + d*x)^7 + (105*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*
x)*Sqrt[Log[F]]])/(b^(7/2)*Log[F]^(7/2)) - (210*F^(b*(c + d*x)^2)*(c + d*x)
)/(b^3*Log[F]^3) + (140*F^(b*(c + d*x)^2)*(c + d*x)^3)/(b^2*Log[F]^2) - (56
*F^(b*(c + d*x)^2)*(c + d*x)^5)/(b*Log[F])))/(32*b*d*Log[F])
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 913 vs. 2(159) = 318.
time = 0.15, size = 914, normalized size = 5.11

method	result
risch	$-\frac{105\sqrt{\pi}\,F^a\,\mathrm{erf}\left(-d\sqrt{-b\ln(F)}\,x+\frac{bc\ln(F)}{\sqrt{-b\ln(F)}}\right)}{32d\ln(F)^4b^4\sqrt{-b\ln(F)}} - \frac{105x\,F^{b\,d^2x^2}F^{2bcdx}F^{b\,c^2}F^a}{16\ln(F)^4b^4} + \frac{d^6x^7F^{b\,d^2x^2}F^{2bcdx}F^{b\,c^2}F^a}{2\ln(F)b} +$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)*(d*x+c)^8,x,method=_RETURNVERBOSE)
```

```
[Out] -105/32/d/ln(F)^4/b^4*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)
*x+b*c*ln(F)/(-b*ln(F))^(1/2))-105/16/ln(F)^4/b^4*x*F^(b*d^2*x^2)*F^(2*b*c*
d*x)*F^(b*c^2)*F^a+1/2*d^6/ln(F)/b*x^7*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2
)*F^a+35/8*d^2/ln(F)^3/b^3*x^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+7/
2*c^6/ln(F)/b*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-35/4*c^4/ln(F)^2/
b^2*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+105/8*c^2/ln(F)^3/b^3*x*F^(
b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+1/2/d*c^7/ln(F)/b*F^(b*d^2*x^2)*F^(2
*b*c*d*x)*F^(b*c^2)*F^a-7/4/d*c^5/ln(F)^2/b^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F
^(b*c^2)*F^a+35/8/d*c^3/ln(F)^3/b^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F
^a-105/16/d*c/ln(F)^4/b^4*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-7/4*d^4
/ln(F)^2/b^2*x^5*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+21/2*d^4*c^2/ln(
F)/b*x^5*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+35/2*d^3*c^3/ln(F)/b*x^4
*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+35/2*d^2*c^4/ln(F)/b*x^3*F^(b*d^
2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+21/2*d*c^5/ln(F)/b*x^2*F^(b*d^2*x^2)*F^(
2*b*c*d*x)*F^(b*c^2)*F^a-35/2*d*c^3/ln(F)^2/b^2*x^2*F^(b*d^2*x^2)*F^(2*b*c*
d*x)*F^(b*c^2)*F^a-35/2*d^2*c^2/ln(F)^2/b^2*x^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)
*F^(b*c^2)*F^a-35/4*d^3*c/ln(F)^2/b^2*x^4*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*
c^2)*F^a+7/2*d^5*c/ln(F)/b*x^6*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+10
5/8*d*c/ln(F)^3/b^3*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a
```

Maxima [**B**] Leaf count of result is larger than twice the leaf count of optimal. 3066 vs. $2(159) = 318$.
time = 1.13, size = 3066, normalized size = 17.13

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^8,x, algorithm="maxima")
```

```
[Out] -4*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*d)
)*F^a*c^7/sqrt(b*log(F)) + 14*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(erf(sqrt
(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2)*d^3*
sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2/(b*d^
2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma(3/2,
-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(-(b*d^
2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*c^6*d/sqrt(b*log(F)) - 28*(sqrt(
pi)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2)
)) - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*
d^2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/((b*log(F))^(7/
2)*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2
))^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^2/((b*
log(F))^(7/2)*d^3))*F^a*c^5*d^2/sqrt(b*log(F)) + 35*(sqrt(pi)*(b*d^2*x + b*
```

c*d)*b^4*c^4*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^5/
((b*log(F))^(9/2)*d^5*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 4*F^((b*
d^2*x + b*c*d)^2/(b*d^2))*b^4*c^3*log(F)^4/((b*log(F))^(9/2)*d^4) - 6*(b*d^
2*x + b*c*d)^3*b^2*c^2*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(
F)^5/((b*log(F))^(9/2)*d^7*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 4
*b^3*c*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(
9/2)*d^4) - (b*d^2*x + b*c*d)^5*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d
^2))*log(F)^5/((b*log(F))^(9/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(
5/2)))*F^a*c^4*d^3/sqrt(b*log(F)) - 28*(sqrt(pi)*(b*d^2*x + b*c*d)*b^5*c^5*
(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^6/((b*log(F))^(
11/2)*d^6*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 5*F^((b*d^2*x + b*c*
d)^2/(b*d^2))*b^5*c^4*log(F)^5/((b*log(F))^(11/2)*d^5) - 10*(b*d^2*x + b*c*
d)^3*b^3*c^3*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*l
og(F))^(11/2)*d^8*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 10*b^4*c^2
*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(11/2)*
d^5) - b^3*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F
))^(11/2)*d^5) - 5*(b*d^2*x + b*c*d)^5*b*c*gamma(5/2, -(b*d^2*x + b*c*d)^2*
log(F)/(b*d^2))*log(F)^6/((b*log(F))^(11/2)*d^10*(-(b*d^2*x + b*c*d)^2*log(
F)/(b*d^2))^(5/2)))*F^a*c^3*d^4/sqrt(b*log(F)) + 14*(sqrt(pi)*(b*d^2*x + b*
c*d)*b^6*c^6*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^7/
((b*log(F))^(13/2)*d^7*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 6*F^((b
*d^2*x + b*c*d)^2/(b*d^2))*b^6*c^5*log(F)^6/((b*log(F))^(13/2)*d^6) - 15*(b
*d^2*x + b*c*d)^3*b^4*c^4*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*l
og(F)^7/((b*log(F))^(13/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2))
 + 20*b^5*c^3*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*lo
g(F))^(13/2)*d^6) - 6*b^4*c*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*l
og(F)^4/((b*log(F))^(13/2)*d^6) - 15*(b*d^2*x + b*c*d)^5*b^2*c^2*gamma(5/2,
 -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^11*(-(b
*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) - (b*d^2*x + b*c*d)^7*gamma(7/2, -
(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^13*(-(b*d
^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)))*F^a*c^2*d^5/sqrt(b*log(F)) - 4*(sqr
t(pi)*(b*d^2*x + b*c*d)*b^7*c^7*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^
2))) - 1)*log(F)^8/((b*log(F))^(15/2)*d^8*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))) - 7*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^7*c^6*log(F)^7/((b*log(F))^
(15/2)*d^7) - 21*(b*d^2*x + b*c*d)^3*b^5*c^5*gamma(3/2, -(b*d^2*x + b*c*d)^
2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(15/2)*d^10*(-(b*d^2*x + b*c*d)^2*lo
g(F)/(b*d^2))^(3/2)) + 35*b^6*c^4*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d
^2))*log(F)^6/((b*log(F))^(15/2)*d^7) - 21*b^5*c^2*gamma(3, -(b*d^2*x + b*c
*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(15/2)*d^7) - 35*(b*d^2*x + b*c*
d)^5*b^3*c^3*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^8/((b*l
og(F))^(15/2)*d^12*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) + b^4*gamma
(4, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(15/2)*d^7) -
 7*(b*d^2*x + b*c*d)^7*b*c*gamma(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*
log(F)^8/((b*log(F))^(15/2)*d^14*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2
)))*F^a*c*d^6/sqrt(b*log(F)) + 1/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^8*c^8*(erf

```
(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^9/((b*log(F))^(17/2
)*d^9*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 8*F^((b*d^2*x + b*c*d)^2
/(b*d^2))*b^8*c^7*log(F)^8/((b*log(F))^(17/2)*d^8) - 28*(b*d^2*x + b*c*d)^3
*b^6*c^6*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^9/((b*log(F
))^(17/2)*d^11*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 56*b^7*c^5*ga
mma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log...
```

Fricas [**B**] Leaf count of result is larger than twice the leaf count of optimal. 323 vs. $2(159) = 318$.
time = 0.37, size = 323, normalized size = 1.80

$$-\frac{105\,\sqrt{\pi}\,\sqrt{-bd^2\log\left(F\right)}\,F^a\operatorname{erf}\left(\frac{\sqrt{-bd^2\log\left(F\right)}\,(dx+c)}{d}\right)-2\left(8\left(b^4d^8x^7+7\,b^4cd^7x^6+21\,b^4c^2d^6x^5+35\,b^4c^3d^5x^4+35\,b^4c^4d^4x^3+21\,b^4c^5d^3x^2+7\,b^4c^6d^2x+b^4c^7d\right)\log\left(F\right)^4-28\left(b^3d^6x^5+5\,b^3cd^5x^4+10\,b^3c^2d^4x^3+10\,b^3c^3d^3x^2+5\,b^3c^4d^2x+b^3c^5d\right)\log\left(F\right)^3+70\left(b^2d^4x^3+3\,b^2cd^3x^2+3\,b^2c^2d^2x+b^2c^3d\right)\log\left(F\right)^2-105\left(bd^2x+bcd\right)\log\left(F\right)\right)F^{bd^2x^2+2\,bcdx+bc^2+a}}{32\,b^5d^2\log\left(F\right)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^8,x, algorithm="fricas")
```

```
[Out] -1/32*(105*sqrt(pi)*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^2*log(F))*(d*x +
c)/d) - 2*(8*(b^4*d^8*x^7 + 7*b^4*c*d^7*x^6 + 21*b^4*c^2*d^6*x^5 + 35*b^4*c
^3*d^5*x^4 + 35*b^4*c^4*d^4*x^3 + 21*b^4*c^5*d^3*x^2 + 7*b^4*c^6*d^2*x + b^
4*c^7*d)*log(F)^4 - 28*(b^3*d^6*x^5 + 5*b^3*c*d^5*x^4 + 10*b^3*c^2*d^4*x^3
+ 10*b^3*c^3*d^3*x^2 + 5*b^3*c^4*d^2*x + b^3*c^5*d)*log(F)^3 + 70*(b^2*d^4*
x^3 + 3*b^2*c*d^3*x^2 + 3*b^2*c^2*d^2*x + b^2*c^3*d)*log(F)^2 - 105*(b*d^2*
x + b*c*d)*log(F))*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a))/(b^5*d^2*log(F)^5
)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^2}(c+dx)^8\ dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c)**8,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)*(c + d*x)**8, x)
```

Giac [**A**]
time = 2.46, size = 153, normalized size = 0.85

$$\frac{\left(8\,b^3d^6\left(x+\frac{c}{d}\right)^7\log\left(F\right)^3-28\,b^2d^4\left(x+\frac{c}{d}\right)^5\log\left(F\right)^2+70\,bd^2\left(x+\frac{c}{d}\right)^3\log\left(F\right)-105\,x-\frac{105\,c}{d}\right)e^{\left(bd^2x^2\log(F)+2\,bcdx\log(F)+bc^2\log(F)+a\log(F)\right)}}{16\,b^4\log\left(F\right)^4}-\frac{105\,\sqrt{\pi}\,F^a\operatorname{erf}\left(-\sqrt{-b\log\left(F\right)}\,d\left(x+\frac{c}{d}\right)\right)}{32\,\sqrt{-b\log\left(F\right)}\,b^4d\log\left(F\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^8,x, algorithm="giac")
```

```
[Out] 1/16*(8*b^3*d^6*(x + c/d)^7*log(F)^3 - 28*b^2*d^4*(x + c/d)^5*log(F)^2 + 70
*b*d^2*(x + c/d)^3*log(F) - 105*x - 105*c/d)*e^(b*d^2*x^2*log(F) + 2*b*c*d*
```

```
x*log(F) + b*c^2*log(F) + a*log(F))/(b^4*log(F)^4) - 105/32*sqrt(pi)*F^a*er
f(-sqrt(-b*log(F))*d*(x + c/d))/(sqrt(-b*log(F))*b^4*d*log(F)^4)
```

Mupad [B]
time = 3.91, size = 533, normalized size = 2.98

$$\frac{105\,F^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln(F)\,d^2+b\,c\,\ln(F)\,d}{\sqrt{b\,d^2\,\ln(F)}}\right)}{32\,b^4\,\ln(F)^4\,\sqrt{b\,d^2\,\ln(F)}}+\frac{7\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,x\,\left(8\,b^3\,c^6\,\ln(F)^3-20\,b^2\,c^4\,\ln(F)^2+30\,b\,c^2\,\ln(F)-15\right)}{16\,b^4\,\ln(F)^4}-\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,\left(-\frac{b^3\,c^7\,\ln(F)^3}{2}+\frac{7\,b^2\,c^5\,\ln(F)^2}{4}-\frac{35\,b\,c^3\,\ln(F)}{8}+\frac{105\,c}{16}\right)}{b^4\,d\,\ln(F)^4}+\frac{7\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,x^2\,\left(12\,d\,b^2\,c^5\,\ln(F)^2-20\,d\,b\,c^3\,\ln(F)+15\,d\,c\right)}{8\,b^3\,\ln(F)^3}+\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,d^6\,x^7}{2\,b\,\ln(F)}+\frac{35\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,x^3\,\left(4\,b^2\,c^4\,d^2\,\ln(F)^2-4\,b\,c^2\,d^2\,\ln(F)+d^2\right)}{8\,b^3\,\ln(F)^3}-\frac{35\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,x^4\,\left(c\,d^3-2\,b\,c^3\,d^3\,\ln(F)\right)}{4\,b^2\,\ln(F)^2}+\frac{7\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,c\,d^5\,x^6}{2\,b\,\ln(F)}+\frac{7\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,d^4\,x^5\,\left(6\,b\,c^2\,\ln(F)-1\right)}{4\,b^2\,\ln(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x)^8,x)
```

```
[Out] (105*F^a*pi^(1/2)*erfi((b*c*d*log(F) + b*d^2*x*log(F))/(b*d^2*log(F))^(1/2)
))/(32*b^4*log(F)^4*(b*d^2*log(F))^(1/2)) + (7*F^(b*d^2*x^2)*F^a*F^(b*c^2)*
F^(2*b*c*d*x)*x*(30*b*c^2*log(F) - 20*b^2*c^4*log(F)^2 + 8*b^3*c^6*log(F)^3
 - 15))/(16*b^4*log(F)^4) - (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*((10
5*c)/16 - (35*b*c^3*log(F))/8 + (7*b^2*c^5*log(F)^2)/4 - (b^3*c^7*log(F)^3)
/2))/(b^4*d*log(F)^4) + (7*F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*x^2*(1
5*c*d + 12*b^2*c^5*d*log(F)^2 - 20*b*c^3*d*log(F)))/(8*b^3*log(F)^3) + (F^(
b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*d^6*x^7)/(2*b*log(F)) + (35*F^(b*d^2
*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*x^3*(d^2 + 4*b^2*c^4*d^2*log(F)^2 - 4*b*c
^2*d^2*log(F)))/(8*b^3*log(F)^3) - (35*F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c
*d*x)*x^4*(c*d^3 - 2*b*c^3*d^3*log(F)))/(4*b^2*log(F)^2) + (7*F^(b*d^2*x^2)
*F^a*F^(b*c^2)*F^(2*b*c*d*x)*c*d^5*x^6)/(2*b*log(F)) + (7*F^(b*d^2*x^2)*F^a
*F^(b*c^2)*F^(2*b*c*d*x)*d^4*x^5*(6*b*c^2*log(F) - 1))/(4*b^2*log(F)^2)
```

3.270 $\int F^{a+b(c+dx)^2}(c+dx)^6\,dx$

Optimal. Leaf size=145

$$-\frac{15F^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{16b^{7/2}d\log^{\frac{7}{2}}(F)}+\frac{15F^{a+b(c+dx)^2}(c+dx)}{8b^3d\log^3(F)}-\frac{5F^{a+b(c+dx)^2}(c+dx)^3}{4b^2d\log^2(F)}+\frac{F^{a+b(c+dx)^2}(c+d}{2bd\log(F)}$$

```
[Out] 15/8*F^(a+b*(d*x+c)^2)*(d*x+c)/b^3/d/ln(F)^3-5/4*F^(a+b*(d*x+c)^2)*(d*x+c)^
3/b^2/d/ln(F)^2+1/2*F^(a+b*(d*x+c)^2)*(d*x+c)^5/b/d/ln(F)-15/16*F^a*erfi((d
*x+c)*b^(1/2)*ln(F)^(1/2))*Pi^(1/2)/b^(7/2)/d/ln(F)^(7/2)
```

Rubi [A]
time = 0.16, antiderivative size = 145, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2243, 2235}

$$-\frac{15\sqrt{\pi}\,F^a\text{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{16b^{7/2}d\log^{\frac{7}{2}}(F)}+\frac{15(c+dx)F^{a+b(c+dx)^2}}{8b^3d\log^3(F)}-\frac{5(c+dx)^3F^{a+b(c+dx)^2}}{4b^2d\log^2(F)}+\frac{(c+dx)^5F^{a+b(c+dx)^2}}{2bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x)^6,x]
```

```
[Out] (-15*F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(16*b^(7/2)*d*Log[F
]^(7/2)) + (15*F^(a + b*(c + d*x)^2)*(c + d*x))/(8*b^3*d*Log[F]^3) - (5*F^(
a + b*(c + d*x)^2)*(c + d*x)^3)/(4*b^2*d*Log[F]^2) + (F^(a + b*(c + d*x)^2)
*(c + d*x)^5)/(2*b*d*Log[F])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)^6\,dx = \frac{F^{a+b(c+dx)^2}(c+dx)^5}{2bd\log(F)} - \frac{5\int F^{a+b(c+dx)^2}(c+dx)^4\,dx}{2b\log(F)}$$
$$= -\frac{5F^{a+b(c+dx)^2}(c+dx)^3}{4b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^2}(c+dx)^5}{2bd\log(F)} + \frac{15\int F^{a+b(c+dx)^2}(c+dx)^2\,dx}{4b^2\log^2(F)}$$
$$= \frac{15F^{a+b(c+dx)^2}(c+dx)}{8b^3d\log^3(F)} - \frac{5F^{a+b(c+dx)^2}(c+dx)^3}{4b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^2}(c+dx)^5}{2bd\log(F)} - \frac{15\int F}{8b}$$
$$= -\frac{15F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{16b^{7/2}d\log^{\frac{7}{2}}(F)} + \frac{15F^{a+b(c+dx)^2}(c+dx)}{8b^3d\log^3(F)} - \frac{5F^{a+b(c+dx)}}{4b^2d\,\mathrm{lo}}$$

Mathematica [A]
time = 0.30, size = 126, normalized size = 0.87

$$\frac{F^a\left(8F^{b(c+dx)^2}(c+dx)^5 - \frac{15\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{b^{5/2}\log^{\frac{5}{2}}(F)} + \frac{30F^{b(c+dx)^2}(c+dx)}{b^2\log^2(F)} - \frac{20F^{b(c+dx)^2}(c+dx)^3}{b\log(F)}\right)}{16bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x)^6,x]
```

```
[Out] (F^a*(8*F^(b*(c + d*x)^2)*(c + d*x)^5 - (15*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)
*Sqrt[Log[F]]])/(b^(5/2)*Log[F]^(5/2)) + (30*F^(b*(c + d*x)^2)*(c + d*x))/(
b^2*Log[F]^2) - (20*F^(b*(c + d*x)^2)*(c + d*x)^3)/(b*Log[F])))/(16*b*d*Log
[F])
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 560 vs. 2(127) = 254.
time = 0.10, size = 561, normalized size = 3.87

method	result
risch	$\frac{5d^3cx^4F^{b\,d^2x^2}F^{2bcdx}F^{b\,c^2}F^a}{2\ln(F)b} + \frac{5d^2c^2x^3F^{b\,d^2x^2}F^{2bcdx}F^{b\,c^2}F^a}{\ln(F)b} + \frac{5d\,c^3x^2F^{b\,d^2x^2}F^{2bcdx}F^{b\,c^2}F^a}{\ln(F)b} - \frac{15dc\,x^2F^{b\,d^2x^2}F^{2bcdx}F^{b\,c^2}}{4\ln(F)^2b^2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)*(d*x+c)^6,x,method=_RETURNVERBOSE)
```

```
[Out] 5/2*d^3*c/ln(F)/b*x^4*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+5*d^2*c^2/l
n(F)/b*x^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+5*d*c^3/ln(F)/b*x^2*F^
```

```
(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-15/4*d*c/ln(F)^2/b^2*x^2*F^(b*d^2*x
^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+1/2*d^4/ln(F)/b*x^5*F^(b*d^2*x^2)*F^(2*b*c*
d*x)*F^(b*c^2)*F^a+5/2*c^4/ln(F)/b*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*
F^a+1/2/d*c^5/ln(F)/b*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-5/4/d*c^3/l
n(F)^2/b^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-15/4*c^2/ln(F)^2/b^2*x
*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+15/8/d*c/ln(F)^3/b^3*F^(b*d^2*x^
2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-5/4*d^2/ln(F)^2/b^2*x^3*F^(b*d^2*x^2)*F^(2*b
*c*d*x)*F^(b*c^2)*F^a+15/8/ln(F)^3/b^3*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c
^2)*F^a+15/16/d/ln(F)^3/b^3*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))
^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 1922 vs. $2(127) = 254$.
time = 0.87, size = 1922, normalized size = 13.26

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^6,x, algorithm="maxima")
```

```
[Out] -3*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*d)
)*F^a*c^5/sqrt(b*log(F)) + 15/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(erf(sq
rt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2)*d^
3*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2/(b*
d^2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma(3/2
, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(-(b*
d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*c^4*d/sqrt(b*log(F)) - 10*(sqr
t(pi)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^
2))) - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(
b*d^2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/((b*log(F))^(
7/2)*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d
^2))^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^2/((
b*log(F))^(7/2)*d^3))*F^a*c^3*d^2/sqrt(b*log(F)) + 15/2*(sqrt(pi)*(b*d^2*x
+ b*c*d)*b^4*c^4*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F
)^5/((b*log(F))^(9/2)*d^5*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 4*F^
((b*d^2*x + b*c*d)^2/(b*d^2))*b^4*c^3*log(F)^4/((b*log(F))^(9/2)*d^4) - 6*(
b*d^2*x + b*c*d)^3*b^2*c^2*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*
log(F)^5/((b*log(F))^(9/2)*d^7*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2))
 + 4*b^3*c*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F
))^(9/2)*d^4) - (b*d^2*x + b*c*d)^5*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))*log(F)^5/((b*log(F))^(9/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2
))^(5/2)))*F^a*c^2*d^3/sqrt(b*log(F)) - 3*(sqrt(pi)*(b*d^2*x + b*c*d)*b^5*c
```

```
^5*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^6/((b*log(F)
)^(11/2)*d^6*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 5*F^((b*d^2*x + b
*c*d)^2/(b*d^2))*b^5*c^4*log(F)^5/((b*log(F))^(11/2)*d^5) - 10*(b*d^2*x + b
*c*d)^3*b^3*c^3*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((
b*log(F))^(11/2)*d^8*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 10*b^4*
c^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(11/
2)*d^5) - b^3*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*lo
g(F))^(11/2)*d^5) - 5*(b*d^2*x + b*c*d)^5*b*c*gamma(5/2, -(b*d^2*x + b*c*d)
^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(11/2)*d^10*(-(b*d^2*x + b*c*d)^2*l
og(F)/(b*d^2))^(5/2)))*F^a*c*d^4/sqrt(b*log(F)) + 1/2*(sqrt(pi)*(b*d^2*x +
b*c*d)*b^6*c^6*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^
7/((b*log(F))^(13/2)*d^7*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 6*F^(
(b*d^2*x + b*c*d)^2/(b*d^2))*b^6*c^5*log(F)^6/((b*log(F))^(13/2)*d^6) - 15*
(b*d^2*x + b*c*d)^3*b^4*c^4*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))
*log(F)^7/((b*log(F))^(13/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2
)) + 20*b^5*c^3*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*
log(F))^(13/2)*d^6) - 6*b^4*c*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))
*log(F)^4/((b*log(F))^(13/2)*d^6) - 15*(b*d^2*x + b*c*d)^5*b^2*c^2*gamma(5/
2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^11*(-
(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) - (b*d^2*x + b*c*d)^7*gamma(7/2,
 -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^13*(-(b
*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)))*F^a*d^5/sqrt(b*log(F)) + 1/2*sqrt
(pi)*F^(b*c^2 + a)*c^6*erf(sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt(-b*log(F))
)/(sqrt(-b*log(F))*F^(b*c^2)*d)
```

Fricas [A]
time = 0.35, size = 218, normalized size = 1.50

$$\frac{15\sqrt{\pi}\sqrt{-bd^2\log(F)}F^a\operatorname{erf}\left(\frac{\sqrt{-bd^2\log(F)}(dx+c)}{d}\right)+2\left(4\left(b^3d^6x^5+5b^3cd^5x^4+10b^3c^2d^4x^3+10b^3c^3d^3x^2+5b^3c^4d^2x+b^3c^5d\right)\log(F)^3-10\left(b^2d^4x^3+3b^2cd^3x^2+3b^2c^2d^2x+b^2c^3d\right)\log(F)^2+15\left(bd^2x+bcd\right)\log(F)\right)F^{bd^2x^2+2bcdx+bc^2+a}}{16b^4d^2\log(F)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^6,x, algorithm="fricas")
```

```
[Out] 1/16*(15*sqrt(pi)*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^2*log(F))*(d*x + c)
/d) + 2*(4*(b^3*d^6*x^5 + 5*b^3*c*d^5*x^4 + 10*b^3*c^2*d^4*x^3 + 10*b^3*c^3
*d^3*x^2 + 5*b^3*c^4*d^2*x + b^3*c^5*d)*log(F)^3 - 10*(b^2*d^4*x^3 + 3*b^2*
c*d^3*x^2 + 3*b^2*c^2*d^2*x + b^2*c^3*d)*log(F)^2 + 15*(b*d^2*x + b*c*d)*lo
g(F))*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a))/(b^4*d^2*log(F)^4)
```

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

$$\int F^{a+b(c+dx)^2}(c+dx)^6\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c)**6,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)*(c + d*x)**6, x)
```

Giac [A]
time = 2.82, size = 132, normalized size = 0.91

$$\frac{\left(4\,b^2d^4\left(x+\frac{c}{d}\right)^5\log\left(F\right)^2-10\,bd^2\left(x+\frac{c}{d}\right)^3\log\left(F\right)+15\,x+\frac{15\,c}{d}\right)e^{\left(bd^2x^2\log(F)+2\,bcdx\log(F)+bc^2\log(F)+a\log(F)\right)}}{8\,b^3\log\left(F\right)^3}+\frac{15\,\sqrt{\pi}\,F^a\,\mathrm{erf}\left(-\sqrt{-b\log\left(F\right)}\,d\left(x+\frac{c}{d}\right)\right)}{16\,\sqrt{-b\log\left(F\right)}\,b^3d\log\left(F\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^6,x, algorithm="giac")
```

```
[Out] 1/8*(4*b^2*d^4*(x + c/d)^5*log(F)^2 - 10*b*d^2*(x + c/d)^3*log(F) + 15*x +
15*c/d)*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^2*log(F) + a*log(F))/(
b^3*log(F)^3) + 15/16*sqrt(pi)*F^a*erf(-sqrt(-b*log(F))*d*(x + c/d))/(sqrt(
-b*log(F))*b^3*d*log(F)^3)
```

Mupad [B]
time = 3.77, size = 378, normalized size = 2.61

$$F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,\left(\frac{15\,c}{8\,b^3\,d\ln\left(F\right)^3}+\frac{c^5}{2\,b\,d\,\ln\left(F\right)}-\frac{5\,c^3}{4\,b^2\,d\ln\left(F\right)^2}\right)-\frac{15\,F^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln(F)\,d^2+b\,c\,\ln(F)\,d}{\sqrt{b\,d^2\,\ln\left(F\right)}}\right)}{16\,b^3\ln\left(F\right)^3\,\sqrt{b\,d^2\,\ln\left(F\right)}}-\frac{5\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,x^2\,\left(3\,c\,d-4\,b\,c^3\,d\,\ln\left(F\right)\right)}{4\,b^2\ln\left(F\right)^2}+\frac{5\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,x\,\left(4\,b^2\,c^4\ln\left(F\right)^2-6\,b\,c^2\,\ln\left(F\right)+3\right)}{8\,b^3\ln\left(F\right)^3}+\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,d^4\,x^5}{2\,b\,\ln\left(F\right)}+\frac{5\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,c\,d^3\,x^4}{2\,b\,\ln\left(F\right)}+\frac{5\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,d^2\,x^3\,\left(4\,b\,c^2\,\ln\left(F\right)-1\right)}{4\,b^2\ln\left(F\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x)^6,x)
```

```
[Out] F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*((15*c)/(8*b^3*d*log(F)^3) + c^5/
(2*b*d*log(F)) - (5*c^3)/(4*b^2*d*log(F)^2)) - (15*F^a*pi^(1/2)*erfi((b*c*d
*log(F) + b*d^2*x*log(F))/(b*d^2*log(F))^(1/2)))/(16*b^3*log(F)^3*(b*d^2*lo
g(F))^(1/2)) - (5*F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*x^2*(3*c*d - 4*
b*c^3*d*log(F)))/(4*b^2*log(F)^2) + (5*F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c
*d*x)*x*(4*b^2*c^4*log(F)^2 - 6*b*c^2*log(F) + 3))/(8*b^3*log(F)^3) + (F^(b
*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*d^4*x^5)/(2*b*log(F)) + (5*F^(b*d^2*x
^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*c*d^3*x^4)/(2*b*log(F)) + (5*F^(b*d^2*x^2)*
F^a*F^(b*c^2)*F^(2*b*c*d*x)*d^2*x^3*(4*b*c^2*log(F) - 1))/(4*b^2*log(F)^2)
```

3.271 $\int F^{a+b(c+dx)^2}(c+dx)^4\,dx$

Optimal. Leaf size=111

$$\frac{3F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{8b^{5/2}d\log^{\frac{5}{2}}(F)}-\frac{3F^{a+b(c+dx)^2}(c+dx)}{4b^2d\log^2(F)}+\frac{F^{a+b(c+dx)^2}(c+dx)^3}{2bd\log(F)}$$

```
[Out] -3/4*F^(a+b*(d*x+c)^2)*(d*x+c)/b^2/d/ln(F)^2+1/2*F^(a+b*(d*x+c)^2)*(d*x+c)^
3/b/d/ln(F)+3/8*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*Pi^(1/2)/b^(5/2)/d/ln
(F)^(5/2)
```

Rubi [A]
time = 0.11, antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2243, 2235}

$$\frac{3\sqrt{\pi}\,F^a\mathrm{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{8b^{5/2}d\log^{\frac{5}{2}}(F)}-\frac{3(c+dx)F^{a+b(c+dx)^2}}{4b^2d\log^2(F)}+\frac{(c+dx)^3F^{a+b(c+dx)^2}}{2bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x)^4,x]
```

```
[Out] (3*F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(8*b^(5/2)*d*Log[F]^(
5/2)) - (3*F^(a + b*(c + d*x)^2)*(c + d*x))/(4*b^2*d*Log[F]^2) + (F^(a + b*
(c + d*x)^2)*(c + d*x)^3)/(2*b*d*Log[F])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)^4\,dx = \frac{F^{a+b(c+dx)^2}(c+dx)^3}{2bd\log(F)} - \frac{3\int F^{a+b(c+dx)^2}(c+dx)^2\,dx}{2b\log(F)}$$
$$= -\frac{3F^{a+b(c+dx)^2}(c+dx)}{4b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^2}(c+dx)^3}{2bd\log(F)} + \frac{3\int F^{a+b(c+dx)^2}\,dx}{4b^2\log^2(F)}$$
$$= \frac{3F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{8b^{5/2}d\log^{\frac{5}{2}}(F)} - \frac{3F^{a+b(c+dx)^2}(c+dx)}{4b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^2}(c}{2bd\log(F}$$

Mathematica [A]
time = 0.24, size = 90, normalized size = 0.81

$$\frac{F^a\left(3\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)+2\sqrt{b}\,F^{b(c+dx)^2}(c+dx)\sqrt{\log(F)}\,(-3+2b(c+dx)^2\log(F))\right)}{8b^{5/2}d\log^{\frac{5}{2}}(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x)^4,x]
```

```
[Out] (F^a*(3*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]] + 2*Sqrt[b]*F^(b*(c +
 d*x)^2)*(c + d*x)*Sqrt[Log[F]]*(-3 + 2*b*(c + d*x)^2*Log[F])))/(8*b^(5/2)*
d*Log[F]^(5/2))
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 299 vs. 2(95) = 190.
time = 0.12, size = 300, normalized size = 2.70

method	result
risch	$\frac{d^2x^3F^{b\,d^2x^2}F^{2bcdx}F^{b\,c^2}F^a}{2\ln(F)b}+\frac{3dc\,x^2F^{b\,d^2x^2}F^{2bcdx}F^{b\,c^2}F^a}{2\ln(F)b}+\frac{3c^2x\,F^{b\,d^2x^2}F^{2bcdx}F^{b\,c^2}F^a}{2\ln(F)b}+\frac{c^3F^{b\,d^2x^2}F^{2bcdx}F^{b\,c^2}F^a}{2d\ln(F)b}-3c$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)*(d*x+c)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*d^2/ln(F)/b*x^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+3/2*d*c/ln(F)
/b*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+3/2*c^2/ln(F)/b*x*F^(b*d^2
*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+1/2/d*c^3/ln(F)/b*F^(b*d^2*x^2)*F^(2*b*c*
d*x)*F^(b*c^2)*F^a-3/4/d*c/ln(F)^2/b^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2
)*F^a-3/4/ln(F)^2/b^2*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-3/8/d/ln(
F)^2/b^2*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/
(-b*ln(F))^(1/2))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 1037 vs. $2(95) = 190$.
time = 0.63, size = 1037, normalized size = 9.34

$$-\frac{2\left(\frac{\sqrt{\pi}(bd^2x+bcd)bc\left(\operatorname{erf}\left(\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}\right)-1\right)\log(F)^2}{(b\log(F))^{\frac{3}{2}}d^2\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}}-\frac{F^{\frac{(bd^2x+bcd)^2}{bd^2}}b\log(F)}{(b\log(F))^{\frac{3}{2}}d}\right)F^ac^3}{\sqrt{b\log(F)}}+\frac{3\left(\frac{\sqrt{\pi}(bd^2x+bcd)b^2c^2\left(\operatorname{erf}\left(\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}\right)-1\right)\log(F)^3}{(b\log(F))^{\frac{5}{2}}d^3\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}}-\frac{2F^{\frac{(bd^2x+bcd)^2}{bd^2}}b^2c\log(F)^2}{(b\log(F))^{\frac{5}{2}}d^2}-\frac{(bd^2x+bcd)^3\Gamma\left(\frac{3}{2},-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)\log(F)^3}{(b\log(F))^{\frac{5}{2}}d^5\left(-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)^{\frac{3}{2}}}\right)F^ac^2d}{\sqrt{b\log(F)}}-\frac{2\left(\frac{\sqrt{\pi}(bd^2x+bcd)b^3c^3\left(\operatorname{erf}\left(\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}\right)-1\right)\log(F)^4}{(b\log(F))^{\frac{7}{2}}d^4\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}}-\frac{3F^{\frac{(bd^2x+bcd)^2}{bd^2}}b^3c^2\log(F)^3}{(b\log(F))^{\frac{7}{2}}d^3}-\frac{3(bd^2x+bcd)^3bc\Gamma\left(\frac{3}{2},-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)\log(F)^4}{(b\log(F))^{\frac{7}{2}}d^6\left(-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)^{\frac{3}{2}}}+\frac{b^2\Gamma\left(2,-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)\log(F)^2}{(b\log(F))^{\frac{7}{2}}d^3}\right)F^acd^2}{\sqrt{b\log(F)}}+\frac{\left(\frac{\sqrt{\pi}(bd^2x+bcd)b^4c^4\left(\operatorname{erf}\left(\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}\right)-1\right)\log(F)^5}{(b\log(F))^{\frac{9}{2}}d^5\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}}-\frac{4F^{\frac{(bd^2x+bcd)^2}{bd^2}}b^4c^3\log(F)^4}{(b\log(F))^{\frac{9}{2}}d^4}-\frac{6(bd^2x+bcd)^3b^2c^2\Gamma\left(\frac{3}{2},-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)\log(F)^5}{(b\log(F))^{\frac{9}{2}}d^7\left(-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)^{\frac{3}{2}}}+\frac{4b^3c\Gamma\left(2,-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)\log(F)^3}{(b\log(F))^{\frac{9}{2}}d^4}-\frac{(bd^2x+bcd)^5\Gamma\left(\frac{5}{2},-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)\log(F)^5}{(b\log(F))^{\frac{9}{2}}d^9\left(-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)^{\frac{5}{2}}}\right)F^ad^3}{2\sqrt{b\log(F)}}+\frac{\sqrt{\pi}F^{bc^2+a}c^4\operatorname{erf}\left(\sqrt{-b\log(F)}dx-\frac{bc\log(F)}{\sqrt{-b\log(F)}}\right)}{2\sqrt{-b\log(F)}F^{bc^2}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^4,x, algorithm="maxima")
```

```
[Out] -2*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*d)
)*F^a*c^3/sqrt(b*log(F)) + 3*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(erf(sqrt(
-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2)*d^3*s
qrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2/(b*d^2
))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma(3/2, -
(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(-(b*d^2
*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*c^2*d/sqrt(b*log(F)) - 2*(sqrt(pi
)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2)))
 - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^
2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/((b*log(F))^(7/2)
*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))
^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^2/((b*lo
g(F))^(7/2)*d^3))*F^a*c*d^2/sqrt(b*log(F)) + 1/2*(sqrt(pi)*(b*d^2*x + b*c*d
)*b^4*c^4*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^5/((b
*log(F))^(9/2)*d^5*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 4*F^((b*d^2
*x + b*c*d)^2/(b*d^2))*b^4*c^3*log(F)^4/((b*log(F))^(9/2)*d^4) - 6*(b*d^2*x
 + b*c*d)^3*b^2*c^2*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^
5/((b*log(F))^(9/2)*d^7*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 4*b^
3*c*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(9/2
)*d^4) - (b*d^2*x + b*c*d)^5*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2)
)*log(F)^5/((b*log(F))^(9/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2
)))*F^a*d^3/sqrt(b*log(F)) + 1/2*sqrt(pi)*F^(b*c^2 + a)*c^4*erf(sqrt(-b*log
(F))*d*x - b*c*log(F)/sqrt(-b*log(F)))/(sqrt(-b*log(F))*F^(b*c^2)*d)
```

Fricas [A]
time = 0.38, size = 141, normalized size = 1.27

$$-\frac{3\sqrt{\pi}\sqrt{-bd^2\log(F)}F^a\operatorname{erf}\left(\frac{\sqrt{-bd^2\log(F)}(dx+c)}{d}\right)-2\left(2\left(b^2d^4x^3+3b^2cd^3x^2+3b^2c^2d^2x+b^2c^3d\right)\log(F)^2-3\left(bd^2x+bcd\right)\log(F)\right)F^{bd^2x^2+2bcdx+bc^2+a}}{8b^3d^2\log(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] -1/8*(3*sqrt(pi)*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^2*log(F))*(d*x + c)/
d) - 2*(2*(b^2*d^4*x^3 + 3*b^2*c*d^3*x^2 + 3*b^2*c^2*d^2*x + b^2*c^3*d)*log
(F)^2 - 3*(b*d^2*x + b*c*d)*log(F))*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a))/
(b^3*d^2*log(F)^3)
```

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

$$\int F^{a+b(c+dx)^2}(c+dx)^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c)**4,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)*(c + d*x)**4, x)
```

Giac [A]
time = 3.15, size = 111, normalized size = 1.00

$$\frac{\left(2\,bd^2\left(x+\frac{c}{d}\right)^3\log\left(F\right)-3\,x-\frac{3\,c}{d}\right)e^{\left(bd^2x^2\log(F)+2\,bcdx\log(F)+bc^2\log(F)+a\log(F)\right)}}{4\,b^2\log\left(F\right)^2}-\frac{3\,\sqrt{\pi}\,F^a\,\mathrm{erf}\left(-\sqrt{-b\log\left(F\right)}\,d\left(x+\frac{c}{d}\right)\right)}{8\,\sqrt{-b\log\left(F\right)}\,b^2d\log\left(F\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^4,x, algorithm="giac")
```

```
[Out] 1/4*(2*b*d^2*(x + c/d)^3*log(F) - 3*x - 3*c/d)*e^(b*d^2*x^2*log(F) + 2*b*c*
d*x*log(F) + b*c^2*log(F) + a*log(F))/(b^2*log(F)^2) - 3/8*sqrt(pi)*F^a*erf
(-sqrt(-b*log(F))*d*(x + c/d))/(sqrt(-b*log(F))*b^2*d*log(F)^2)
```

Mupad [B]
time = 3.60, size = 243, normalized size = 2.19

$$\frac{3\,F^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln(F)\,d^2+b\,c\,\ln(F)\,d}{\sqrt{b\,d^2\,\ln\left(F\right)}}\right)}{8\,b^2\ln\left(F\right)^2\,\sqrt{b\,d^2\,\ln\left(F\right)}}-F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\left(\frac{3\,c}{4\,b^2\,d\ln\left(F\right)^2}-\frac{c^3}{2\,b\,d\,\ln\left(F\right)}\right)+\frac{3\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,x\left(2\,b\,c^2\,\ln\left(F\right)-1\right)}{4\,b^2\ln\left(F\right)^2}+\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,d^2\,x^3}{2\,b\,\ln\left(F\right)}+\frac{3\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,c\,d\,x^2}{2\,b\,\ln\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x)^4,x)
```

```
[Out] (3*F^a*pi^(1/2)*erfi((b*c*d*log(F) + b*d^2*x*log(F))/(b*d^2*log(F))^(1/2)))
/(8*b^2*log(F)^2*(b*d^2*log(F))^(1/2)) - F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b
*c*d*x)*((3*c)/(4*b^2*d*log(F)^2) - c^3/(2*b*d*log(F))) + (3*F^(b*d^2*x^2)*
F^a*F^(b*c^2)*F^(2*b*c*d*x)*x*(2*b*c^2*log(F) - 1))/(4*b^2*log(F)^2) + (F^(
b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*d^2*x^3)/(2*b*log(F)) + (3*F^(b*d^2*
x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*c*d*x^2)/(2*b*log(F))
```

3.272 $\int F^{a+b(c+dx)^2}(c+dx)^2\,dx$

Optimal. Leaf size=77

$$-\frac{F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{4b^{3/2}d\log^{\frac{3}{2}}(F)}+\frac{F^{a+b(c+dx)^2}(c+dx)}{2bd\log(F)}$$

```
[Out] 1/2*F^(a+b*(d*x+c)^2)*(d*x+c)/b/d/ln(F)-1/4*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^
(1/2))*Pi^(1/2)/b^(3/2)/d/ln(F)^(3/2)
```

Rubi [A]
time = 0.06, antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2243, 2235}

$$\frac{(c+dx)F^{a+b(c+dx)^2}}{2bd\log(F)}-\frac{\sqrt{\pi}\,F^a\mathrm{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{4b^{3/2}d\log^{\frac{3}{2}}(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x)^2,x]
```

```
[Out] -1/4*(F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(b^(3/2)*d*Log[F]^
(3/2)) + (F^(a + b*(c + d*x)^2)*(c + d*x))/(2*b*d*Log[F])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)^2\,dx = \frac{F^{a+b(c+dx)^2}(c+dx)}{2bd\log(F)} - \frac{\int F^{a+b(c+dx)^2}\,dx}{2b\log(F)}$$
$$= -\frac{F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{4b^{3/2}d\log^{\frac{3}{2}}(F)} + \frac{F^{a+b(c+dx)^2}(c+dx)}{2bd\log(F)}$$

Mathematica [A]
time = 0.18, size = 77, normalized size = 1.00

$$-\frac{F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{4b^{3/2}d\log^{\frac{3}{2}}(F)} + \frac{F^{a+b(c+dx)^2}(c+dx)}{2bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x)^2,x]
```

```
[Out] -1/4*(F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(b^(3/2)*d*Log[F]^
(3/2)) + (F^(a + b*(c + d*x)^2)*(c + d*x))/(2*b*d*Log[F])
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 130 vs. 2(63) = 126.
time = 0.09, size = 131, normalized size = 1.70

method	result	size
risch	$\frac{x\,F^{b\,d^2x^2}F^{2bcdx}F^{b\,c^2}F^a}{2\ln(F)b} + \frac{c\,F^{b\,d^2x^2}F^{2bcdx}F^{b\,c^2}F^a}{2d\ln(F)b} + \frac{\sqrt{\pi}\,F^a\,\mathrm{erf}\left(-d\sqrt{-b\ln(F)}\,x + \frac{bc\ln(F)}{\sqrt{-b\ln(F)}}\right)}{4d\ln(F)b\sqrt{-b\ln(F)}}$	131

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)*(d*x+c)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/ln(F)/b*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+1/2/d*c/ln(F)/b*F^(
b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+1/4/d/ln(F)/b*Pi^(1/2)*F^a/(-b*ln(F)
)^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 413 vs. 2(63) = 126.
time = 0.43, size = 413, normalized size = 5.36

$$-\frac{\left(\frac{\sqrt{\pi}\,(bd^2x+bcd)bc\left(\mathrm{erf}\left(\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}\right)-1\right)\log(F)^2}{(b\log(F))^{\frac{3}{2}}d^2\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}} - \frac{F^{\frac{(bd^2x+bcd)^2}{bd^2}}b\log(F)}{(b\log(F))^{\frac{3}{2}}d}\right)F^ac}{\sqrt{b\log(F)}} + \frac{\left(\frac{\sqrt{\pi}\,(bd^2x+bcd)b^2c^2\left(\mathrm{erf}\left(\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}\right)-1\right)\log(F)^3}{(b\log(F))^{\frac{5}{2}}d^3\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}} - \frac{2F^{\frac{(bd^2x+bcd)^2}{bd^2}}b^2c\log(F)^2}{(b\log(F))^{\frac{5}{2}}d^2} - \frac{(bd^2x+bcd)^3\Gamma\left(\frac{3}{2},-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)\log(F)^3}{(b\log(F))^{\frac{5}{2}}d^5\left(-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)^{\frac{3}{2}}}\right)F^ad}{2\sqrt{b\log(F)}} + \frac{\sqrt{\pi}\,F^{bc^2+a}c^2\,\mathrm{erf}\left(\sqrt{-b\log(F)}\,dx - \frac{bc\log(F)}{\sqrt{-b\log(F)}}\right)}{2\sqrt{-b\log(F)}\,F^{bc^2}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^2,x, algorithm="maxima")
```

```
[Out] -(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d
^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*d))*
F^a*c/sqrt(b*log(F)) + 1/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(erf(sqrt(-(
b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2)*d^3*sqr
t(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2/(b*d^2))
*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma(3/2, -(b
*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(-(b*d^2*x
 + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*d/sqrt(b*log(F)) + 1/2*sqrt(pi)*F^(
b*c^2 + a)*c^2*erf(sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt(-b*log(F)))/(sqrt(
-b*log(F))*F^(b*c^2)*d)
```

Fricas [A]
time = 0.36, size = 88, normalized size = 1.14

$$\frac{\sqrt{\pi}\sqrt{-bd^2\log(F)}\,F^a\operatorname{erf}\left(\frac{\sqrt{-bd^2\log(F)}\,(dx+c)}{d}\right)+2\,(bd^2x+bcd)F^{bd^2x^2+2\,bcdx+bc^2+a}\log(F)}{4\,b^2d^2\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] 1/4*(sqrt(pi)*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^2*log(F))*(d*x + c)/d)
+ 2*(b*d^2*x + b*c*d)*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)*log(F))/(b^2*d^
2*log(F)^2)
```

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

$$\int F^{a+b(c+dx)^2}(c+dx)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c)**2,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)*(c + d*x)**2, x)
```

Giac [A]
time = 2.34, size = 91, normalized size = 1.18

$$\frac{\left(x+\frac{c}{d}\right)e^{\left(bd^2x^2\log(F)+2\,bcdx\log(F)+bc^2\log(F)+a\log(F)\right)}}{2\,b\log(F)}+\frac{\sqrt{\pi}\,F^a\operatorname{erf}\left(-\sqrt{-b\log(F)}\,d\left(x+\frac{c}{d}\right)\right)}{4\,\sqrt{-b\log(F)}\,bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^2,x, algorithm="giac")
```

```
[Out] 1/2*(x + c/d)*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^2*log(F) + a*log
(F))/(b*log(F)) + 1/4*sqrt(pi)*F^a*erf(-sqrt(-b*log(F))*d*(x + c/d))/(sqrt(
-b*log(F))*b*d*log(F))
```

Mupad [B]
time = 3.59, size = 130, normalized size = 1.69

$$\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,x}{2\,b\,\ln\left(F\right)}-\frac{F^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln(F)\,d^2+b\,c\,\ln(F)\,d}{\sqrt{b\,d^2\,\ln\left(F\right)}}\right)}{4\,b\,\ln\left(F\right)\,\sqrt{b\,d^2\,\ln\left(F\right)}}+\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,c}{2\,b\,d\,\ln\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x)^2,x)
```

```
[Out] (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*x)/(2*b*log(F)) - (F^a*pi^(1/2)*
erfi((b*c*d*log(F) + b*d^2*x*log(F))/(b*d^2*log(F))^(1/2)))/(4*b*log(F)*(b*
d^2*log(F))^(1/2)) + (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*c)/(2*b*d*l
og(F))
```

3.273 $\int F^{a+b(c+dx)^2}\,dx$

Optimal. Leaf size=44

$$\frac{F^a\sqrt{\pi}\,\operatorname{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{2\sqrt{b}\,d\sqrt{\log(F)}}$$

```
[Out] 1/2*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*Pi^(1/2)/d/b^(1/2)/ln(F)^(1/2)
```

Rubi [A]
time = 0.01, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2235}

$$\frac{\sqrt{\pi}\,F^a\operatorname{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{2\sqrt{b}\,d\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2),x]
[Out] (F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(2*Sqrt[b]*d*Sqrt[Log[F
]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rubi steps

$$\int F^{a+b(c+dx)^2}\,dx = \frac{F^a\sqrt{\pi}\,\operatorname{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{2\sqrt{b}\,d\sqrt{\log(F)}}$$

Mathematica [A]
time = 0.05, size = 44, normalized size = 1.00

$$\frac{F^a\sqrt{\pi}\,\operatorname{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{2\sqrt{b}\,d\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2),x]
```

```
[Out] (F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(2*Sqrt[b]*d*Sqrt[Log[F
]])
```

Maple [A]
time = 0.02, size = 58, normalized size = 1.32

method	result	size
risch	$-\frac{\sqrt{\pi}\, F^{b\,c^{2}+a} F^{-b\,c^{2}} \operatorname{erf}\left(-d\sqrt{-b\ln\left(F\right)}\, x+\frac{b c \ln\left(F\right)}{\sqrt{-b\ln\left(F\right)}}\right)}{2 d \sqrt{-b\ln\left(F\right)}}$	58

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*Pi^(1/2)*F^(b*c^2+a)*F^(-b*c^2)/d/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(
1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))
```

Maxima [A]
time = 0.28, size = 58, normalized size = 1.32

$$\frac{\sqrt{\pi}\, F^{bc^2+a} \operatorname{erf}\left(\sqrt{-b\log\left(F\right)}\, dx-\frac{bc\log\left(F\right)}{\sqrt{-b\log\left(F\right)}}\right)}{2\,\sqrt{-b\log\left(F\right)}\, F^{bc^2} d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(pi)*F^(b*c^2 + a)*erf(sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt(-b*log
(F)))/(sqrt(-b*log(F))*F^(b*c^2)*d)
```

Fricas [A]
time = 0.39, size = 48, normalized size = 1.09

$$-\frac{\sqrt{\pi}\,\sqrt{-bd^2\log\left(F\right)}\, F^a \operatorname{erf}\left(\frac{\sqrt{-bd^2\log\left(F\right)}\,(dx+c)}{d}\right)}{2\,bd^2\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^2*log(F))*(d*x + c)/d)/
(b*d^2*log(F))
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2),x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2), x)
```

Giac [A]
time = 2.69, size = 36, normalized size = 0.82

$$-\frac{\sqrt{\pi}\,F^a\operatorname{erf}\left(-\sqrt{-b\log\left(F\right)}\,d\left(x+\frac{c}{d}\right)\right)}{2\,\sqrt{-b\log\left(F\right)}\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*F^a*erf(-sqrt(-b*log(F))*d*(x + c/d))/(sqrt(-b*log(F))*d)
```

Mupad [B]
time = 0.04, size = 48, normalized size = 1.09

$$-\frac{F^a\,\sqrt{\pi}\,\operatorname{erf}\left(\frac{1\mathrm{i}\,b\,x\,\ln\left(F\right)\,d^2+1\mathrm{i}\,b\,c\,\ln\left(F\right)\,d}{\sqrt{b\,d^2\,\ln\left(F\right)}}\right)\,1\mathrm{i}}{2\,\sqrt{b\,d^2\,\ln\left(F\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2),x)
```

```
[Out] -(F^a*pi^(1/2)*erf((b*c*d*log(F)*1i + b*d^2*x*log(F)*1i)/(b*d^2*log(F))^(1/
2))*1i)/(2*(b*d^2*log(F))^(1/2))
```

3.274 $\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^2}\,dx$

Optimal. Leaf size=67

$$-\frac{F^{a+b(c+dx)^2}}{d(c+dx)}+\frac{\sqrt{b}\,F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)\sqrt{\log(F)}}{d}$$

```
[Out] -F^(a+b*(d*x+c)^2)/d/(d*x+c)+F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*b^(1/2)*
Pi^(1/2)*ln(F)^(1/2)/d
```

Rubi [A]
time = 0.06, antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2245, 2235}

$$\frac{\sqrt{\pi}\,\sqrt{b}\,F^a\sqrt{\log(F)}\,\mathrm{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{d}-\frac{F^{a+b(c+dx)^2}}{d(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)/(c + d*x)^2,x]
```

```
[Out] -(F^(a + b*(c + d*x)^2)/(d*(c + d*x))) + (Sqrt[b]*F^a*Sqrt[Pi]*Erfi[Sqrt[b]
*(c + d*x)*Sqrt[Log[F]]]*Sqrt[Log[F]])/d
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^2}\,dx = -\frac{F^{a+b(c+dx)^2}}{d(c+dx)} + (2b\log(F))\int F^{a+b(c+dx)^2}\,dx$$
$$= -\frac{F^{a+b(c+dx)^2}}{d(c+dx)} + \frac{\sqrt{b}\,F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)\sqrt{\log(F)}}{d}$$

Mathematica [A]
time = 0.23, size = 63, normalized size = 0.94

$$\frac{F^a\left(-\frac{F^{b(c+dx)^2}}{c+dx} + \sqrt{b}\,\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)\sqrt{\log(F)}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)/(c + d*x)^2,x]
```

```
[Out] (F^a*(-(F^(b*(c + d*x)^2)/(c + d*x)) + Sqrt[b]*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d
*x)*Sqrt[Log[F]]]*Sqrt[Log[F]]))/d
```

Maple [A]
time = 0.09, size = 62, normalized size = 0.93

method	result	size
risch	$-\frac{F^{b(dx+c)^2}F^a}{d(dx+c)} + \frac{b\ln(F)\sqrt{\pi}\,F^a\,\mathrm{erf}\left(\sqrt{-b\ln(F)}\,(dx+c)\right)}{d\sqrt{-b\ln(F)}}$	62

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)/(d*x+c)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/d/(d*x+c)*F^(b*(d*x+c)^2)*F^a+1/d*b*ln(F)*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*
erf((-b*ln(F))^(1/2)*(d*x+c))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^2,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^2, x)
```

Fricas [A]
time = 0.37, size = 83, normalized size = 1.24

$$-\frac{\sqrt{\pi}\sqrt{-bd^2\log(F)}\,(dx+c)F^a\operatorname{erf}\left(\frac{\sqrt{-bd^2\log(F)}\,(dx+c)}{d}\right)+F^{bd^2x^2+2\,bcdx+bc^2+a}d}{d^3x+cd^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] -(sqrt(pi)*sqrt(-b*d^2*log(F))*(d*x + c)*F^a*erf(sqrt(-b*d^2*log(F))*(d*x +
 c)/d) + F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)*d)/(d^3*x + c*d^2)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{F^{a+b(c+dx)^2}}{(c+dx)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(d*x+c)**2,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)/(c + d*x)**2, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^2,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^2, x)
```

Mupad [B]
time = 4.06, size = 86, normalized size = 1.28

$$\frac{F^a\,b\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b\,x\,\ln(F)\,d^2+b\,c\,\ln(F)\,d}{\sqrt{b\,d^2\,\ln(F)}}\right)\,\ln(F)}{\sqrt{b\,d^2\,\ln(F)}}-\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}}{d\,(c+d\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(c + d*x)^2,x)
```

```
[Out] (F^a*b*pi^(1/2)*erfi((b*c*d*log(F) + b*d^2*x*log(F))/(b*d^2*log(F))^(1/2))*
log(F))/(b*d^2*log(F))^(1/2) - (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x))/
(d*(c + d*x))
```

3.275 $\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^4}\,dx$

Optimal. Leaf size=102

$$-\frac{F^{a+b(c+dx)^2}}{3d(c+dx)^3}-\frac{2bF^{a+b(c+dx)^2}\log(F)}{3d(c+dx)}+\frac{2b^{3/2}F^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)\log^{\frac{3}{2}}(F)}{3d}$$

```
[Out] -1/3*F^(a+b*(d*x+c)^2)/d/(d*x+c)^3-2/3*b*F^(a+b*(d*x+c)^2)*ln(F)/d/(d*x+c)+
2/3*b^(3/2)*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*ln(F)^(3/2)*Pi^(1/2)/d
```

Rubi [A]
time = 0.10, antiderivative size = 102, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2245, 2235}

$$\frac{2\sqrt{\pi}\,b^{3/2}F^a\log^{\frac{3}{2}}(F)\text{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{3d}-\frac{F^{a+b(c+dx)^2}}{3d(c+dx)^3}-\frac{2b\log(F)F^{a+b(c+dx)^2}}{3d(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)/(c + d*x)^4,x]
```

```
[Out] -1/3*F^(a + b*(c + d*x)^2)/(d*(c + d*x)^3) - (2*b*F^(a + b*(c + d*x)^2)*Log
[F])/(3*d*(c + d*x)) + (2*b^(3/2)*F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[
Log[F]]]*Log[F]^(3/2))/(3*d)
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^4}\,dx = -\frac{F^{a+b(c+dx)^2}}{3d(c+dx)^3} + \frac{1}{3}(2b\log(F))\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^2}\,dx$$
$$= -\frac{F^{a+b(c+dx)^2}}{3d(c+dx)^3} - \frac{2bF^{a+b(c+dx)^2}\log(F)}{3d(c+dx)} + \frac{1}{3}\left(4b^2\log^2(F)\right)\int F^{a+b(c+dx)^2}\,dx$$
$$= -\frac{F^{a+b(c+dx)^2}}{3d(c+dx)^3} - \frac{2bF^{a+b(c+dx)^2}\log(F)}{3d(c+dx)} + \frac{2b^{3/2}F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)\log^{\frac{3}{2}}(}{3d}$$

Mathematica [A]
time = 0.29, size = 81, normalized size = 0.79

$$\frac{F^a\left(2b^{3/2}\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)\log^{\frac{3}{2}}(F) - \frac{F^{b(c+dx)^2}(1+2b(c+dx)^2\log(F))}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)/(c + d*x)^4,x]
```

```
[Out] (F^a*(2*b^(3/2)*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]*Log[F]^(3/2)
- (F^(b*(c + d*x)^2)*(1 + 2*b*(c + d*x)^2*Log[F]))/(c + d*x)^3))/(3*d)
```

Maple [A]
time = 0.08, size = 96, normalized size = 0.94

method	result	size
risch	$-\frac{F^{b(dx+c)^2}F^a}{3d(dx+c)^3} - \frac{2b\ln(F)F^{b(dx+c)^2}F^a}{3d(dx+c)} + \frac{2b^2\ln(F)^2\sqrt{\pi}\,F^a\,\mathrm{erf}\left(\sqrt{-b\ln(F)}\,(dx+c)\right)}{3d\sqrt{-b\ln(F)}}$	96

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)/(d*x+c)^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3/d/(d*x+c)^3*F^(b*(d*x+c)^2)*F^a-2/3/d*b*ln(F)/(d*x+c)*F^(b*(d*x+c)^2)*
F^a+2/3/d*b^2*ln(F)^2*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1/2)*(d
*x+c))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^4,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^4, x)
```

Fricas [A]
time = 0.41, size = 163, normalized size = 1.60

$$-\frac{2\sqrt{\pi}\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3\right)\sqrt{-bd^2\log\left(F\right)}\,F^a\operatorname{erf}\left(\frac{\sqrt{-bd^2\log\left(F\right)}\,(dx+c)}{d}\right)\log\left(F\right)+\left(2\left(bd^3x^2+2\,bcd^2x+bc^2d\right)\log\left(F\right)+d\right)F^{bd^2x^2+2\,bcdx+bc^2+a}}{3\left(d^5x^3+3\,cd^4x^2+3\,c^2d^3x+c^3d^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] -1/3*(2*sqrt(pi)*(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*sqrt(-b*
d^2*log(F))*F^a*erf(sqrt(-b*d^2*log(F))*(d*x + c)/d)*log(F) + (2*(b*d^3*x^2
 + 2*b*c*d^2*x + b*c^2*d)*log(F) + d)*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)
)/(d^5*x^3 + 3*c*d^4*x^2 + 3*c^2*d^3*x + c^3*d^2)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(d*x+c)**4,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)/(c + d*x)**4, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^4,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^4, x)
```

Mupad [B]
time = 5.03, size = 201, normalized size = 1.97

$$\frac{2\,F^a\,b^2\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln(F)\,d^2+b\,c\,\ln(F)\,d}{\sqrt{b\,d^2\,\ln\left(F\right)}}\right)\,\ln\left(F\right)^2}{3\,\sqrt{b\,d^2\,\ln\left(F\right)}}-\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,\left(\frac{1}{3\,d}+\frac{2\,b\,c^2\,\ln(F)}{3\,d}\right)+\frac{4\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,b\,c\,x\,\ln(F)}{3}+\frac{2\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,b\,d\,x^2\,\ln(F)}{3}}{c^3+3\,c^2\,d\,x+3\,c\,d^2\,x^2+d^3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(c + d*x)^4,x)
```

```
[Out] (2*F^a*b^2*pi^(1/2)*erfi((b*c*d*log(F) + b*d^2*x*log(F))/(b*d^2*log(F))^(1/
2))*log(F)^2)/(3*(b*d^2*log(F))^(1/2)) - (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*
b*c*d*x)*(1/(3*d) + (2*b*c^2*log(F))/(3*d)) + (4*F^(b*d^2*x^2)*F^a*F^(b*c^2
)*F^(2*b*c*d*x)*b*c*x*log(F))/3 + (2*F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d
*x)*b*d*x^2*log(F))/3)/(c^3 + d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x)
```

3.276 $\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^6} dx$

Optimal. Leaf size=136

$$-\frac{F^{a+b(c+dx)^2}}{5d(c+dx)^5}-\frac{2bF^{a+b(c+dx)^2}\log(F)}{15d(c+dx)^3}-\frac{4b^2F^{a+b(c+dx)^2}\log^2(F)}{15d(c+dx)}+\frac{4b^{5/2}F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)\log^{\frac{5}{2}}$$

```
[Out] -1/5*F^(a+b*(d*x+c)^2)/d/(d*x+c)^5-2/15*b*F^(a+b*(d*x+c)^2)*ln(F)/d/(d*x+c)
^3-4/15*b^2*F^(a+b*(d*x+c)^2)*ln(F)^2/d/(d*x+c)+4/15*b^(5/2)*F^a*erfi((d*x+
c)*b^(1/2)*ln(F)^(1/2))*ln(F)^(5/2)*Pi^(1/2)/d
```

Rubi [A]
time = 0.15, antiderivative size = 136, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2245, 2235}

$$\frac{4\sqrt{\pi}\,b^{5/2}F^a\log^{\frac{5}{2}}(F)\mathrm{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{15d}-\frac{4b^2\log^2(F)F^{a+b(c+dx)^2}}{15d(c+dx)}-\frac{F^{a+b(c+dx)^2}}{5d(c+dx)^5}-\frac{2b\log(F)F^{a+b(c+dx)^2}}{15d(c+dx)^3}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)/(c + d*x)^6,x]
```

```
[Out] -1/5*F^(a + b*(c + d*x)^2)/(d*(c + d*x)^5) - (2*b*F^(a + b*(c + d*x)^2)*Log
[F])/(15*d*(c + d*x)^3) - (4*b^2*F^(a + b*(c + d*x)^2)*Log[F]^2)/(15*d*(c +
 d*x)) + (4*b^(5/2)*F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]*Log[F
]^(5/2))/(15*d)
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^6}\,dx = -\frac{F^{a+b(c+dx)^2}}{5d(c+dx)^5} + \frac{1}{5}(2b\log(F))\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^4}\,dx$$

$$= -\frac{F^{a+b(c+dx)^2}}{5d(c+dx)^5} - \frac{2bF^{a+b(c+dx)^2}\log(F)}{15d(c+dx)^3} + \frac{1}{15}\left(4b^2\log^2(F)\right)\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^2}\,dx$$

$$= -\frac{F^{a+b(c+dx)^2}}{5d(c+dx)^5} - \frac{2bF^{a+b(c+dx)^2}\log(F)}{15d(c+dx)^3} - \frac{4b^2F^{a+b(c+dx)^2}\log^2(F)}{15d(c+dx)} + \frac{1}{15}\left(8b^3\log^3(F)\right)\int F$$

$$= -\frac{F^{a+b(c+dx)^2}}{5d(c+dx)^5} - \frac{2bF^{a+b(c+dx)^2}\log(F)}{15d(c+dx)^3} - \frac{4b^2F^{a+b(c+dx)^2}\log^2(F)}{15d(c+dx)} + \frac{4b^{5/2}F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\right.}{}$$

Mathematica [A]
time = 0.32, size = 97, normalized size = 0.71

$$\frac{F^a\left(4b^{5/2}\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)\log^{\frac{5}{2}}(F) - \frac{F^{b(c+dx)^2}\left(3+2b(c+dx)^2\log(F)+4b^2(c+dx)^4\log^2(F)\right)}{(c+dx)^5}\right)}{15d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)/(c + d*x)^6,x]
```

```
[Out] (F^a*(4*b^(5/2)*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]*Log[F]^(5/2)
- (F^(b*(c + d*x)^2)*(3 + 2*b*(c + d*x)^2*Log[F] + 4*b^2*(c + d*x)^4*Log[F]
^2))/(c + d*x)^5))/(15*d)
```

Maple [A]
time = 0.08, size = 129, normalized size = 0.95

method	result	s
risch	$-\frac{F^{b(dx+c)^2}F^a}{5d(dx+c)^5} - \frac{2b\ln(F)F^{b(dx+c)^2}F^a}{15d(dx+c)^3} - \frac{4b^2\ln(F)^2F^{b(dx+c)^2}F^a}{15d(dx+c)} + \frac{4b^3\ln(F)^3\sqrt{\pi}\,F^a\,\mathrm{erf}\left(\sqrt{-b\ln(F)}\,(dx+c)\right)}{15d\sqrt{-b\ln(F)}}$	1

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)/(d*x+c)^6,x,method=_RETURNVERBOSE)
```

```
[Out] -1/5/d/(d*x+c)^5*F^(b*(d*x+c)^2)*F^a-2/15/d*b*ln(F)/(d*x+c)^3*F^(b*(d*x+c)^
2)*F^a-4/15/d*b^2*ln(F)^2/(d*x+c)*F^(b*(d*x+c)^2)*F^a+4/15/d*b^3*ln(F)^3*Pi
^(1/2)*F^a/(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1/2)*(d*x+c))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^6,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^6, x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 288 vs. 2(118) = 236.
time = 0.38, size = 288, normalized size = 2.12

$$-\frac{4\sqrt{\pi}\left(b^2d^5x^5+5\,b^2cd^4x^4+10\,b^2c^2d^3x^3+10\,b^2c^3d^2x^2+5\,b^2c^4dx+b^2c^5\right)\sqrt{-bd^2\log\left(F\right)}\,F^a\operatorname{erf}\left(\frac{\sqrt{-bd^2\log\left(F\right)}\,(dx+c)}{d}\right)\log\left(F\right)^2+\left(4\left(b^2d^5x^4+4\,b^2cd^4x^3+6\,b^2c^2d^3x^2+4\,b^2c^3d^2x+b^2c^4d\right)\log\left(F\right)^2+2\left(bd^3x^2+2\,bcd^2x+bc^2d\right)\log\left(F\right)+3\,d\right)F^{bd^2x^2+2\,bcdx+bc^2+a}}{15\left(d^7x^5+5\,cd^6x^4+10\,c^2d^5x^3+10\,c^3d^4x^2+5\,c^4d^3x+c^5d^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^6,x, algorithm="fricas")
```

```
[Out] -1/15*(4*sqrt(pi)*(b^2*d^5*x^5 + 5*b^2*c*d^4*x^4 + 10*b^2*c^2*d^3*x^3 + 10*
b^2*c^3*d^2*x^2 + 5*b^2*c^4*d*x + b^2*c^5)*sqrt(-b*d^2*log(F))*F^a*erf(sqrt
(-b*d^2*log(F))*(d*x + c)/d)*log(F)^2 + (4*(b^2*d^5*x^4 + 4*b^2*c*d^4*x^3 +
 6*b^2*c^2*d^3*x^2 + 4*b^2*c^3*d^2*x + b^2*c^4*d)*log(F)^2 + 2*(b*d^3*x^2 +
 2*b*c*d^2*x + b*c^2*d)*log(F) + 3*d)*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)
)/(d^7*x^5 + 5*c*d^6*x^4 + 10*c^2*d^5*x^3 + 10*c^3*d^4*x^2 + 5*c^4*d^3*x +
c^5*d^2)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(d*x+c)**6,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^6,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^6, x)
```

Mupad [B]
time = 4.87, size = 168, normalized size = 1.24

$$\frac{4\,F^a\,\sqrt{\pi}\,\operatorname{erfc}\left(\sqrt{-b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^2}\right)\,{\left(-b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^2\right)}^{5/2}}{15\,d\,{\left(c+d\,x\right)}^5}-\frac{4\,F^a\,\sqrt{\pi}\,{\left(-b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^2\right)}^{5/2}}{15\,d\,{\left(c+d\,x\right)}^5}-\frac{4\,F^a\,F^{b\,{\left(c+d\,x\right)}^2}\,b^2\,{\ln\left(F\right)}^2}{15\,d\,\left(c+d\,x\right)}-\frac{2\,F^a\,F^{b\,{\left(c+d\,x\right)}^2}\,b\,\ln\left(F\right)}{15\,d\,{\left(c+d\,x\right)}^3}-\frac{F^a\,F^{b\,{\left(c+d\,x\right)}^2}}{5\,d\,{\left(c+d\,x\right)}^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(c + d*x)^6,x)
```

```
[Out] (4*F^a*pi^(1/2)*erfc((-b*log(F)*(c + d*x)^2)^(1/2))*(-b*log(F)*(c + d*x)^2)
^(5/2))/(15*d*(c + d*x)^5) - (4*F^a*pi^(1/2)*(-b*log(F)*(c + d*x)^2)^(5/2))
/(15*d*(c + d*x)^5) - (4*F^a*F^(b*(c + d*x)^2)*b^2*log(F)^2)/(15*d*(c + d*x
)) - (2*F^a*F^(b*(c + d*x)^2)*b*log(F))/(15*d*(c + d*x)^3) - (F^a*F^(b*(c +
 d*x)^2))/(5*d*(c + d*x)^5)
```

3.277 $\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^8} dx$

Optimal. Leaf size=170

$$-\frac{F^{a+b(c+dx)^2}}{7d(c+dx)^7}-\frac{2bF^{a+b(c+dx)^2}\log(F)}{35d(c+dx)^5}-\frac{4b^2F^{a+b(c+dx)^2}\log^2(F)}{105d(c+dx)^3}-\frac{8b^3F^{a+b(c+dx)^2}\log^3(F)}{105d(c+dx)}+\frac{8b^{7/2}F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\right.}{}$$

```
[Out] -1/7*F^(a+b*(d*x+c)^2)/d/(d*x+c)^7-2/35*b*F^(a+b*(d*x+c)^2)*ln(F)/d/(d*x+c)
^5-4/105*b^2*F^(a+b*(d*x+c)^2)*ln(F)^2/d/(d*x+c)^3-8/105*b^3*F^(a+b*(d*x+c)
^2)*ln(F)^3/d/(d*x+c)+8/105*b^(7/2)*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*l
n(F)^(7/2)*Pi^(1/2)/d
```

Rubi [A]
time = 0.20, antiderivative size = 170, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2245, 2235}

$$\frac{8\sqrt{\pi}\,b^{7/2}F^a\log^{\frac{7}{2}}(F)\mathrm{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{105d}-\frac{8b^3\log^3(F)F^{a+b(c+dx)^2}}{105d(c+dx)}-\frac{4b^2\log^2(F)F^{a+b(c+dx)^2}}{105d(c+dx)^3}-\frac{F^{a+b(c+dx)^2}}{7d(c+dx)^7}-\frac{2b\log(F)F^{a+b(c+dx)^2}}{35d(c+dx)^5}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)/(c + d*x)^8,x]
```

```
[Out] -1/7*F^(a + b*(c + d*x)^2)/(d*(c + d*x)^7) - (2*b*F^(a + b*(c + d*x)^2)*Log
[F])/(35*d*(c + d*x)^5) - (4*b^2*F^(a + b*(c + d*x)^2)*Log[F]^2)/(105*d*(c
+ d*x)^3) - (8*b^3*F^(a + b*(c + d*x)^2)*Log[F]^3)/(105*d*(c + d*x)) + (8*b
^(7/2)*F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]*Log[F]^(7/2))/(105
*d)
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^8}\,dx = -\frac{F^{a+b(c+dx)^2}}{7d(c+dx)^7} + \frac{1}{7}(2b\log(F)) \int \frac{F^{a+b(c+dx)^2}}{(c+dx)^6}\,dx$$
$$= -\frac{F^{a+b(c+dx)^2}}{7d(c+dx)^7} - \frac{2bF^{a+b(c+dx)^2}\log(F)}{35d(c+dx)^5} + \frac{1}{35}\left(4b^2\log^2(F)\right) \int \frac{F^{a+b(c+dx)^2}}{(c+dx)^4}\,dx$$
$$= -\frac{F^{a+b(c+dx)^2}}{7d(c+dx)^7} - \frac{2bF^{a+b(c+dx)^2}\log(F)}{35d(c+dx)^5} - \frac{4b^2F^{a+b(c+dx)^2}\log^2(F)}{105d(c+dx)^3} + \frac{1}{105}\left(8b^3\log^3(F)\right) \int$$
$$= -\frac{F^{a+b(c+dx)^2}}{7d(c+dx)^7} - \frac{2bF^{a+b(c+dx)^2}\log(F)}{35d(c+dx)^5} - \frac{4b^2F^{a+b(c+dx)^2}\log^2(F)}{105d(c+dx)^3} - \frac{8b^3F^{a+b(c+dx)^2}\log^3(F}{105d(c+dx)}$$
$$= -\frac{F^{a+b(c+dx)^2}}{7d(c+dx)^7} - \frac{2bF^{a+b(c+dx)^2}\log(F)}{35d(c+dx)^5} - \frac{4b^2F^{a+b(c+dx)^2}\log^2(F)}{105d(c+dx)^3} - \frac{8b^3F^{a+b(c+dx)^2}\log^3(F}{105d(c+dx)}$$

Mathematica [A]
time = 0.36, size = 112, normalized size = 0.66

$$\frac{F^a\left(8b^{7/2}\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)\log^{\frac{7}{2}}(F) + \frac{F^{b(c+dx)^2}\left(-15-6b(c+dx)^2\log(F)-4b^2(c+dx)^4\log^2(F)-8b^3(c+dx)^6\log^3(F)\right)}{(c+dx)^7}\right)}{105d}$$

Antiderivative was successfully verified.

[In] Integrate[F^(a + b*(c + d*x)^2)/(c + d*x)^8,x]

[Out] (F^a*(8*b^(7/2)*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]*Log[F]^(7/2)
+ (F^(b*(c + d*x)^2)*(-15 - 6*b*(c + d*x)^2*Log[F] - 4*b^2*(c + d*x)^4*Log[
F]^2 - 8*b^3*(c + d*x)^6*Log[F]^3))/(c + d*x)^7))/(105*d)

Maple [A]
time = 0.10, size = 162, normalized size = 0.95

method	result
risch	$-\frac{F^{b(dx+c)^2}F^a}{7d(dx+c)^7} - \frac{2b\ln(F)F^{b(dx+c)^2}F^a}{35d(dx+c)^5} - \frac{4b^2\ln(F)^2F^{b(dx+c)^2}F^a}{105d(dx+c)^3} - \frac{8b^3\ln(F)^3F^{b(dx+c)^2}F^a}{105d(dx+c)} + \frac{8b^4\ln(F)^4\sqrt{\pi}\,F^a\,\mathrm{erf}\left(\sqrt{\right.}}{105d\sqrt{-b}}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a+b*(d*x+c)^2)/(d*x+c)^8,x,method=_RETURNVERBOSE)

[Out] -1/7/d/(d*x+c)^7*F^(b*(d*x+c)^2)*F^a-2/35/d*b*ln(F)/(d*x+c)^5*F^(b*(d*x+c)^
2)*F^a-4/105/d*b^2*ln(F)^2/(d*x+c)^3*F^(b*(d*x+c)^2)*F^a-8/105/d*b^3*ln(F)^
3/(d*x+c)*F^(b*(d*x+c)^2)*F^a+8/105/d*b^4*ln(F)^4*Pi^(1/2)*F^a/(-b*ln(F))^(
1/2)*erf((-b*ln(F))^(1/2)*(d*x+c))

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^8,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^8, x)
```

Fricas [**B**] Leaf count of result is larger than twice the leaf count of optimal. 429 vs. $2(150) = 300$.
time = 0.37, size = 429, normalized size = 2.52

$$-\frac{8\sqrt{\pi}\left(b^3d^7x^7+7\,b^3cd^6x^6+21\,b^3c^2d^5x^5+35\,b^3c^3d^4x^4+35\,b^3c^4d^3x^3+21\,b^3c^5d^2x^2+7\,b^3c^6dx+b^3c^7\right)\sqrt{-bd^2\log\left(F\right)}\,F^a\operatorname{erf}\left(\frac{\sqrt{-bd^2\log\left(F\right)}\,(dx+c)}{d}\right)\log\left(F\right)^3+\left(8\left(b^3d^7x^6+6\,b^3cd^6x^5+15\,b^3c^2d^5x^4+20\,b^3c^3d^4x^3+15\,b^3c^4d^3x^2+6\,b^3c^5d^2x+b^3c^6d\right)\log\left(F\right)^3+4\left(b^2d^5x^4+4\,b^2cd^4x^3+6\,b^2c^2d^3x^2+4\,b^2c^3d^2x+b^2c^4d\right)\log\left(F\right)^2+6\left(bd^3x^2+2\,bcd^2x+bc^2d\right)\log\left(F\right)+15\,d\right)F^{bd^2x^2+2\,bcdx+bc^2+a}}{105\left(d^9x^7+7\,cd^8x^6+21\,c^2d^7x^5+35\,c^3d^6x^4+35\,c^4d^5x^3+21\,c^5d^4x^2+7\,c^6d^3x+c^7d^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^8,x, algorithm="fricas")
```

```
[Out] -1/105*(8*sqrt(pi)*(b^3*d^7*x^7 + 7*b^3*c*d^6*x^6 + 21*b^3*c^2*d^5*x^5 + 35
*b^3*c^3*d^4*x^4 + 35*b^3*c^4*d^3*x^3 + 21*b^3*c^5*d^2*x^2 + 7*b^3*c^6*d*x
+ b^3*c^7)*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^2*log(F))*(d*x + c)/d)*log
(F)^3 + (8*(b^3*d^7*x^6 + 6*b^3*c*d^6*x^5 + 15*b^3*c^2*d^5*x^4 + 20*b^3*c^3
*d^4*x^3 + 15*b^3*c^4*d^3*x^2 + 6*b^3*c^5*d^2*x + b^3*c^6*d)*log(F)^3 + 4*(
b^2*d^5*x^4 + 4*b^2*c*d^4*x^3 + 6*b^2*c^2*d^3*x^2 + 4*b^2*c^3*d^2*x + b^2*c
^4*d)*log(F)^2 + 6*(b*d^3*x^2 + 2*b*c*d^2*x + b*c^2*d)*log(F) + 15*d)*F^(b*
d^2*x^2 + 2*b*c*d*x + b*c^2 + a))/(d^9*x^7 + 7*c*d^8*x^6 + 21*c^2*d^7*x^5 +
 35*c^3*d^6*x^4 + 35*c^4*d^5*x^3 + 21*c^5*d^4*x^2 + 7*c^6*d^3*x + c^7*d^2)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(d*x+c)**8,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^8,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^8, x)
```

Mupad [B]
time = 4.13, size = 201, normalized size = 1.18

$$\frac{8\,F^a\,\sqrt{\pi}\,{\left(-b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^2\right)}^{7/2}}{105\,d\,{\left(c+d\,x\right)}^7}-\frac{F^a\,F^{b\,{\left(c+d\,x\right)}^2}}{7\,d\,{\left(c+d\,x\right)}^7}-\frac{4\,F^a\,F^{b\,{\left(c+d\,x\right)}^2}\,b^2\,{\ln\left(F\right)}^2}{105\,d\,{\left(c+d\,x\right)}^3}-\frac{8\,F^a\,F^{b\,{\left(c+d\,x\right)}^2}\,b^3\,{\ln\left(F\right)}^3}{105\,d\,\left(c+d\,x\right)}-\frac{2\,F^a\,F^{b\,{\left(c+d\,x\right)}^2}\,b\,\ln\left(F\right)}{35\,d\,{\left(c+d\,x\right)}^5}-\frac{8\,F^a\,\sqrt{\pi}\,\mathrm{erfc}\left(\sqrt{-b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^2}\right)\,{\left(-b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^2\right)}^{7/2}}{105\,d\,{\left(c+d\,x\right)}^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(c + d*x)^8,x)
```

```
[Out] (8*F^a*pi^(1/2)*(-b*log(F)*(c + d*x)^2)^(7/2))/(105*d*(c + d*x)^7) - (F^a*F
^(b*(c + d*x)^2))/(7*d*(c + d*x)^7) - (4*F^a*F^(b*(c + d*x)^2)*b^2*log(F)^2
)/(105*d*(c + d*x)^3) - (8*F^a*F^(b*(c + d*x)^2)*b^3*log(F)^3)/(105*d*(c +
d*x)) - (2*F^a*F^(b*(c + d*x)^2)*b*log(F))/(35*d*(c + d*x)^5) - (8*F^a*pi^(
1/2)*erfc((-b*log(F)*(c + d*x)^2)^(1/2))*(-b*log(F)*(c + d*x)^2)^(7/2))/(10
5*d*(c + d*x)^7)
```

3.278 $\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^{10}}\,dx$

Optimal. Leaf size=49

$$-\frac{F^a\Gamma\left(-\frac{9}{2},-b(c+dx)^2\log(F)\right)\left(-b(c+dx)^2\log(F)\right)^{9/2}}{2d(c+dx)^9}$$

```
[Out] -1/2*F^a*(-32/945*Pi^(1/2)*erfc((-b*(d*x+c)^2*ln(F))^(1/2))+32/945/(-b*(d*x
+c)^2*ln(F))^(1/2)*exp(b*(d*x+c)^2*ln(F))-16/945/(-b*(d*x+c)^2*ln(F))^(3/2)
*exp(b*(d*x+c)^2*ln(F))+8/315/(-b*(d*x+c)^2*ln(F))^(5/2)*exp(b*(d*x+c)^2*ln
(F))-4/63/(-b*(d*x+c)^2*ln(F))^(7/2)*exp(b*(d*x+c)^2*ln(F))+2/9/(-b*(d*x+c)
^2*ln(F))^(9/2)*exp(b*(d*x+c)^2*ln(F)))*(-b*(d*x+c)^2*ln(F))^(9/2)/d/(d*x+c
)^9
```

Rubi [A]
time = 0.05, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$-\frac{F^a\left(-b\log(F)(c+dx)^2\right)^{9/2}\text{Gamma}\left(-\frac{9}{2},-b\log(F)(c+dx)^2\right)}{2d(c+dx)^9}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)/(c + d*x)^10,x]
```

```
[Out] -1/2*(F^a*Gamma[-9/2, -(b*(c + d*x)^2*Log[F])]*(-(b*(c + d*x)^2*Log[F]))^(9
/2))/(d*(c + d*x)^9)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^{10}}\,dx = -\frac{F^a\Gamma\left(-\frac{9}{2},-b(c+dx)^2\log(F)\right)\left(-b(c+dx)^2\log(F)\right)^{9/2}}{2d(c+dx)^9}$$

Mathematica [A]
time = 0.30, size = 49, normalized size = 1.00

$$-\frac{F^a\Gamma\left(-\frac{9}{2},-b(c+dx)^2\log(F)\right)\left(-b(c+dx)^2\log(F)\right)^{9/2}}{2d(c+dx)^9}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)/(c + d*x)^10,x]
```

```
[Out] -1/2*(F^a*Gamma[-9/2, -(b*(c + d*x)^2*Log[F])]*(-(b*(c + d*x)^2*Log[F]))^(9
/2))/(d*(c + d*x)^9)
```

Maple [A]
time = 0.11, size = 195, normalized size = 3.98

method	result
risch	$-\frac{F^{b(dx+c)^2} F^a}{9d(dx+c)^9} - \frac{2b\ln(F) F^{b(dx+c)^2} F^a}{63d(dx+c)^7} - \frac{4b^2\ln(F)^2 F^{b(dx+c)^2} F^a}{315d(dx+c)^5} - \frac{8b^3\ln(F)^3 F^{b(dx+c)^2} F^a}{945d(dx+c)^3} - \frac{16b^4\ln(F)^4 F^{b(dx+c)^2} F^a}{945d(dx+c)} +$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)/(d*x+c)^10,x,method=_RETURNVERBOSE)
```

```
[Out] -1/9/d/(d*x+c)^9*F^(b*(d*x+c)^2)*F^a-2/63/d*b*ln(F)/(d*x+c)^7*F^(b*(d*x+c)^
2)*F^a-4/315/d*b^2*ln(F)^2/(d*x+c)^5*F^(b*(d*x+c)^2)*F^a-8/945/d*b^3*ln(F)^
3/(d*x+c)^3*F^(b*(d*x+c)^2)*F^a-16/945/d*b^4*ln(F)^4/(d*x+c)*F^(b*(d*x+c)^2
)*F^a+16/945/d*b^5*ln(F)^5*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1/
2)*(d*x+c))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^10,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^10, x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 598 vs. $2(185) = 370$.
time = 0.37, size = 598, normalized size = 12.20

$$-\frac{16\sqrt{\pi}\left(b^4d^9x^9 + 9b^4cd^8x^8 + 36b^4c^2d^7x^7 + 84b^4c^3d^6x^6 + 126b^4c^4d^5x^5 + 126b^4c^5d^4x^4 + 84b^4c^6d^3x^3 + 36b^4c^7d^2x^2 + 9b^4c^8dx + b^4c^9\right)\sqrt{-bd^2\log(F)}F^a \operatorname{erf}\left(\frac{\sqrt{-bd^2\log(F)}(dx+c)}{d}\right)\log(F)^4 + \left(16\left(b^4d^9x^8 + 8b^4cd^8x^7 + 28b^4c^2d^7x^6 + 56b^4c^3d^6x^5 + 70b^4c^4d^5x^4 + 56b^4c^5d^4x^3 + 28b^4c^6d^3x^2 + 8b^4c^7d^2x + b^4c^8d\right)\log(F)^4 + 8\left(b^3d^7x^6 + 6b^3cd^6x^5 + 15b^3c^2d^5x^4 + 20b^3c^3d^4x^3 + 15b^3c^4d^3x^2 + 6b^3c^5d^2x + b^3c^6d\right)\log(F)^3 + 12\left(b^2d^5x^4 + 4b^2cd^4x^3 + 6b^2c^2d^3x^2 + 4b^2c^3d^2x + b^2c^4d\right)\log(F)^2 + 30\left(bd^3x^2 + 2bcd^2x + bc^2d\right)\log(F) + 105d\right)F^{bd^2x^2+2bcdx+bc^2+a}}{945\left(d^{11}x^9 + 9cd^{10}x^8 + 36c^2d^9x^7 + 84c^3d^8x^6 + 126c^4d^7x^5 + 126c^5d^6x^4 + 84c^6d^5x^3 + 36c^7d^4x^2 + 9c^8d^3x + c^9d^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^10,x, algorithm="fricas")
```

```
[Out] -1/945*(16*sqrt(pi)*(b^4*d^9*x^9 + 9*b^4*c*d^8*x^8 + 36*b^4*c^2*d^7*x^7 + 8
4*b^4*c^3*d^6*x^6 + 126*b^4*c^4*d^5*x^5 + 126*b^4*c^5*d^4*x^4 + 84*b^4*c^6*
d^3*x^3 + 36*b^4*c^7*d^2*x^2 + 9*b^4*c^8*d*x + b^4*c^9)*sqrt(-b*d^2*log(F))
*F^a*erf(sqrt(-b*d^2*log(F))*(d*x + c)/d)*log(F)^4 + (16*(b^4*d^9*x^8 + 8*b
```

```
^4*c*d^8*x^7 + 28*b^4*c^2*d^7*x^6 + 56*b^4*c^3*d^6*x^5 + 70*b^4*c^4*d^5*x^4
 + 56*b^4*c^5*d^4*x^3 + 28*b^4*c^6*d^3*x^2 + 8*b^4*c^7*d^2*x + b^4*c^8*d)*l
og(F)^4 + 8*(b^3*d^7*x^6 + 6*b^3*c*d^6*x^5 + 15*b^3*c^2*d^5*x^4 + 20*b^3*c^
3*d^4*x^3 + 15*b^3*c^4*d^3*x^2 + 6*b^3*c^5*d^2*x + b^3*c^6*d)*log(F)^3 + 12
*(b^2*d^5*x^4 + 4*b^2*c*d^4*x^3 + 6*b^2*c^2*d^3*x^2 + 4*b^2*c^3*d^2*x + b^2
*c^4*d)*log(F)^2 + 30*(b*d^3*x^2 + 2*b*c*d^2*x + b*c^2*d)*log(F) + 105*d)*F
^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a))/(d^11*x^9 + 9*c*d^10*x^8 + 36*c^2*d^9
*x^7 + 84*c^3*d^8*x^6 + 126*c^4*d^7*x^5 + 126*c^5*d^6*x^4 + 84*c^6*d^5*x^3
+ 36*c^7*d^4*x^2 + 9*c^8*d^3*x + c^9*d^2)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(d*x+c)**10,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^10,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^10, x)
```

Mupad [**B**]
time = 4.09, size = 234, normalized size = 4.78

$$\frac{16\,F^a\,\sqrt{\pi}\,\mathrm{erfc}\left(\sqrt{-b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^2}\right)\,{\left(-b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^2\right)}^{9/2}}{945\,d\,{\left(c+d\,x\right)}^9}-\frac{16\,F^a\,\sqrt{\pi}\,{\left(-b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^2\right)}^{9/2}}{945\,d\,{\left(c+d\,x\right)}^9}-\frac{4\,F^a\,F^{b\,{\left(c+d\,x\right)}^2}\,b^2\,{\ln\left(F\right)}^2}{315\,d\,{\left(c+d\,x\right)}^5}-\frac{8\,F^a\,F^{b\,{\left(c+d\,x\right)}^2}\,b^3\,{\ln\left(F\right)}^3}{945\,d\,{\left(c+d\,x\right)}^3}-\frac{16\,F^a\,F^{b\,{\left(c+d\,x\right)}^2}\,b^4\,{\ln\left(F\right)}^4}{945\,d\,\left(c+d\,x\right)}-\frac{2\,F^a\,F^{b\,{\left(c+d\,x\right)}^2}\,b\,\ln\left(F\right)}{63\,d\,{\left(c+d\,x\right)}^7}-\frac{F^a\,F^{b\,{\left(c+d\,x\right)}^2}}{9\,d\,{\left(c+d\,x\right)}^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(c + d*x)^10,x)
```

```
[Out] (16*F^a*pi^(1/2)*erfc((-b*log(F)*(c + d*x)^2)^(1/2))*(-b*log(F)*(c + d*x)^2
)^(9/2))/(945*d*(c + d*x)^9) - (16*F^a*pi^(1/2)*(-b*log(F)*(c + d*x)^2)^(9/
2))/(945*d*(c + d*x)^9) - (4*F^a*F^(b*(c + d*x)^2)*b^2*log(F)^2)/(315*d*(c
+ d*x)^5) - (8*F^a*F^(b*(c + d*x)^2)*b^3*log(F)^3)/(945*d*(c + d*x)^3) - (1
6*F^a*F^(b*(c + d*x)^2)*b^4*log(F)^4)/(945*d*(c + d*x)) - (2*F^a*F^(b*(c +
d*x)^2)*b*log(F))/(63*d*(c + d*x)^7) - (F^a*F^(b*(c + d*x)^2))/(9*d*(c + d*
x)^9)
```

3.279 $\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^{12}} dx$

Optimal. Leaf size=49

$$-\frac{F^a\Gamma\left(-\frac{11}{2},-b(c+dx)^2\log(F)\right)\left(-b(c+dx)^2\log(F)\right)^{11/2}}{2d(c+dx)^{11}}$$

```
[Out] -1/2*F^a*(64/10395*Pi^(1/2)*erfc((-b*(d*x+c)^2*ln(F))^(1/2))-64/10395/(-b*(
d*x+c)^2*ln(F))^(1/2)*exp(b*(d*x+c)^2*ln(F))+32/10395/(-b*(d*x+c)^2*ln(F))^
(3/2)*exp(b*(d*x+c)^2*ln(F))-16/3465/(-b*(d*x+c)^2*ln(F))^(5/2)*exp(b*(d*x+
c)^2*ln(F))+8/693/(-b*(d*x+c)^2*ln(F))^(7/2)*exp(b*(d*x+c)^2*ln(F))-4/99/(-
b*(d*x+c)^2*ln(F))^(9/2)*exp(b*(d*x+c)^2*ln(F))+2/11/(-b*(d*x+c)^2*ln(F))^(
11/2)*exp(b*(d*x+c)^2*ln(F)))*(-b*(d*x+c)^2*ln(F))^(11/2)/d/(d*x+c)^11
```

Rubi [A]
time = 0.04, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$-\frac{F^a\left(-b\log(F)(c+dx)^2\right)^{11/2}\text{Gamma}\left(-\frac{11}{2},-b\log(F)(c+dx)^2\right)}{2d(c+dx)^{11}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)/(c + d*x)^12,x]
```

```
[Out] -1/2*(F^a*Gamma[-11/2, -(b*(c + d*x)^2*Log[F])]*(-(b*(c + d*x)^2*Log[F]))^(
11/2))/(d*(c + d*x)^11)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^{12}}\,dx = -\frac{F^a\Gamma\left(-\frac{11}{2},-b(c+dx)^2\log(F)\right)\left(-b(c+dx)^2\log(F)\right)^{11/2}}{2d(c+dx)^{11}}$$

Mathematica [A]
time = 0.34, size = 49, normalized size = 1.00

$$-\frac{F^a\Gamma\left(-\frac{11}{2},-b(c+dx)^2\log(F)\right)\left(-b(c+dx)^2\log(F)\right)^{11/2}}{2d(c+dx)^{11}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)/(c + d*x)^12,x]
```

```
[Out] -1/2*(F^a*Gamma[-11/2, -(b*(c + d*x)^2*Log[F])]*(-(b*(c + d*x)^2*Log[F]))^(
11/2))/(d*(c + d*x)^11)
```

Maple [A]
time = 0.14, size = 228, normalized size = 4.65

method	result
risch	$-\frac{F^{b(dx+c)^2} F^a}{11d(dx+c)^{11}} - \frac{2b\ln(F) F^{b(dx+c)^2} F^a}{99d(dx+c)^9} - \frac{4b^2\ln(F)^2 F^{b(dx+c)^2} F^a}{693d(dx+c)^7} - \frac{8b^3\ln(F)^3 F^{b(dx+c)^2} F^a}{3465d(dx+c)^5} - \frac{16b^4\ln(F)^4 F^{b(dx+c)^2} F^a}{10395d(dx+c)^3} -$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)/(d*x+c)^12,x,method=_RETURNVERBOSE)
```

```
[Out] -1/11/d/(d*x+c)^11*F^(b*(d*x+c)^2)*F^a-2/99/d*b*ln(F)/(d*x+c)^9*F^(b*(d*x+c
)^2)*F^a-4/693/d*b^2*ln(F)^2/(d*x+c)^7*F^(b*(d*x+c)^2)*F^a-8/3465/d*b^3*ln(
F)^3/(d*x+c)^5*F^(b*(d*x+c)^2)*F^a-16/10395/d*b^4*ln(F)^4/(d*x+c)^3*F^(b*(d
*x+c)^2)*F^a-32/10395/d*b^5*ln(F)^5/(d*x+c)*F^(b*(d*x+c)^2)*F^a+32/10395/d*
b^6*ln(F)^6*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1/2)*(d*x+c))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^12,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^12, x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 795 vs. 2(212) = 424.
time = 0.39, size = 795, normalized size = 16.22

$$[illegible]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^12,x, algorithm="fricas")
```

```
[Out] -1/10395*(32*sqrt(pi)*(b^5*d^11*x^11 + 11*b^5*c*d^10*x^10 + 55*b^5*c^2*d^9*
x^9 + 165*b^5*c^3*d^8*x^8 + 330*b^5*c^4*d^7*x^7 + 462*b^5*c^5*d^6*x^6 + 462
*b^5*c^6*d^5*x^5 + 330*b^5*c^7*d^4*x^4 + 165*b^5*c^8*d^3*x^3 + 55*b^5*c^9*d
^2*x^2 + 11*b^5*c^10*d*x + b^5*c^11)*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^
```

```
2*log(F))*(d*x + c)/d)*log(F)^5 + (32*(b^5*d^11*x^10 + 10*b^5*c*d^10*x^9 +
45*b^5*c^2*d^9*x^8 + 120*b^5*c^3*d^8*x^7 + 210*b^5*c^4*d^7*x^6 + 252*b^5*c^
5*d^6*x^5 + 210*b^5*c^6*d^5*x^4 + 120*b^5*c^7*d^4*x^3 + 45*b^5*c^8*d^3*x^2
+ 10*b^5*c^9*d^2*x + b^5*c^10*d)*log(F)^5 + 16*(b^4*d^9*x^8 + 8*b^4*c*d^8*x
^7 + 28*b^4*c^2*d^7*x^6 + 56*b^4*c^3*d^6*x^5 + 70*b^4*c^4*d^5*x^4 + 56*b^4*
c^5*d^4*x^3 + 28*b^4*c^6*d^3*x^2 + 8*b^4*c^7*d^2*x + b^4*c^8*d)*log(F)^4 +
24*(b^3*d^7*x^6 + 6*b^3*c*d^6*x^5 + 15*b^3*c^2*d^5*x^4 + 20*b^3*c^3*d^4*x^3
 + 15*b^3*c^4*d^3*x^2 + 6*b^3*c^5*d^2*x + b^3*c^6*d)*log(F)^3 + 60*(b^2*d^5
*x^4 + 4*b^2*c*d^4*x^3 + 6*b^2*c^2*d^3*x^2 + 4*b^2*c^3*d^2*x + b^2*c^4*d)*l
og(F)^2 + 210*(b*d^3*x^2 + 2*b*c*d^2*x + b*c^2*d)*log(F) + 945*d)*F^(b*d^2*
x^2 + 2*b*c*d*x + b*c^2 + a))/(d^13*x^11 + 11*c*d^12*x^10 + 55*c^2*d^11*x^9
 + 165*c^3*d^10*x^8 + 330*c^4*d^9*x^7 + 462*c^5*d^8*x^6 + 462*c^6*d^7*x^5 +
 330*c^7*d^6*x^4 + 165*c^8*d^5*x^3 + 55*c^9*d^4*x^2 + 11*c^10*d^3*x + c^11*
d^2)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(d*x+c)**12,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^12,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^12, x)
```

Mupad [**B**]
time = 4.15, size = 267, normalized size = 5.45

$$\frac{32\,F^a\,\sqrt{\pi}\,\left(-b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^2\right)^{11/2}}{10395\,d\,{\left(c+d\,x\right)}^{11}}-\frac{F^a\,F^{b\,{\left(c+d\,x\right)}^2}}{11\,d\,{\left(c+d\,x\right)}^{11}}-\frac{4\,F^a\,F^{b\,{\left(c+d\,x\right)}^2}\,b^2\,{\ln\left(F\right)}^2}{693\,d\,{\left(c+d\,x\right)}^7}-\frac{8\,F^a\,F^{b\,{\left(c+d\,x\right)}^2}\,b^3\,{\ln\left(F\right)}^3}{3465\,d\,{\left(c+d\,x\right)}^5}-\frac{16\,F^a\,F^{b\,{\left(c+d\,x\right)}^2}\,b^4\,{\ln\left(F\right)}^4}{10395\,d\,{\left(c+d\,x\right)}^3}-\frac{32\,F^a\,F^{b\,{\left(c+d\,x\right)}^2}\,b^5\,{\ln\left(F\right)}^5}{10395\,d\,\left(c+d\,x\right)}-\frac{2\,F^a\,F^{b\,{\left(c+d\,x\right)}^2}\,b\,\ln\left(F\right)}{99\,d\,{\left(c+d\,x\right)}^9}-\frac{32\,F^a\,\sqrt{\pi}\,\mathrm{erfc}\left(\sqrt{-b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^2}\right)\,\left(-b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^2\right)^{11/2}}{10395\,d\,{\left(c+d\,x\right)}^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(c + d*x)^12,x)
```

```
[Out] (32*F^a*pi^(1/2)*(-b*log(F)*(c + d*x)^2)^(11/2))/(10395*d*(c + d*x)^11) - (
F^a*F^(b*(c + d*x)^2))/(11*d*(c + d*x)^11) - (4*F^a*F^(b*(c + d*x)^2)*b^2*l
og(F)^2)/(693*d*(c + d*x)^7) - (8*F^a*F^(b*(c + d*x)^2)*b^3*log(F)^3)/(3465
```

```
*d*(c + d*x)^5) - (16*F^a*F^(b*(c + d*x)^2)*b^4*log(F)^4)/(10395*d*(c + d*x
)^3) - (32*F^a*F^(b*(c + d*x)^2)*b^5*log(F)^5)/(10395*d*(c + d*x)) - (2*F^a
*F^(b*(c + d*x)^2)*b*log(F))/(99*d*(c + d*x)^9) - (32*F^a*pi^(1/2)*erfc((-b
*log(F)*(c + d*x)^2)^(1/2))*(-b*log(F)*(c + d*x)^2)^(11/2))/(10395*d*(c + d
*x)^11)
```

3.280 $\int F^{a+b(c+dx)^3}(c+dx)^m\,dx$

Optimal. Leaf size=61

$$-\frac{F^a(c+dx)^{1+m}\Gamma\left(\frac{1+m}{3},-b(c+dx)^3\log(F)\right)\left(-b(c+dx)^3\log(F)\right)^{\frac{1}{3}(-1-m)}}{3d}$$

```
[Out] -1/3*F^a*(d*x+c)^(1+m)*GAMMA(1/3+1/3*m,-b*(d*x+c)^3*ln(F))*(-b*(d*x+c)^3*ln
(F))^(-1/3-1/3*m)/d
```

Rubi [A]
time = 0.04, antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2250}

$$-\frac{F^a(c+dx)^{m+1}\left(-b\log(F)(c+dx)^3\right)^{\frac{1}{3}(-m-1)}\operatorname{Gamma}\left(\frac{m+1}{3},-b\log(F)(c+dx)^3\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)*(c + d*x)^m,x]
```

```
[Out] -1/3*(F^a*(c + d*x)^(1 + m)*Gamma[(1 + m)/3, -(b*(c + d*x)^3*Log[F])]*(-(b*
(c + d*x)^3*Log[F]))^((-1 - m)/3))/d
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^3}(c+dx)^m\,dx=-\frac{F^a(c+dx)^{1+m}\Gamma\left(\frac{1+m}{3},-b(c+dx)^3\log(F)\right)\left(-b(c+dx)^3\log(F)\right)^{\frac{1}{3}(-1-m)}}{3d}$$

Mathematica [A]
time = 0.14, size = 61, normalized size = 1.00

$$-\frac{F^a(c+dx)^{1+m}\Gamma\left(\frac{1+m}{3},-b(c+dx)^3\log(F)\right)\left(-b(c+dx)^3\log(F)\right)^{\frac{1}{3}(-1-m)}}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)*(c + d*x)^m,x]
```

```
[Out] -1/3*(F^a*(c + d*x)^(1 + m)*Gamma[(1 + m)/3, -(b*(c + d*x)^3*Log[F])]*(-(b*
(c + d*x)^3*Log[F]))^((-1 - m)/3))/d
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int F^{a+b(dx+c)^3}(dx+c)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^3)*(d*x+c)^m,x)
```

```
[Out] int(F^(a+b*(d*x+c)^3)*(d*x+c)^m,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^m,x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^m*F^((d*x + c)^3*b + a), x)
```

Fricas [A]
time = 0.10, size = 71, normalized size = 1.16

$$\frac{e^{\left(-\frac{1}{3}\,(m-2)\log(-b\log(F))+a\log(F)\right)}\Gamma\left(\frac{1}{3}\,m+\frac{1}{3},-(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3)\log\left(F\right)\right)}{3\,bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^m,x, algorithm="fricas")
```

```
[Out] 1/3*e^(-1/3*(m - 2)*log(-b*log(F)) + a*log(F))*gamma(1/3*m + 1/3, -(b*d^3*x
^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F))/(b*d*log(F))
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^3}(c+dx)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)*(d*x+c)**m,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**3)*(c + d*x)**m, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^m,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^m*F^((d*x + c)^3*b + a), x)
```

Mupad [B]
time = 3.68, size = 75, normalized size = 1.23

$$\frac{F^a\,\mathrm{e}^{\frac{b\,\ln(F)\,(c+d\,x)^3}{2}}\,{(c+d\,x)}^{m+1}\,\mathrm{M}_{\frac{1}{3}-\frac{m}{6},\frac{m}{6}+\frac{1}{6}}\left(b\,\ln\left(F\right)\,{(c+d\,x)}^3\right)}{d\,\left(m+1\right)\,{\left(b\,\ln\left(F\right)\,{(c+d\,x)}^3\right)}^{\frac{m}{6}+\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)*(c + d*x)^m,x)
```

```
[Out] (F^a*exp((b*log(F)*(c + d*x)^3)/2)*(c + d*x)^(m + 1)*whittakerM(1/3 - m/6,
m/6 + 1/6, b*log(F)*(c + d*x)^3))/(d*(m + 1)*(b*log(F)*(c + d*x)^3)^(m/6 +
2/3))
```

3.281 $\int F^{a+b(c+dx)^3}(c+dx)^{17}\,dx$

Optimal. Leaf size=105

$$-\frac{F^{a+b(c+dx)^3}\left(120-120b(c+dx)^3\log(F)+60b^2(c+dx)^6\log^2(F)-20b^3(c+dx)^9\log^3(F)+5b^4(c+dx)^{12}\log^4(F)-b^5(c+dx)^{15}\log^5(F)\right)}{3b^6d\log^6(F)}$$

```
[Out] -1/3*F^(a+b*(d*x+c)^3)*(120-120*b*(d*x+c)^3*ln(F)+60*b^2*(d*x+c)^6*ln(F)^2-
20*b^3*(d*x+c)^9*ln(F)^3+5*b^4*(d*x+c)^12*ln(F)^4-b^5*(d*x+c)^15*ln(F)^5)/b
^6/d/ln(F)^6
```

Rubi [A]
time = 0.08, antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2249}

$$-\frac{F^{a+b(c+dx)^3}\left(-b^5\log^5(F)(c+dx)^{15}+5b^4\log^4(F)(c+dx)^{12}-20b^3\log^3(F)(c+dx)^9+60b^2\log^2(F)(c+dx)^6-120b\log(F)(c+dx)^3+120\right)}{3b^6d\log^6(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)*(c + d*x)^17,x]
```

```
[Out] -1/3*(F^(a + b*(c + d*x)^3)*(120 - 120*b*(c + d*x)^3*Log[F] + 60*b^2*(c + d
*x)^6*Log[F]^2 - 20*b^3*(c + d*x)^9*Log[F]^3 + 5*b^4*(c + d*x)^12*Log[F]^4
- b^5*(c + d*x)^15*Log[F]^5))/(b^6*d*Log[F]^6)
```

Rule 2249

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> With[{p = Simplify[(m + 1)/n]}, Simp[(-F^a)*((f/d)^m/(d*n*
((-b)*Log[F])^p))*Simplify[FunctionExpand[Gamma[p, (-b)*(c + d*x)^n*Log[F]]
]], x] /; IGtQ[p, 0]] /; FreeQ[{F, a, b, c, d, e, f, m, n}, x] && EqQ[d*e -
 c*f, 0] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\int F^{a+b(c+dx)^3}(c+dx)^{17}\,dx=-\frac{F^a\Gamma(6,-b(c+dx)^3\log(F))}{3b^6d\log^6(F)}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.52, size = 31, normalized size = 0.30

$$-\frac{F^a\Gamma(6,-b(c+dx)^3\log(F))}{3b^6d\log^6(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)*(c + d*x)^17,x]
```

```
[Out] -1/3*(F^a*Gamma[6, -(b*(c + d*x)^3*Log[F])])/(b^6*d*Log[F]^6)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 856 vs. $2(103) = 206$.
time = 0.10, size = 857, normalized size = 8.16 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^3)*(d*x+c)^17,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*(-120+120*ln(F)*b*c^3+120*ln(F)*b*d^3*x^3+360*ln(F)*b*c*d^2*x^2+360*ln(
F)*b*c^2*d*x+15*d^14*c*x^14*ln(F)^5*b^5+105*d^13*c^2*x^13*ln(F)^5*b^5+455*l
n(F)^5*b^5*c^3*d^12*x^12+1365*ln(F)^5*b^5*c^4*d^11*x^11+3003*ln(F)^5*b^5*c^
5*d^10*x^10+5005*ln(F)^5*b^5*c^6*d^9*x^9+6435*ln(F)^5*b^5*c^7*d^8*x^8+6435*
ln(F)^5*b^5*c^8*d^7*x^7+5005*ln(F)^5*b^5*c^9*d^6*x^6-60*c*d^11*x^11*ln(F)^4
*b^4+3003*ln(F)^5*b^5*c^10*d^5*x^5-330*c^2*d^10*x^10*ln(F)^4*b^4+1365*ln(F)
^5*b^5*c^11*d^4*x^4-1100*ln(F)^4*b^4*c^3*d^9*x^9+455*ln(F)^5*b^5*c^12*d^3*x
^3-2475*ln(F)^4*b^4*c^4*d^8*x^8+105*ln(F)^5*b^5*c^13*d^2*x^2-3960*ln(F)^4*b
^4*c^5*d^7*x^7+15*ln(F)^5*b^5*c^14*d*x-4620*ln(F)^4*b^4*c^6*d^6*x^6-3960*ln
(F)^4*b^4*c^7*d^5*x^5-2475*ln(F)^4*b^4*c^8*d^4*x^4-1100*ln(F)^4*b^4*c^9*d^3
*x^3+180*c*d^8*x^8*ln(F)^3*b^3-330*ln(F)^4*b^4*c^10*d^2*x^2+720*c^2*d^7*x^7
*ln(F)^3*b^3-60*ln(F)^4*b^4*c^11*d*x+1680*ln(F)^3*b^3*c^3*d^6*x^6+2520*ln(F
)^3*b^3*c^4*d^5*x^5+2520*ln(F)^3*b^3*c^5*d^4*x^4+1680*ln(F)^3*b^3*c^6*d^3*x
^3+720*ln(F)^3*b^3*c^7*d^2*x^2+180*ln(F)^3*b^3*c^8*d*x-360*c*d^5*x^5*ln(F)^
2*b^2-900*c^2*d^4*x^4*ln(F)^2*b^2-1200*ln(F)^2*b^2*c^3*d^3*x^3-900*ln(F)^2*
b^2*c^4*d^2*x^2-360*ln(F)^2*b^2*c^5*d*x+ln(F)^5*b^5*c^15-5*ln(F)^4*b^4*c^12
+20*ln(F)^3*b^3*c^9-60*ln(F)^2*b^2*c^6+d^15*x^15*ln(F)^5*b^5-5*d^12*x^12*ln
(F)^4*b^4+20*d^9*x^9*ln(F)^3*b^3-60*d^6*x^6*ln(F)^2*b^2)*F^(b*d^3*x^3+3*b*c
*d^2*x^2+3*b*c^2*d*x+b*c^3+a)/ln(F)^6/b^6/d
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 1268 vs. $2(102) = 204$.
time = 0.41, size = 1268, normalized size = 12.08

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^17,x, algorithm="maxima")
```

```
[Out] 1/3*(F^(b*c^3 + a)*b^5*d^15*x^15*log(F)^5 + 15*F^(b*c^3 + a)*b^5*c*d^14*x^1
4*log(F)^5 + 105*F^(b*c^3 + a)*b^5*c^2*d^13*x^13*log(F)^5 + F^(b*c^3 + a)*b
^5*c^15*log(F)^5 - 5*F^(b*c^3 + a)*b^4*c^12*log(F)^4 + 20*F^(b*c^3 + a)*b^3
*c^9*log(F)^3 + 5*(91*F^(b*c^3 + a)*b^5*c^3*d^12*log(F)^5 - F^(b*c^3 + a)*b
^4*d^12*log(F)^4)*x^12 + 15*(91*F^(b*c^3 + a)*b^5*c^4*d^11*log(F)^5 - 4*F^(
```

```
b*c^3 + a)*b^4*c*d^11*log(F)^4)*x^11 + 33*(91*F^(b*c^3 + a)*b^5*c^5*d^10*lo
g(F)^5 - 10*F^(b*c^3 + a)*b^4*c^2*d^10*log(F)^4)*x^10 - 60*F^(b*c^3 + a)*b^
2*c^6*log(F)^2 + 5*(1001*F^(b*c^3 + a)*b^5*c^6*d^9*log(F)^5 - 220*F^(b*c^3
+ a)*b^4*c^3*d^9*log(F)^4 + 4*F^(b*c^3 + a)*b^3*d^9*log(F)^3)*x^9 + 45*(143
*F^(b*c^3 + a)*b^5*c^7*d^8*log(F)^5 - 55*F^(b*c^3 + a)*b^4*c^4*d^8*log(F)^4
 + 4*F^(b*c^3 + a)*b^3*c*d^8*log(F)^3)*x^8 + 45*(143*F^(b*c^3 + a)*b^5*c^8*
d^7*log(F)^5 - 88*F^(b*c^3 + a)*b^4*c^5*d^7*log(F)^4 + 16*F^(b*c^3 + a)*b^3
*c^2*d^7*log(F)^3)*x^7 + 5*(1001*F^(b*c^3 + a)*b^5*c^9*d^6*log(F)^5 - 924*F
^(b*c^3 + a)*b^4*c^6*d^6*log(F)^4 + 336*F^(b*c^3 + a)*b^3*c^3*d^6*log(F)^3
- 12*F^(b*c^3 + a)*b^2*d^6*log(F)^2)*x^6 + 3*(1001*F^(b*c^3 + a)*b^5*c^10*d
^5*log(F)^5 - 1320*F^(b*c^3 + a)*b^4*c^7*d^5*log(F)^4 + 840*F^(b*c^3 + a)*b
^3*c^4*d^5*log(F)^3 - 120*F^(b*c^3 + a)*b^2*c*d^5*log(F)^2)*x^5 + 120*F^(b*
c^3 + a)*b*c^3*log(F) + 15*(91*F^(b*c^3 + a)*b^5*c^11*d^4*log(F)^5 - 165*F^
(b*c^3 + a)*b^4*c^8*d^4*log(F)^4 + 168*F^(b*c^3 + a)*b^3*c^5*d^4*log(F)^3 -
 60*F^(b*c^3 + a)*b^2*c^2*d^4*log(F)^2)*x^4 + 5*(91*F^(b*c^3 + a)*b^5*c^12*
d^3*log(F)^5 - 220*F^(b*c^3 + a)*b^4*c^9*d^3*log(F)^4 + 336*F^(b*c^3 + a)*b
^3*c^6*d^3*log(F)^3 - 240*F^(b*c^3 + a)*b^2*c^3*d^3*log(F)^2 + 24*F^(b*c^3
+ a)*b*d^3*log(F))*x^3 + 15*(7*F^(b*c^3 + a)*b^5*c^13*d^2*log(F)^5 - 22*F^(
b*c^3 + a)*b^4*c^10*d^2*log(F)^4 + 48*F^(b*c^3 + a)*b^3*c^7*d^2*log(F)^3 -
60*F^(b*c^3 + a)*b^2*c^4*d^2*log(F)^2 + 24*F^(b*c^3 + a)*b*c*d^2*log(F))*x^
2 + 15*(F^(b*c^3 + a)*b^5*c^14*d*log(F)^5 - 4*F^(b*c^3 + a)*b^4*c^11*d*log(
F)^4 + 12*F^(b*c^3 + a)*b^3*c^8*d*log(F)^3 - 24*F^(b*c^3 + a)*b^2*c^5*d*log
(F)^2 + 24*F^(b*c^3 + a)*b*c^2*d*log(F))*x - 120*F^(b*c^3 + a))*e^(b*d^3*x^
3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F))/(b^6*d*log(F)^6)
```

Fricas [**B**] Leaf count of result is larger than twice the leaf count of optimal. 688 vs. $2(102) = 204$.
time = 0.40, size = 688, normalized size = 6.55

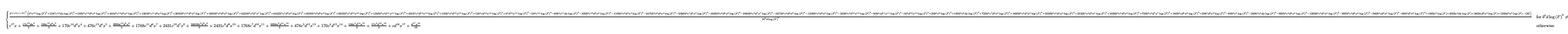
Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^17,x, algorithm="fricas")
```

```
[Out] 1/3*((b^5*d^15*x^15 + 15*b^5*c*d^14*x^14 + 105*b^5*c^2*d^13*x^13 + 455*b^5*
c^3*d^12*x^12 + 1365*b^5*c^4*d^11*x^11 + 3003*b^5*c^5*d^10*x^10 + 5005*b^5*
c^6*d^9*x^9 + 6435*b^5*c^7*d^8*x^8 + 6435*b^5*c^8*d^7*x^7 + 5005*b^5*c^9*d^
6*x^6 + 3003*b^5*c^10*d^5*x^5 + 1365*b^5*c^11*d^4*x^4 + 455*b^5*c^12*d^3*x^
3 + 105*b^5*c^13*d^2*x^2 + 15*b^5*c^14*d*x + b^5*c^15)*log(F)^5 - 5*(b^4*d^
12*x^12 + 12*b^4*c*d^11*x^11 + 66*b^4*c^2*d^10*x^10 + 220*b^4*c^3*d^9*x^9 +
 495*b^4*c^4*d^8*x^8 + 792*b^4*c^5*d^7*x^7 + 924*b^4*c^6*d^6*x^6 + 792*b^4*
c^7*d^5*x^5 + 495*b^4*c^8*d^4*x^4 + 220*b^4*c^9*d^3*x^3 + 66*b^4*c^10*d^2*x
^2 + 12*b^4*c^11*d*x + b^4*c^12)*log(F)^4 + 20*(b^3*d^9*x^9 + 9*b^3*c*d^8*x
^8 + 36*b^3*c^2*d^7*x^7 + 84*b^3*c^3*d^6*x^6 + 126*b^3*c^4*d^5*x^5 + 126*b^
3*c^5*d^4*x^4 + 84*b^3*c^6*d^3*x^3 + 36*b^3*c^7*d^2*x^2 + 9*b^3*c^8*d*x + b
```

```
^3*c^9)*log(F)^3 - 60*(b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 +
 20*b^2*c^3*d^3*x^3 + 15*b^2*c^4*d^2*x^2 + 6*b^2*c^5*d*x + b^2*c^6)*log(F)^
2 + 120*(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F) - 120)*F^(
b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)/(b^6*d*log(F)^6)
```

Sympy [**B**] Leaf count of result is larger than twice the leaf count of optimal. 1170 vs. $2(105) = 210$.
time = 0.38, size = 1170, normalized size = 11.14



Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)*(d*x+c)**17,x)
```

```
[Out] Piecewise((F**(a + b*(c + d*x)**3)*(b**5*c**15*log(F)**5 + 15*b**5*c**14*d*
x*log(F)**5 + 105*b**5*c**13*d**2*x**2*log(F)**5 + 455*b**5*c**12*d**3*x**3
*log(F)**5 + 1365*b**5*c**11*d**4*x**4*log(F)**5 + 3003*b**5*c**10*d**5*x**
5*log(F)**5 + 5005*b**5*c**9*d**6*x**6*log(F)**5 + 6435*b**5*c**8*d**7*x**7
*log(F)**5 + 6435*b**5*c**7*d**8*x**8*log(F)**5 + 5005*b**5*c**6*d**9*x**9*
log(F)**5 + 3003*b**5*c**5*d**10*x**10*log(F)**5 + 1365*b**5*c**4*d**11*x**
11*log(F)**5 + 455*b**5*c**3*d**12*x**12*log(F)**5 + 105*b**5*c**2*d**13*x*
*13*log(F)**5 + 15*b**5*c*d**14*x**14*log(F)**5 + b**5*d**15*x**15*log(F)**
5 - 5*b**4*c**12*log(F)**4 - 60*b**4*c**11*d*x*log(F)**4 - 330*b**4*c**10*d
**2*x**2*log(F)**4 - 1100*b**4*c**9*d**3*x**3*log(F)**4 - 2475*b**4*c**8*d*
*4*x**4*log(F)**4 - 3960*b**4*c**7*d**5*x**5*log(F)**4 - 4620*b**4*c**6*d**
6*x**6*log(F)**4 - 3960*b**4*c**5*d**7*x**7*log(F)**4 - 2475*b**4*c**4*d**8
*x**8*log(F)**4 - 1100*b**4*c**3*d**9*x**9*log(F)**4 - 330*b**4*c**2*d**10*
x**10*log(F)**4 - 60*b**4*c*d**11*x**11*log(F)**4 - 5*b**4*d**12*x**12*log(
F)**4 + 20*b**3*c**9*log(F)**3 + 180*b**3*c**8*d*x*log(F)**3 + 720*b**3*c**
7*d**2*x**2*log(F)**3 + 1680*b**3*c**6*d**3*x**3*log(F)**3 + 2520*b**3*c**5
*d**4*x**4*log(F)**3 + 2520*b**3*c**4*d**5*x**5*log(F)**3 + 1680*b**3*c**3*
d**6*x**6*log(F)**3 + 720*b**3*c**2*d**7*x**7*log(F)**3 + 180*b**3*c*d**8*x
**8*log(F)**3 + 20*b**3*d**9*x**9*log(F)**3 - 60*b**2*c**6*log(F)**2 - 360*
b**2*c**5*d*x*log(F)**2 - 900*b**2*c**4*d**2*x**2*log(F)**2 - 1200*b**2*c**
3*d**3*x**3*log(F)**2 - 900*b**2*c**2*d**4*x**4*log(F)**2 - 360*b**2*c*d**5
*x**5*log(F)**2 - 60*b**2*d**6*x**6*log(F)**2 + 120*b*c**3*log(F) + 360*b*c
**2*d*x*log(F) + 360*b*c*d**2*x**2*log(F) + 120*b*d**3*x**3*log(F) - 120)/(
3*b**6*d*log(F)**6), Ne(b**6*d*log(F)**6, 0)), (c**17*x + 17*c**16*d*x**2/2
 + 136*c**15*d**2*x**3/3 + 170*c**14*d**3*x**4 + 476*c**13*d**4*x**5 + 3094
*c**12*d**5*x**6/3 + 1768*c**11*d**6*x**7 + 2431*c**10*d**7*x**8 + 24310*c*
*9*d**8*x**9/9 + 2431*c**8*d**9*x**10 + 1768*c**7*d**10*x**11 + 3094*c**6*d
**11*x**12/3 + 476*c**5*d**12*x**13 + 170*c**4*d**13*x**14 + 136*c**3*d**14
*x**15/3 + 17*c**2*d**15*x**16/2 + c*d**16*x**17 + d**17*x**18/18, True))
```

Giac [**F(-2)**]

time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^17,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:Polynomial exponent overflow. Error:
Bad Argument Value
```

Mupad [B]
time = 4.37, size = 685, normalized size = 6.52

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)*(c + d*x)^17,x)
```

```
[Out] F^(b*d^3*x^3)*F^(3*b*c^2*d*x)*F^a*F^(b*c^3)*F^(3*b*c*d^2*x^2)*((120*b*c^3*l
og(F) - 60*b^2*c^6*log(F)^2 + 20*b^3*c^9*log(F)^3 - 5*b^4*c^12*log(F)^4 + b
^5*c^15*log(F)^5 - 120)/(3*b^6*d*log(F)^6) + (d^14*x^15)/(3*b*log(F)) + (5*
c*d^13*x^14)/(b*log(F)) + (5*d^2*x^3*(336*b^2*c^6*log(F)^2 - 240*b*c^3*log(
F) - 220*b^3*c^9*log(F)^3 + 91*b^4*c^12*log(F)^4 + 24))/(3*b^5*log(F)^5) +
(5*d^5*x^6*(336*b*c^3*log(F) - 924*b^2*c^6*log(F)^2 + 1001*b^3*c^9*log(F)^3
 - 12))/(3*b^4*log(F)^4) + (5*d^8*x^9*(1001*b^2*c^6*log(F)^2 - 220*b*c^3*lo
g(F) + 4))/(3*b^3*log(F)^3) + (5*d^11*x^12*(91*b*c^3*log(F) - 1))/(3*b^2*lo
g(F)^2) + (35*c^2*d^12*x^13)/(b*log(F)) + (5*c^2*x*(12*b^2*c^6*log(F)^2 - 2
4*b*c^3*log(F) - 4*b^3*c^9*log(F)^3 + b^4*c^12*log(F)^4 + 24))/(b^5*log(F)^
5) + (5*c^2*d^3*x^4*(168*b*c^3*log(F) - 165*b^2*c^6*log(F)^2 + 91*b^3*c^9*l
og(F)^3 - 60))/(b^4*log(F)^4) + (15*c^2*d^6*x^7*(143*b^2*c^6*log(F)^2 - 88*
b*c^3*log(F) + 16))/(b^3*log(F)^3) + (11*c^2*d^9*x^10*(91*b*c^3*log(F) - 10
))/(b^2*log(F)^2) + (5*c*d*x^2*(48*b^2*c^6*log(F)^2 - 60*b*c^3*log(F) - 22*
b^3*c^9*log(F)^3 + 7*b^4*c^12*log(F)^4 + 24))/(b^5*log(F)^5) + (c*d^4*x^5*(
840*b*c^3*log(F) - 1320*b^2*c^6*log(F)^2 + 1001*b^3*c^9*log(F)^3 - 120))/(b
^4*log(F)^4) + (15*c*d^7*x^8*(143*b^2*c^6*log(F)^2 - 55*b*c^3*log(F) + 4))/
(b^3*log(F)^3) + (5*c*d^10*x^11*(91*b*c^3*log(F) - 4))/(b^2*log(F)^2))
```

3.282 $\int F^{a+b(c+dx)^3}(c+dx)^{14}\,dx$

Optimal. Leaf size=88

$$\frac{F^{a+b(c+dx)^3}\left(24-24b(c+dx)^3\log(F)+12b^2(c+dx)^6\log^2(F)-4b^3(c+dx)^9\log^3(F)+b^4(c+dx)^{12}\log^4(F\right.}{3b^5d\log^5(F)}$$

```
[Out] 1/3*F^(a+b*(d*x+c)^3)*(24-24*b*(d*x+c)^3*ln(F)+12*b^2*(d*x+c)^6*ln(F)^2-4*b
^3*(d*x+c)^9*ln(F)^3+b^4*(d*x+c)^12*ln(F)^4)/b^5/d/ln(F)^5
```

Rubi [A]
time = 0.08, antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2249}

$$\frac{F^{a+b(c+dx)^3}\left(b^4\log^4(F)(c+dx)^{12}-4b^3\log^3(F)(c+dx)^9+12b^2\log^2(F)(c+dx)^6-24b\log(F)(c+dx)^3+24\right)}{3b^5d\log^5(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)*(c + d*x)^14,x]
```

```
[Out] (F^(a + b*(c + d*x)^3)*(24 - 24*b*(c + d*x)^3*Log[F] + 12*b^2*(c + d*x)^6*L
og[F]^2 - 4*b^3*(c + d*x)^9*Log[F]^3 + b^4*(c + d*x)^12*Log[F]^4))/(3*b^5*d
*Log[F]^5)
```

Rule 2249

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> With[{p = Simplify[(m + 1)/n]}, Simp[(-F^a)*((f/d)^m/(d*n*
((-b)*Log[F])^p))*Simplify[FunctionExpand[Gamma[p, (-b)*(c + d*x)^n*Log[F]]
]], x] /; IGtQ[p, 0]] /; FreeQ[{F, a, b, c, d, e, f, m, n}, x] && EqQ[d*e -
 c*f, 0] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\int F^{a+b(c+dx)^3}(c+dx)^{14}\,dx=\frac{F^a\Gamma(5,-b(c+dx)^3\log(F))}{3b^5d\log^5(F)}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.49, size = 31, normalized size = 0.35

$$\frac{F^a\Gamma(5,-b(c+dx)^3\log(F))}{3b^5d\log^5(F)}$$

Antiderivative was successfully verified.

[In] Integrate[F^(a + b*(c + d*x)^3)*(c + d*x)^14,x]

[Out] (F^a*Gamma[5, -(b*(c + d*x)^3*Log[F])])/(3*b^5*d*Log[F]^5)

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 583 vs. $2(86) = 172$.
time = 0.08, size = 584, normalized size = 6.64 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a+b*(d*x+c)^3)*(d*x+c)^14,x,method=_RETURNVERBOSE)

[Out] 1/3*(24-24*ln(F)*b*c^3-24*ln(F)*b*d^3*x^3-72*ln(F)*b*c*d^2*x^2-72*ln(F)*b*c^2*d*x+12*c*d^11*x^11*ln(F)^4*b^4+66*c^2*d^10*x^10*ln(F)^4*b^4+220*ln(F)^4*b^4*c^3*d^9*x^9+495*ln(F)^4*b^4*c^4*d^8*x^8+792*ln(F)^4*b^4*c^5*d^7*x^7+924*ln(F)^4*b^4*c^6*d^6*x^6+792*ln(F)^4*b^4*c^7*d^5*x^5+495*ln(F)^4*b^4*c^8*d^4*x^4+220*ln(F)^4*b^4*c^9*d^3*x^3-36*c*d^8*x^8*ln(F)^3*b^3+66*ln(F)^4*b^4*c^10*d^2*x^2-144*c^2*d^7*x^7*ln(F)^3*b^3+12*ln(F)^4*b^4*c^11*d*x-336*ln(F)^3*b^3*c^3*d^6*x^6-504*ln(F)^3*b^3*c^4*d^5*x^5-504*ln(F)^3*b^3*c^5*d^4*x^4-336*ln(F)^3*b^3*c^6*d^3*x^3-144*ln(F)^3*b^3*c^7*d^2*x^2-36*ln(F)^3*b^3*c^8*d*x+72*c*d^5*x^5*ln(F)^2*b^2+180*c^2*d^4*x^4*ln(F)^2*b^2+240*ln(F)^2*b^2*c^3*d^3*x^3+180*ln(F)^2*b^2*c^4*d^2*x^2+72*ln(F)^2*b^2*c^5*d*x+ln(F)^4*b^4*c^12-4*ln(F)^3*b^3*c^9+12*ln(F)^2*b^2*c^6+d^12*x^12*ln(F)^4*b^4-4*d^9*x^9*ln(F)^3*b^3+12*d^6*x^6*ln(F)^2*b^2)*F^(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)/d/ln(F)^5/b^5

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 874 vs. $2(86) = 172$.
time = 0.39, size = 874, normalized size = 9.93

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^14,x, algorithm="maxima")

[Out] 1/3*(F^(b*c^3 + a)*b^4*d^12*x^12*log(F)^4 + 12*F^(b*c^3 + a)*b^4*c*d^11*x^11*log(F)^4 + 66*F^(b*c^3 + a)*b^4*c^2*d^10*x^10*log(F)^4 + F^(b*c^3 + a)*b^4*c^12*log(F)^4 - 4*F^(b*c^3 + a)*b^3*c^9*log(F)^3 + 12*F^(b*c^3 + a)*b^2*c^6*log(F)^2 + 4*(55*F^(b*c^3 + a)*b^4*c^3*d^9*log(F)^4 - F^(b*c^3 + a)*b^3*d^9*log(F)^3)*x^9 + 9*(55*F^(b*c^3 + a)*b^4*c^4*d^8*log(F)^4 - 4*F^(b*c^3 + a)*b^3*c*d^8*log(F)^3)*x^8 + 72*(11*F^(b*c^3 + a)*b^4*c^5*d^7*log(F)^4 - 2*F^(b*c^3 + a)*b^3*c^2*d^7*log(F)^3)*x^7 + 12*(77*F^(b*c^3 + a)*b^4*c^6*d^6*log(F)^4 - 28*F^(b*c^3 + a)*b^3*c^3*d^6*log(F)^3 + F^(b*c^3 + a)*b^2*d^6*log(F)^2)*x^6 + 72*(11*F^(b*c^3 + a)*b^4*c^7*d^5*log(F)^4 - 7*F^(b*c^3 + a)*b^3*c^4*d^5*log(F)^3 + F^(b*c^3 + a)*b^2*c*d^5*log(F)^2)*x^5 - 24*F^(b*c^3 + a)*b*c^3*log(F) + 9*(55*F^(b*c^3 + a)*b^4*c^8*d^4*log(F)^4 - 56*F^(b*c^3

```
+ a)*b^3*c^5*d^4*log(F)^3 + 20*F^(b*c^3 + a)*b^2*c^2*d^4*log(F)^2)*x^4 + 4*
(55*F^(b*c^3 + a)*b^4*c^9*d^3*log(F)^4 - 84*F^(b*c^3 + a)*b^3*c^6*d^3*log(F
)^3 + 60*F^(b*c^3 + a)*b^2*c^3*d^3*log(F)^2 - 6*F^(b*c^3 + a)*b*d^3*log(F))
*x^3 + 6*(11*F^(b*c^3 + a)*b^4*c^10*d^2*log(F)^4 - 24*F^(b*c^3 + a)*b^3*c^7
*d^2*log(F)^3 + 30*F^(b*c^3 + a)*b^2*c^4*d^2*log(F)^2 - 12*F^(b*c^3 + a)*b*
c*d^2*log(F))*x^2 + 12*(F^(b*c^3 + a)*b^4*c^11*d*log(F)^4 - 3*F^(b*c^3 + a)
*b^3*c^8*d*log(F)^3 + 6*F^(b*c^3 + a)*b^2*c^5*d*log(F)^2 - 6*F^(b*c^3 + a)*
b*c^2*d*log(F))*x + 24*F^(b*c^3 + a))*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*l
og(F) + 3*b*c^2*d*x*log(F))/(b^5*d*log(F)^5)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 474 vs. $2(86) = 172$.
time = 0.37, size = 474, normalized size = 5.39

$$\frac{\left(\left(b^4d^{12}x^{12}+12\,b^4cd^{11}x^{11}+66\,b^4c^2d^{10}x^{10}+220\,b^4c^3d^9x^9+495\,b^4c^4d^8x^8+792\,b^4c^5d^7x^7+924\,b^4c^6d^6x^6+792\,b^4c^7d^5x^5+495\,b^4c^8d^4x^4+220\,b^4c^9d^3x^3+66\,b^4c^{10}d^2x^2+12\,b^4c^{11}dx+b^4c^{12}\right)\log(F)^4-4\left(b^3d^9x^9+9\,b^3cd^8x^8+36\,b^3c^2d^7x^7+84\,b^3c^3d^6x^6+126\,b^3c^4d^5x^5+126\,b^3c^5d^4x^4+84\,b^3c^6d^3x^3+36\,b^3c^7d^2x^2+9\,b^3c^8dx+b^3c^9\right)\log(F)^3+12\left(b^2d^6x^6+6\,b^2cd^5x^5+15\,b^2c^2d^4x^4+20\,b^2c^3d^3x^3+15\,b^2c^4d^2x^2+6\,b^2c^5dx+b^2c^6\right)\log(F)^2-24\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3\right)\log(F)+24\right)F^{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}}{3\,b^5d\log(F)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^14,x, algorithm="fricas")
```

```
[Out] 1/3*((b^4*d^12*x^12 + 12*b^4*c*d^11*x^11 + 66*b^4*c^2*d^10*x^10 + 220*b^4*c
^3*d^9*x^9 + 495*b^4*c^4*d^8*x^8 + 792*b^4*c^5*d^7*x^7 + 924*b^4*c^6*d^6*x^
6 + 792*b^4*c^7*d^5*x^5 + 495*b^4*c^8*d^4*x^4 + 220*b^4*c^9*d^3*x^3 + 66*b^
4*c^10*d^2*x^2 + 12*b^4*c^11*d*x + b^4*c^12)*log(F)^4 - 4*(b^3*d^9*x^9 + 9*
b^3*c*d^8*x^8 + 36*b^3*c^2*d^7*x^7 + 84*b^3*c^3*d^6*x^6 + 126*b^3*c^4*d^5*x
^5 + 126*b^3*c^5*d^4*x^4 + 84*b^3*c^6*d^3*x^3 + 36*b^3*c^7*d^2*x^2 + 9*b^3*
c^8*d*x + b^3*c^9)*log(F)^3 + 12*(b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^
2*d^4*x^4 + 20*b^2*c^3*d^3*x^3 + 15*b^2*c^4*d^2*x^2 + 6*b^2*c^5*d*x + b^2*c
^6)*log(F)^2 - 24*(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F)
+ 24)*F^(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)/(b^5*d*log(F)
^5)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 821 vs. $2(87) = 174$.
time = 0.29, size = 821, normalized size = 9.33

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)*(d*x+c)**14,x)
```

```
[Out] Piecewise((F**(a + b*(c + d*x)**3)*(b**4*c**12*log(F)**4 + 12*b**4*c**11*d*
x*log(F)**4 + 66*b**4*c**10*d**2*x**2*log(F)**4 + 220*b**4*c**9*d**3*x**3*l
og(F)**4 + 495*b**4*c**8*d**4*x**4*log(F)**4 + 792*b**4*c**7*d**5*x**5*log(
F)**4 + 924*b**4*c**6*d**6*x**6*log(F)**4 + 792*b**4*c**5*d**7*x**7*log(F)*
*4 + 495*b**4*c**4*d**8*x**8*log(F)**4 + 220*b**4*c**3*d**9*x**9*log(F)**4
+ 66*b**4*c**2*d**10*x**10*log(F)**4 + 12*b**4*c*d**11*x**11*log(F)**4 + b*
```

```
*4*d**12*x**12*log(F)**4 - 4*b**3*c**9*log(F)**3 - 36*b**3*c**8*d*x*log(F)*
*3 - 144*b**3*c**7*d**2*x**2*log(F)**3 - 336*b**3*c**6*d**3*x**3*log(F)**3
- 504*b**3*c**5*d**4*x**4*log(F)**3 - 504*b**3*c**4*d**5*x**5*log(F)**3 - 3
36*b**3*c**3*d**6*x**6*log(F)**3 - 144*b**3*c**2*d**7*x**7*log(F)**3 - 36*b
**3*c*d**8*x**8*log(F)**3 - 4*b**3*d**9*x**9*log(F)**3 + 12*b**2*c**6*log(F
)**2 + 72*b**2*c**5*d*x*log(F)**2 + 180*b**2*c**4*d**2*x**2*log(F)**2 + 240
*b**2*c**3*d**3*x**3*log(F)**2 + 180*b**2*c**2*d**4*x**4*log(F)**2 + 72*b**
2*c*d**5*x**5*log(F)**2 + 12*b**2*d**6*x**6*log(F)**2 - 24*b*c**3*log(F) -
72*b*c**2*d*x*log(F) - 72*b*c*d**2*x**2*log(F) - 24*b*d**3*x**3*log(F) + 24
)/(3*b**5*d*log(F)**5), Ne(b**5*d*log(F)**5, 0)), (c**14*x + 7*c**13*d*x**2
 + 91*c**12*d**2*x**3/3 + 91*c**11*d**3*x**4 + 1001*c**10*d**4*x**5/5 + 100
1*c**9*d**5*x**6/3 + 429*c**8*d**6*x**7 + 429*c**7*d**7*x**8 + 1001*c**6*d*
*8*x**9/3 + 1001*c**5*d**9*x**10/5 + 91*c**4*d**10*x**11 + 91*c**3*d**11*x*
*12/3 + 7*c**2*d**12*x**13 + c*d**13*x**14 + d**14*x**15/15, True))
```

Giac [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^14,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,sageVARx):;OUTPUT:Polynomial exponent overflow. Error:
Bad Argument Value
```

Mupad [**B**]
time = 4.08, size = 487, normalized size = 5.53

$$F^{b\,d^3\,x^3}\,F^{3\,b\,c^2\,d\,x}\,F^a\,F^{b\,c^3}\,F^{3\,b\,c\,d^2\,x^2}\,\left(\frac{b^4\,c^{12}\,\ln\left(F\right)^4-4\,b^3\,c^9\,\ln\left(F\right)^3+12\,b^2\,c^6\,\ln\left(F\right)^2-24\,b\,c^3\,\ln\left(F\right)+24}{3\,b^5\,d\,\ln\left(F\right)^5}+\frac{d^{11}\,x^{12}}{3\,b\,\ln\left(F\right)}+\frac{4\,c\,d^{10}\,x^{11}}{b\,\ln\left(F\right)}+\frac{4\,d^2\,x^3\,\left(55\,b^3\,c^9\,\ln\left(F\right)^3-84\,b^2\,c^6\,\ln\left(F\right)^2+60\,b\,c^3\,\ln\left(F\right)-6\right)}{3\,b^4\,\ln\left(F\right)^4}+\frac{4\,d^5\,x^6\,\left(77\,b^2\,c^6\,\ln\left(F\right)^2-28\,b\,c^3\,\ln\left(F\right)+1\right)}{b^3\,\ln\left(F\right)^3}+\frac{4\,d^8\,x^9\,\left(55\,b\,c^3\,\ln\left(F\right)-1\right)}{3\,b^2\,\ln\left(F\right)^2}+\frac{22\,c^2\,d^9\,x^{10}}{b\,\ln\left(F\right)}+\frac{4\,c^2\,x\,\left(b^3\,c^9\,\ln\left(F\right)^3-3\,b^2\,c^6\,\ln\left(F\right)^2+6\,b\,c^3\,\ln\left(F\right)-6\right)}{b^4\,\ln\left(F\right)^4}+\frac{3\,c^2\,d^3\,x^4\,\left(55\,b^2\,c^6\,\ln\left(F\right)^2-56\,b\,c^3\,\ln\left(F\right)+20\right)}{b^3\,\ln\left(F\right)^3}+\frac{24\,c^2\,d^6\,x^7\,\left(11\,b\,c^3\,\ln\left(F\right)-2\right)}{b^2\,\ln\left(F\right)^2}+\frac{2\,c\,d\,x^2\,\left(11\,b^3\,c^9\,\ln\left(F\right)^3-24\,b^2\,c^6\,\ln\left(F\right)^2+30\,b\,c^3\,\ln\left(F\right)-12\right)}{b^4\,\ln\left(F\right)^4}+\frac{24\,c\,d^4\,x^5\,\left(11\,b^2\,c^6\,\ln\left(F\right)^2-7\,b\,c^3\,\ln\left(F\right)+1\right)}{b^3\,\ln\left(F\right)^3}+\frac{3\,c\,d^7\,x^8\,\left(55\,b\,c^3\,\ln\left(F\right)-4\right)}{b^2\,\ln\left(F\right)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)*(c + d*x)^14,x)
```

```
[Out] F^(b*d^3*x^3)*F^(3*b*c^2*d*x)*F^a*F^(b*c^3)*F^(3*b*c*d^2*x^2)*((12*b^2*c^6*
log(F)^2 - 24*b*c^3*log(F) - 4*b^3*c^9*log(F)^3 + b^4*c^12*log(F)^4 + 24)/(
3*b^5*d*log(F)^5) + (d^11*x^12)/(3*b*log(F)) + (4*c*d^10*x^11)/(b*log(F)) +
 (4*d^2*x^3*(60*b*c^3*log(F) - 84*b^2*c^6*log(F)^2 + 55*b^3*c^9*log(F)^3 -
6))/(3*b^4*log(F)^4) + (4*d^5*x^6*(77*b^2*c^6*log(F)^2 - 28*b*c^3*log(F) +
1))/(b^3*log(F)^3) + (4*d^8*x^9*(55*b*c^3*log(F) - 1))/(3*b^2*log(F)^2) + (
22*c^2*d^9*x^10)/(b*log(F)) + (4*c^2*x*(6*b*c^3*log(F) - 3*b^2*c^6*log(F)^2
 + b^3*c^9*log(F)^3 - 6))/(b^4*log(F)^4) + (3*c^2*d^3*x^4*(55*b^2*c^6*log(F
)^2 - 56*b*c^3*log(F) + 20))/(b^3*log(F)^3) + (24*c^2*d^6*x^7*(11*b*c^3*log
(F) - 2))/(b^2*log(F)^2) + (2*c*d*x^2*(30*b*c^3*log(F) - 24*b^2*c^6*log(F)^
2 + 11*b^3*c^9*log(F)^3 - 12))/(b^4*log(F)^4) + (24*c*d^4*x^5*(11*b^2*c^6*l
og(F)^2 - 7*b*c^3*log(F) + 1))/(b^3*log(F)^3) + (3*c*d^7*x^8*(55*b*c^3*log(
F) - 4))/(b^2*log(F)^2))
```

3.283 $\int F^{a+b(c+dx)^3}(c+dx)^{11}\,dx$

Optimal. Leaf size=124

$$-\frac{2F^{a+b(c+dx)^3}}{b^4d\log^4(F)}+\frac{2F^{a+b(c+dx)^3}(c+dx)^3}{b^3d\log^3(F)}-\frac{F^{a+b(c+dx)^3}(c+dx)^6}{b^2d\log^2(F)}+\frac{F^{a+b(c+dx)^3}(c+dx)^9}{3bd\log(F)}$$

```
[Out] -2*F^(a+b*(d*x+c)^3)/b^4/d/ln(F)^4+2*F^(a+b*(d*x+c)^3)*(d*x+c)^3/b^3/d/ln(F
)^3-F^(a+b*(d*x+c)^3)*(d*x+c)^6/b^2/d/ln(F)^2+1/3*F^(a+b*(d*x+c)^3)*(d*x+c)
^9/b/d/ln(F)
```

Rubi [A]
time = 0.20, antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2243, 2240}

$$-\frac{2F^{a+b(c+dx)^3}}{b^4d\log^4(F)}+\frac{2(c+dx)^3F^{a+b(c+dx)^3}}{b^3d\log^3(F)}-\frac{(c+dx)^6F^{a+b(c+dx)^3}}{b^2d\log^2(F)}+\frac{(c+dx)^9F^{a+b(c+dx)^3}}{3bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)*(c + d*x)^11,x]
```

```
[Out] (-2*F^(a + b*(c + d*x)^3))/(b^4*d*Log[F]^4) + (2*F^(a + b*(c + d*x)^3)*(c +
 d*x)^3)/(b^3*d*Log[F]^3) - (F^(a + b*(c + d*x)^3)*(c + d*x)^6)/(b^2*d*Log[
F]^2) + (F^(a + b*(c + d*x)^3)*(c + d*x)^9)/(3*b*d*Log[F])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int F^{a+b(c+dx)^3}(c+dx)^{11}\,dx = \frac{F^{a+b(c+dx)^3}(c+dx)^9}{3bd\log(F)} - \frac{3\int F^{a+b(c+dx)^3}(c+dx)^8\,dx}{b\log(F)}$$
$$= -\frac{F^{a+b(c+dx)^3}(c+dx)^6}{b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^3}(c+dx)^9}{3bd\log(F)} + \frac{6\int F^{a+b(c+dx)^3}(c+dx)^5\,dx}{b^2\log^2(F)}$$
$$= \frac{2F^{a+b(c+dx)^3}(c+dx)^3}{b^3d\log^3(F)} - \frac{F^{a+b(c+dx)^3}(c+dx)^6}{b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^3}(c+dx)^9}{3bd\log(F)} - \frac{6\int F^{a}}{}$$
$$= -\frac{2F^{a+b(c+dx)^3}}{b^4d\log^4(F)} + \frac{2F^{a+b(c+dx)^3}(c+dx)^3}{b^3d\log^3(F)} - \frac{F^{a+b(c+dx)^3}(c+dx)^6}{b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^3}(c}{3bd\log(}$$

Mathematica [A]
time = 0.40, size = 75, normalized size = 0.60

$$\frac{F^{a+b(c+dx)^3}\left(-3b^2(c+dx)^6\log^2(F)+b^3(c+dx)^9\log^3(F)-6(1-b(c+dx)^3\log(F))\right)}{3b^4d\log^4(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)*(c + d*x)^11,x]
```

```
[Out] (F^(a + b*(c + d*x)^3)*(-3*b^2*(c + d*x)^6*Log[F]^2 + b^3*(c + d*x)^9*Log[F
]^3 - 6*(1 - b*(c + d*x)^3*Log[F])))/(3*b^4*d*Log[F]^4)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 364 vs. 2(122) = 244.
time = 0.07, size = 365, normalized size = 2.94

method	result
gosper	$\frac{\left(d^9x^9\ln(F)^3b^3+9c\,d^8x^8\ln(F)^3b^3+36c^2d^7x^7\ln(F)^3b^3+84\ln(F)^3b^3c^3d^6x^6+126\ln(F)^3b^3c^4d^5x^5+126\ln(F)^3b^3c^5d^4x^4+84\ln(F)^3b^3c^6\right.}{}$
risch	$\frac{\left(d^9x^9\ln(F)^3b^3+9c\,d^8x^8\ln(F)^3b^3+36c^2d^7x^7\ln(F)^3b^3+84\ln(F)^3b^3c^3d^6x^6+126\ln(F)^3b^3c^4d^5x^5+126\ln(F)^3b^3c^5d^4x^4+84\ln(F)^3b^3c^6\right.}{}$
norman	$\frac{d^5(28\ln(F)b\,c^3-1)x^6\mathrm{e}^{\left(a+b(dx+c)^3\right)\ln(F)}}{\ln(F)^2b^2}+\frac{\left(\ln(F)^3b^3c^9-3\ln(F)^2b^2c^6+6\ln(F)b\,c^3-6\right)\mathrm{e}^{\left(a+b(dx+c)^3\right)\ln(F)}}{3\ln(F)^4b^4d}+\frac{d^8x^9\mathrm{e}^{\left(a+b(dx+c)^3\right)}}{3\ln(F)b}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^3)*(d*x+c)^11,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*(d^9*x^9*ln(F)^3*b^3+9*c*d^8*x^8*ln(F)^3*b^3+36*c^2*d^7*x^7*ln(F)^3*b^3
+84*ln(F)^3*b^3*c^3*d^6*x^6+126*ln(F)^3*b^3*c^4*d^5*x^5+126*ln(F)^3*b^3*c^5
*d^4*x^4+84*ln(F)^3*b^3*c^6*d^3*x^3+36*ln(F)^3*b^3*c^7*d^2*x^2+9*ln(F)^3*b^
3*c^8*d*x-3*d^6*x^6*ln(F)^2*b^2+ln(F)^3*b^3*c^9-18*c*d^5*x^5*ln(F)^2*b^2-45
```

```
*c^2*d^4*x^4*ln(F)^2*b^2-60*ln(F)^2*b^2*c^3*d^3*x^3-45*ln(F)^2*b^2*c^4*d^2*
x^2-18*ln(F)^2*b^2*c^5*d*x-3*ln(F)^2*b^2*c^6+6*ln(F)*b*d^3*x^3+18*ln(F)*b*c
*d^2*x^2+18*ln(F)*b*c^2*d*x+6*ln(F)*b*c^3-6)*F^(b*d^3*x^3+3*b*c*d^2*x^2+3*b
*c^2*d*x+b*c^3+a)/ln(F)^4/b^4/d
```

Maxima [**B**] Leaf count of result is larger than twice the leaf count of optimal. 555 vs. $2(122) = 244$.
time = 0.39, size = 555, normalized size = 4.48

$$\frac{\left(F^{bc^3+a}b^3d^9x^9\log(F)^3+9\,F^{bc^3+a}b^3cd^8x^8\log(F)^3+36\,F^{bc^3+a}b^3c^2d^7x^7\log(F)^3+F^{bc^3+a}b^3c^9\log(F)^3-3\,F^{bc^3+a}b^2c^6\log(F)^2+3\left(28\,F^{bc^3+a}b^3c^3d^6\log(F)^3-F^{bc^3+a}b^2d^6\log(F)^2\right)x^6+18\left(7\,F^{bc^3+a}b^3c^4d^5\log(F)^3-F^{bc^3+a}b^2cd^5\log(F)^2\right)x^5+6\,F^{bc^3+a}bc^3\log(F)+9\left(14\,F^{bc^3+a}b^3c^5d^4\log(F)^3-5\,F^{bc^3+a}b^2c^2d^4\log(F)^2\right)x^4+6\left(14\,F^{bc^3+a}b^3c^6d^3\log(F)^3-10\,F^{bc^3+a}b^2c^3d^3\log(F)^2+F^{bc^3+a}bd^3\log(F)\right)x^3+9\left(4\,F^{bc^3+a}b^3c^7d^2\log(F)^3-5\,F^{bc^3+a}b^2c^4d^2\log(F)^2+2\,F^{bc^3+a}bcd^2\log(F)\right)x^2+9\left(F^{bc^3+a}b^3c^8d\log(F)^3-2\,F^{bc^3+a}b^2c^5d\log(F)^2+2\,F^{bc^3+a}bc^2d\log(F)\right)x-6\,F^{bc^3+a}\right)e^{\left(bd^3x^3\log(F)+3\,bcd^2x^2\log(F)+3\,bc^2dx\log(F)\right)}}{3\,b^4d\log(F)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^11,x, algorithm="maxima")
```

```
[Out] 1/3*(F^(b*c^3 + a)*b^3*d^9*x^9*log(F)^3 + 9*F^(b*c^3 + a)*b^3*c*d^8*x^8*log
(F)^3 + 36*F^(b*c^3 + a)*b^3*c^2*d^7*x^7*log(F)^3 + F^(b*c^3 + a)*b^3*c^9*l
og(F)^3 - 3*F^(b*c^3 + a)*b^2*c^6*log(F)^2 + 3*(28*F^(b*c^3 + a)*b^3*c^3*d^
6*log(F)^3 - F^(b*c^3 + a)*b^2*d^6*log(F)^2)*x^6 + 18*(7*F^(b*c^3 + a)*b^3*
c^4*d^5*log(F)^3 - F^(b*c^3 + a)*b^2*c*d^5*log(F)^2)*x^5 + 6*F^(b*c^3 + a)*
b*c^3*log(F) + 9*(14*F^(b*c^3 + a)*b^3*c^5*d^4*log(F)^3 - 5*F^(b*c^3 + a)*b
^2*c^2*d^4*log(F)^2)*x^4 + 6*(14*F^(b*c^3 + a)*b^3*c^6*d^3*log(F)^3 - 10*F^
(b*c^3 + a)*b^2*c^3*d^3*log(F)^2 + F^(b*c^3 + a)*b*d^3*log(F))*x^3 + 9*(4*F
^(b*c^3 + a)*b^3*c^7*d^2*log(F)^3 - 5*F^(b*c^3 + a)*b^2*c^4*d^2*log(F)^2 +
2*F^(b*c^3 + a)*b*c*d^2*log(F))*x^2 + 9*(F^(b*c^3 + a)*b^3*c^8*d*log(F)^3 -
 2*F^(b*c^3 + a)*b^2*c^5*d*log(F)^2 + 2*F^(b*c^3 + a)*b*c^2*d*log(F))*x - 6
*F^(b*c^3 + a))*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*lo
g(F))/(b^4*d*log(F)^4)
```

Fricas [**B**] Leaf count of result is larger than twice the leaf count of optimal. 302 vs. $2(122) = 244$.
time = 0.38, size = 302, normalized size = 2.44

$$\frac{\left((b^3d^9x^9+9\,b^3cd^8x^8+36\,b^3c^2d^7x^7+84\,b^3c^3d^6x^6+126\,b^3c^4d^5x^5+126\,b^3c^5d^4x^4+84\,b^3c^6d^3x^3+36\,b^3c^7d^2x^2+9\,b^3c^8dx+b^3c^9)\log(F)^3-3\,(b^2d^6x^6+6\,b^2cd^5x^5+15\,b^2c^2d^4x^4+20\,b^2c^3d^3x^3+15\,b^2c^4d^2x^2+6\,b^2c^5dx+b^2c^6)\log(F)^2+6\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3)\log(F)-6\right)F^{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}}{3\,b^4d\log(F)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^11,x, algorithm="fricas")
```

```
[Out] 1/3*((b^3*d^9*x^9 + 9*b^3*c*d^8*x^8 + 36*b^3*c^2*d^7*x^7 + 84*b^3*c^3*d^6*x
^6 + 126*b^3*c^4*d^5*x^5 + 126*b^3*c^5*d^4*x^4 + 84*b^3*c^6*d^3*x^3 + 36*b^
3*c^7*d^2*x^2 + 9*b^3*c^8*d*x + b^3*c^9)*log(F)^3 - 3*(b^2*d^6*x^6 + 6*b^2*
c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + 20*b^2*c^3*d^3*x^3 + 15*b^2*c^4*d^2*x^2 +
6*b^2*c^5*d*x + b^2*c^6)*log(F)^2 + 6*(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*
d*x + b*c^3)*log(F) - 6)*F^(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3
 + a)/(b^4*d*log(F)^4)
```

Sympy [**B**] Leaf count of result is larger than twice the leaf count of optimal. 536 vs. $2(109) = 218$.
time = 0.20, size = 536, normalized size = 4.32

$$\begin{cases} \frac{F^{a+b(c+dx)^3}\left(b^3c^9\log(F)^3+9b^3c^8dx\log(F)^3+36b^3c^7d^2x^2\log(F)^3+84b^3c^6d^3x^3\log(F)^3+126b^3c^5d^4x^4\log(F)^3+126b^3c^4d^5x^5\log(F)^3+84b^3c^3d^6x^6\log(F)^3+36b^3c^2d^7x^7\log(F)^3+9b^3cd^8x^8\log(F)^3+b^3d^9x^9\log(F)^3-3b^2c^6\log(F)^2-18b^2c^5dx\log(F)^2-45b^2c^4d^2x^2\log(F)^2-60b^2c^3d^3x^3\log(F)^2-45b^2c^2d^4x^4\log(F)^2-18b^2cd^5x^5\log(F)^2-3b^2d^6x^6\log(F)^2+6bc^3\log(F)+18bc^2dx\log(F)+18bcd^2x^2\log(F)+6bd^3x^3\log(F)-6\right)}{3b^4d\log(F)^4} & \text{for } b^4d\log(F)^4\neq 0 \\ c^{11}x+\frac{11c^{10}dx^2}{2}+\frac{55c^9d^2x^3}{3}+\frac{165c^8d^3x^4}{4}+66c^7d^4x^5+77c^6d^5x^6+66c^5d^6x^7+\frac{165c^4d^7x^8}{4}+\frac{55c^3d^8x^9}{3}+\frac{11c^2d^9x^{10}}{2}+cd^{10}x^{11}+\frac{d^{11}x^{12}}{12} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)*(d*x+c)**11,x)
```

```
[Out] Piecewise(((F**(a + b*(c + d*x)**3)*(b**3*c**9*log(F)**3 + 9*b**3*c**8*d*x*l
og(F)**3 + 36*b**3*c**7*d**2*x**2*log(F)**3 + 84*b**3*c**6*d**3*x**3*log(F)
**3 + 126*b**3*c**5*d**4*x**4*log(F)**3 + 126*b**3*c**4*d**5*x**5*log(F)**3
 + 84*b**3*c**3*d**6*x**6*log(F)**3 + 36*b**3*c**2*d**7*x**7*log(F)**3 + 9*
b**3*c*d**8*x**8*log(F)**3 + b**3*d**9*x**9*log(F)**3 - 3*b**2*c**6*log(F)*
*2 - 18*b**2*c**5*d*x*log(F)**2 - 45*b**2*c**4*d**2*x**2*log(F)**2 - 60*b**
2*c**3*d**3*x**3*log(F)**2 - 45*b**2*c**2*d**4*x**4*log(F)**2 - 18*b**2*c*d
**5*x**5*log(F)**2 - 3*b**2*d**6*x**6*log(F)**2 + 6*b*c**3*log(F) + 18*b*c*
*2*d*x*log(F) + 18*b*c*d**2*x**2*log(F) + 6*b*d**3*x**3*log(F) - 6)/(3*b**4
*d*log(F)**4), Ne(b**4*d*log(F)**4, 0)), (c**11*x + 11*c**10*d*x**2/2 + 55*
c**9*d**2*x**3/3 + 165*c**8*d**3*x**4/4 + 66*c**7*d**4*x**5 + 77*c**6*d**5*
x**6 + 66*c**5*d**6*x**7 + 165*c**4*d**7*x**8/4 + 55*c**3*d**8*x**9/3 + 11*
c**2*d**9*x**10/2 + c*d**10*x**11 + d**11*x**12/12, True))
```

Giac [**B**] Leaf count of result is larger than twice the leaf count of optimal. 1320 vs. $2(122) = 244$.
time = 4.60, size = 1320, normalized size = 10.65

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^11,x, algorithm="giac")
```

```
[Out] 1/3*(b^3*d^9*x^9*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*l
og(F) + b*c^3*log(F) + a*log(F))*log(F)^3 + 9*b^3*c*d^8*x^8*e^(b*d^3*x^3*lo
g(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))
*log(F)^3 + 36*b^3*c^2*d^7*x^7*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) +
 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F)^3 + 84*b^3*c^3*d^6*x^
6*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*l
og(F) + a*log(F))*log(F)^3 + 126*b^3*c^4*d^5*x^5*e^(b*d^3*x^3*log(F) + 3*b*
c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F)^3 +
 126*b^3*c^5*d^4*x^4*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d
*x*log(F) + b*c^3*log(F) + a*log(F))*log(F)^3 + 84*b^3*c^6*d^3*x^3*e^(b*d^3
*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*
log(F))*log(F)^3 + 36*b^3*c^7*d^2*x^2*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*l
og(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F)^3 - 3*b^2*d^6*
```

```
x^6*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3
*log(F) + a*log(F))*log(F)^2 + 9*b^3*c^8*d*x*e^(b*d^3*x^3*log(F) + 3*b*c*d^
2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F)^3 - 18*
b^2*c*d^5*x^5*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(
F) + b*c^3*log(F) + a*log(F))*log(F)^2 + b^3*c^9*e^(b*d^3*x^3*log(F) + 3*b*
c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F)^3 -
 45*b^2*c^2*d^4*x^4*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*
x*log(F) + b*c^3*log(F) + a*log(F))*log(F)^2 - 60*b^2*c^3*d^3*x^3*e^(b*d^3*
x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*l
og(F))*log(F)^2 - 45*b^2*c^4*d^2*x^2*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*lo
g(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F)^2 - 18*b^2*c^5*
d*x*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3
*log(F) + a*log(F))*log(F)^2 - 3*b^2*c^6*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^
2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F)^2 + 6*b*d^3
*x^3*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^
3*log(F) + a*log(F))*log(F) + 18*b*c*d^2*x^2*e^(b*d^3*x^3*log(F) + 3*b*c*d^
2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F) + 18*b*
c^2*d*x*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b
*c^3*log(F) + a*log(F))*log(F) + 6*b*c^3*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^
2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F) - 6*e^(b*d^
3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a
*log(F)))/(b^4*d*log(F)^4)
```

Mupad [B]
time = 3.87, size = 323, normalized size = 2.60

$$F^{b\,d^3\,x^3}\,F^{3\,b\,c^2\,d\,x}\,F^a\,F^{b\,c^3}\,F^{3\,b\,c\,d^2\,x^2}\,\left(\frac{b^3\,c^9\,\ln\left(F\right)^3-3\,b^2\,c^6\,\ln\left(F\right)^2+6\,b\,c^3\,\ln\left(F\right)-6}{3\,b^4\,d\,\ln\left(F\right)^4}+\frac{d^8\,x^9}{3\,b\,\ln\left(F\right)}+\frac{3\,c\,d^7\,x^8}{b\,\ln\left(F\right)}+\frac{2\,d^2\,x^3\,\left(14\,b^2\,c^6\,\ln\left(F\right)^2-10\,b\,c^3\,\ln\left(F\right)+1\right)}{b^3\,\ln\left(F\right)^3}+\frac{d^5\,x^6\,\left(28\,b\,c^3\,\ln\left(F\right)-1\right)}{b^2\,\ln\left(F\right)^2}+\frac{12\,c^2\,d^6\,x^7}{b\,\ln\left(F\right)}+\frac{3\,c^2\,x\,\left(b^2\,c^6\,\ln\left(F\right)^2-2\,b\,c^3\,\ln\left(F\right)+2\right)}{b^3\,\ln\left(F\right)^3}+\frac{3\,c^2\,d^3\,x^4\,\left(14\,b\,c^3\,\ln\left(F\right)-5\right)}{b^2\,\ln\left(F\right)^2}+\frac{3\,c\,d\,x^2\,\left(4\,b^2\,c^6\,\ln\left(F\right)^2-5\,b\,c^3\,\ln\left(F\right)+2\right)}{b^3\,\ln\left(F\right)^3}+\frac{6\,c\,d^4\,x^5\,\left(7\,b\,c^3\,\ln\left(F\right)-1\right)}{b^2\,\ln\left(F\right)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)*(c + d*x)^11,x)
```

```
[Out] F^(b*d^3*x^3)*F^(3*b*c^2*d*x)*F^a*F^(b*c^3)*F^(3*b*c*d^2*x^2)*((6*b*c^3*log
(F) - 3*b^2*c^6*log(F)^2 + b^3*c^9*log(F)^3 - 6)/(3*b^4*d*log(F)^4) + (d^8*
x^9)/(3*b*log(F)) + (3*c*d^7*x^8)/(b*log(F)) + (2*d^2*x^3*(14*b^2*c^6*log(F
)^2 - 10*b*c^3*log(F) + 1))/(b^3*log(F)^3) + (d^5*x^6*(28*b*c^3*log(F) - 1)
)/(b^2*log(F)^2) + (12*c^2*d^6*x^7)/(b*log(F)) + (3*c^2*x*(b^2*c^6*log(F)^2
 - 2*b*c^3*log(F) + 2))/(b^3*log(F)^3) + (3*c^2*d^3*x^4*(14*b*c^3*log(F) -
5))/(b^2*log(F)^2) + (3*c*d*x^2*(4*b^2*c^6*log(F)^2 - 5*b*c^3*log(F) + 2))/
(b^3*log(F)^3) + (6*c*d^4*x^5*(7*b*c^3*log(F) - 1))/(b^2*log(F)^2))
```

3.284 $\int F^{a+b(c+dx)^3}(c+dx)^8\,dx$

Optimal. Leaf size=96

$$\frac{2F^{a+b(c+dx)^3}}{3b^3d\log^3(F)}-\frac{2F^{a+b(c+dx)^3}(c+dx)^3}{3b^2d\log^2(F)}+\frac{F^{a+b(c+dx)^3}(c+dx)^6}{3bd\log(F)}$$

```
[Out] 2/3*F^(a+b*(d*x+c)^3)/b^3/d/ln(F)^3-2/3*F^(a+b*(d*x+c)^3)*(d*x+c)^3/b^2/d/l
n(F)^2+1/3*F^(a+b*(d*x+c)^3)*(d*x+c)^6/b/d/ln(F)
```

Rubi [A]
time = 0.14, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}=0.095$, Rules used = {2243, 2240}

$$\frac{2F^{a+b(c+dx)^3}}{3b^3d\log^3(F)}-\frac{2(c+dx)^3F^{a+b(c+dx)^3}}{3b^2d\log^2(F)}+\frac{(c+dx)^6F^{a+b(c+dx)^3}}{3bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)*(c + d*x)^8,x]
```

```
[Out] (2*F^(a + b*(c + d*x)^3))/(3*b^3*d*Log[F]^3) - (2*F^(a + b*(c + d*x)^3)*(c
+ d*x)^3)/(3*b^2*d*Log[F]^2) + (F^(a + b*(c + d*x)^3)*(c + d*x)^6)/(3*b*d*L
og[F])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int F^{a+b(c+dx)^3}(c+dx)^8\,dx = \frac{F^{a+b(c+dx)^3}(c+dx)^6}{3bd\log(F)} - \frac{2\int F^{a+b(c+dx)^3}(c+dx)^5\,dx}{b\log(F)}$$
$$= -\frac{2F^{a+b(c+dx)^3}(c+dx)^3}{3b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^3}(c+dx)^6}{3bd\log(F)} + \frac{2\int F^{a+b(c+dx)^3}(c+dx)^2\,dx}{b^2\log^2(F)}$$
$$= \frac{2F^{a+b(c+dx)^3}}{3b^3d\log^3(F)} - \frac{2F^{a+b(c+dx)^3}(c+dx)^3}{3b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^3}(c+dx)^6}{3bd\log(F)}$$

Mathematica [A]
time = 0.24, size = 56, normalized size = 0.58

$$\frac{F^{a+b(c+dx)^3}\left(2-2b(c+dx)^3\log(F)+b^2(c+dx)^6\log^2(F)\right)}{3b^3d\log^3(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)*(c + d*x)^8,x]
```

```
[Out] (F^(a + b*(c + d*x)^3)*(2 - 2*b*(c + d*x)^3*Log[F] + b^2*(c + d*x)^6*Log[F]
^2))/(3*b^3*d*Log[F]^3)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 199 vs. 2(90) = 180.
time = 0.09, size = 200, normalized size = 2.08

method	result
gosper	$\frac{\left(d^6x^6\ln(F)^2b^2+6c\,d^5x^5\ln(F)^2b^2+15c^2d^4x^4\ln(F)^2b^2+20\ln(F)^2b^2c^3d^3x^3+15\ln(F)^2b^2c^4d^2x^2+6\ln(F)^2b^2c^5dx+\ln(F)^2b^2c^6-2\ln(\right.}{3\ln(F)^3b^3d}$
risch	$\frac{\left(d^6x^6\ln(F)^2b^2+6c\,d^5x^5\ln(F)^2b^2+15c^2d^4x^4\ln(F)^2b^2+20\ln(F)^2b^2c^3d^3x^3+15\ln(F)^2b^2c^4d^2x^2+6\ln(F)^2b^2c^5dx+\ln(F)^2b^2c^6-2\ln(\right.}{3\ln(F)^3b^3d}$
norman	$\frac{cd(5\ln(F)b\,c^3-2)x^2e^{\left(a+b(dx+c)^3\right)\ln(F)}}{\ln(F)^2b^2}+\frac{\left(\ln(F)^2b^2c^6-2\ln(F)b\,c^3+2\right)e^{\left(a+b(dx+c)^3\right)\ln(F)}}{3\ln(F)^3b^3d}+\frac{d^5x^6e^{\left(a+b(dx+c)^3\right)\ln(F)}}{3\ln(F)b}+\frac{2c^2}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^3)*(d*x+c)^8,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*(d^6*x^6*ln(F)^2*b^2+6*c*d^5*x^5*ln(F)^2*b^2+15*c^2*d^4*x^4*ln(F)^2*b^2
+20*ln(F)^2*b^2*c^3*d^3*x^3+15*ln(F)^2*b^2*c^4*d^2*x^2+6*ln(F)^2*b^2*c^5*d*
x+ln(F)^2*b^2*c^6-2*ln(F)*b*d^3*x^3-6*ln(F)*b*c*d^2*x^2-6*ln(F)*b*c^2*d*x-2
*ln(F)*b*c^3+2)*F^(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)/ln(F)^3/b^3
/d
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 308 vs. $2(90) = 180$.
time = 0.38, size = 308, normalized size = 3.21

$$\frac{\left(F^{bc^3+a}b^2d^6x^6\log\left(F\right)^2+6\,F^{bc^3+a}b^2cd^5x^5\log\left(F\right)^2+15\,F^{bc^3+a}b^2c^2d^4x^4\log\left(F\right)^2+F^{bc^3+a}b^2c^6\log\left(F\right)^2-2\,F^{bc^3+a}bc^3\log\left(F\right)+2\left(10\,F^{bc^3+a}b^2c^3d^3\log\left(F\right)^2-F^{bc^3+a}bd^3\log\left(F\right)\right)x^3+3\left(5\,F^{bc^3+a}b^2c^4d^2\log\left(F\right)^2-2\,F^{bc^3+a}bcd^2\log\left(F\right)\right)x^2+6\left(F^{bc^3+a}b^2c^5d\log\left(F\right)^2-F^{bc^3+a}bc^2d\log\left(F\right)\right)x+2\,F^{bc^3+a}\right)e^{\left(bd^3x^3\log(F)+3\,bcd^2x^2\log(F)+3\,bc^2dx\log(F)\right)}}{3\,b^3d\log\left(F\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^8,x, algorithm="maxima")
```

```
[Out] 1/3*(F^(b*c^3 + a)*b^2*d^6*x^6*log(F)^2 + 6*F^(b*c^3 + a)*b^2*c*d^5*x^5*log
(F)^2 + 15*F^(b*c^3 + a)*b^2*c^2*d^4*x^4*log(F)^2 + F^(b*c^3 + a)*b^2*c^6*l
og(F)^2 - 2*F^(b*c^3 + a)*b*c^3*log(F) + 2*(10*F^(b*c^3 + a)*b^2*c^3*d^3*lo
g(F)^2 - F^(b*c^3 + a)*b*d^3*log(F))*x^3 + 3*(5*F^(b*c^3 + a)*b^2*c^4*d^2*l
og(F)^2 - 2*F^(b*c^3 + a)*b*c*d^2*log(F))*x^2 + 6*(F^(b*c^3 + a)*b^2*c^5*d*
log(F)^2 - F^(b*c^3 + a)*b*c^2*d*log(F))*x + 2*F^(b*c^3 + a))*e^(b*d^3*x^3*
log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F))/(b^3*d*log(F)^3)
```

Fricas [A]
time = 0.37, size = 172, normalized size = 1.79

$$\frac{\left(\left(b^2d^6x^6+6\,b^2cd^5x^5+15\,b^2c^2d^4x^4+20\,b^2c^3d^3x^3+15\,b^2c^4d^2x^2+6\,b^2c^5dx+b^2c^6\right)\log\left(F\right)^2-2\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3\right)\log\left(F\right)+2\right)F^{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}}{3\,b^3d\log\left(F\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^8,x, algorithm="fricas")
```

```
[Out] 1/3*((b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + 20*b^2*c^3*d^3*x
^3 + 15*b^2*c^4*d^2*x^2 + 6*b^2*c^5*d*x + b^2*c^6)*log(F)^2 - 2*(b*d^3*x^3
+ 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F) + 2)*F^(b*d^3*x^3 + 3*b*c*d^2
*x^2 + 3*b*c^2*d*x + b*c^3 + a)/(b^3*d*log(F)^3)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 304 vs. $2(83) = 166$.
time = 0.14, size = 304, normalized size = 3.17

$$\begin{cases} \frac{F^{a+b(c+dx)^3}\left(b^2c^6\log\left(F\right)^2+6b^2c^5dx\log\left(F\right)^2+15b^2c^4d^2x^2\log\left(F\right)^2+20b^2c^3d^3x^3\log\left(F\right)^2+15b^2c^2d^4x^4\log\left(F\right)^2+6b^2cd^5x^5\log\left(F\right)^2+b^2d^6x^6\log\left(F\right)^2-2bc^3\log\left(F\right)-6bc^2dx\log\left(F\right)-6bcd^2x^2\log\left(F\right)-2bd^3x^3\log\left(F\right)+2\right)}{3b^3d\log\left(F\right)^3} & \text{for}\: b^3d\log\left(F\right)^3\neq 0 \\ c^8x+4c^7dx^2+\frac{28c^6d^2x^3}{3}+14c^5d^3x^4+14c^4d^4x^5+\frac{28c^3d^5x^6}{3}+4c^2d^6x^7+cd^7x^8+\frac{d^8x^9}{9} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)*(d*x+c)**8,x)
```

```
[Out] Piecewise((F**(a + b*(c + d*x)**3)*(b**2*c**6*log(F)**2 + 6*b**2*c**5*d*x*l
og(F)**2 + 15*b**2*c**4*d**2*x**2*log(F)**2 + 20*b**2*c**3*d**3*x**3*log(F)
**2 + 15*b**2*c**2*d**4*x**4*log(F)**2 + 6*b**2*c*d**5*x**5*log(F)**2 + b**
2*d**6*x**6*log(F)**2 - 2*b*c**3*log(F) - 6*b*c**2*d*x*log(F) - 6*b*c*d**2*
x**2*log(F) - 2*b*d**3*x**3*log(F) + 2)/(3*b**3*d*log(F)**3), Ne(b**3*d*log
```

```
(F)**3, 0)), (c**8*x + 4*c**7*d*x**2 + 28*c**6*d**2*x**3/3 + 14*c**5*d**3*x
**4 + 14*c**4*d**4*x**5 + 28*c**3*d**5*x**6/3 + 4*c**2*d**6*x**7 + c*d**7*x
**8 + d**8*x**9/9, True))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 705 vs. 2(90) = 180.
time = 1.79, size = 705, normalized size = 7.34

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^8,x, algorithm="giac")
```

```
[Out] 1/3*(b^2*d^6*x^6*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*l
og(F) + b*c^3*log(F) + a*log(F))*log(F)^2 + 6*b^2*c*d^5*x^5*e^(b*d^3*x^3*lo
g(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))
*log(F)^2 + 15*b^2*c^2*d^4*x^4*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) +
 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F)^2 + 20*b^2*c^3*d^3*x^
3*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*l
og(F) + a*log(F))*log(F)^2 + 15*b^2*c^4*d^2*x^2*e^(b*d^3*x^3*log(F) + 3*b*c
*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F)^2 +
6*b^2*c^5*d*x*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(
F) + b*c^3*log(F) + a*log(F))*log(F)^2 + b^2*c^6*e^(b*d^3*x^3*log(F) + 3*b*
c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F)^2 -
 2*b*d^3*x^3*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F
) + b*c^3*log(F) + a*log(F))*log(F) - 6*b*c*d^2*x^2*e^(b*d^3*x^3*log(F) + 3
*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F)
- 6*b*c^2*d*x*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(
F) + b*c^3*log(F) + a*log(F))*log(F) - 2*b*c^3*e^(b*d^3*x^3*log(F) + 3*b*c*
d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F) + 2*e
^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(
F) + a*log(F)))/(b^3*d*log(F)^3)
```

Mupad [B]
time = 3.66, size = 196, normalized size = 2.04

$$F^{b\,d^3\,x^3}\,F^{3\,b\,c^2\,d\,x}\,F^a\,F^{b\,c^3}\,F^{3\,b\,c\,d^2\,x^2}\,\left(\frac{b^2\,c^6\,\ln\left(F\right)^2-2\,b\,c^3\,\ln\left(F\right)+2}{3\,b^3\,d\,\ln\left(F\right)^3}+\frac{d^5\,x^6}{3\,b\,\ln\left(F\right)}+\frac{2\,c^2\,x\,\left(b\,c^3\,\ln\left(F\right)-1\right)}{b^2\,\ln\left(F\right)^2}+\frac{2\,c\,d^4\,x^5}{b\,\ln\left(F\right)}+\frac{2\,d^2\,x^3\,\left(10\,b\,c^3\,\ln\left(F\right)-1\right)}{3\,b^2\,\ln\left(F\right)^2}+\frac{5\,c^2\,d^3\,x^4}{b\,\ln\left(F\right)}+\frac{c\,d\,x^2\,\left(5\,b\,c^3\,\ln\left(F\right)-2\right)}{b^2\,\ln\left(F\right)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)*(c + d*x)^8,x)
```

```
[Out] F^(b*d^3*x^3)*F^(3*b*c^2*d*x)*F^a*F^(b*c^3)*F^(3*b*c*d^2*x^2)*((b^2*c^6*log
(F)^2 - 2*b*c^3*log(F) + 2)/(3*b^3*d*log(F)^3) + (d^5*x^6)/(3*b*log(F)) + (
2*c^2*x*(b*c^3*log(F) - 1))/(b^2*log(F)^2) + (2*c*d^4*x^5)/(b*log(F)) + (2*
d^2*x^3*(10*b*c^3*log(F) - 1))/(3*b^2*log(F)^2) + (5*c^2*d^3*x^4)/(b*log(F)
) + (c*d*x^2*(5*b*c^3*log(F) - 2))/(b^2*log(F)^2))
```

3.285 $\int F^{a+b(c+dx)^3}(c+dx)^5\,dx$

Optimal. Leaf size=62

$$-\frac{F^{a+b(c+dx)^3}}{3b^2d\log^2(F)}+\frac{F^{a+b(c+dx)^3}(c+dx)^3}{3bd\log(F)}$$

```
[Out] -1/3*F^(a+b*(d*x+c)^3)/b^2/d/ln(F)^2+1/3*F^(a+b*(d*x+c)^3)*(d*x+c)^3/b/d/ln
(F)
```

Rubi [A]
time = 0.09, antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}=0.095$, Rules used = {2243, 2240}

$$\frac{(c+dx)^3F^{a+b(c+dx)^3}}{3bd\log(F)}-\frac{F^{a+b(c+dx)^3}}{3b^2d\log^2(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)*(c + d*x)^5,x]
```

```
[Out] -1/3*F^(a + b*(c + d*x)^3)/(b^2*d*Log[F]^2) + (F^(a + b*(c + d*x)^3)*(c + d
*x)^3)/(3*b*d*Log[F])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\begin{aligned}\int F^{a+b(c+dx)^3}(c+dx)^5\,dx&=\frac{F^{a+b(c+dx)^3}(c+dx)^3}{3bd\log(F)}-\frac{\int F^{a+b(c+dx)^3}(c+dx)^2\,dx}{b\log(F)}\\&=-\frac{F^{a+b(c+dx)^3}}{3b^2d\log^2(F)}+\frac{F^{a+b(c+dx)^3}(c+dx)^3}{3bd\log(F)}\end{aligned}$$

Mathematica [A]
time = 0.18, size = 40, normalized size = 0.65

$$\frac{F^{a+b(c+dx)^3}(-1+b(c+dx)^3\log(F))}{3b^2d\log^2(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)*(c + d*x)^5,x]
```

```
[Out] (F^(a + b*(c + d*x)^3)*(-1 + b*(c + d*x)^3*Log[F]))/(3*b^2*d*Log[F]^2)
```

Maple [A]
time = 0.10, size = 89, normalized size = 1.44

method	result	size
gosper	$\frac{(\ln(F)b\,d^3x^3+3\ln(F)bc\,d^2x^2+3\ln(F)b\,c^2dx+\ln(F)b\,c^3-1)F^{b\,d^3x^3+3bc\,d^2x^2+3b\,c^2dx+b\,c^3+a}}{3\ln(F)^2b^2d}$	89
risch	$\frac{(\ln(F)b\,d^3x^3+3\ln(F)bc\,d^2x^2+3\ln(F)b\,c^2dx+\ln(F)b\,c^3-1)F^{b\,d^3x^3+3bc\,d^2x^2+3b\,c^2dx+b\,c^3+a}}{3\ln(F)^2b^2d}$	89
norman	$\frac{c^2x\,\mathrm{e}^{\left(a+b(dx+c)^3\right)\ln(F)}}{\ln(F)b}+\frac{dc\,x^2\mathrm{e}^{\left(a+b(dx+c)^3\right)\ln(F)}}{\ln(F)b}+\frac{(\ln(F)b\,c^3-1)\mathrm{e}^{\left(a+b(dx+c)^3\right)\ln(F)}}{3\ln(F)^2b^2d}+\frac{d^2x^3\mathrm{e}^{\left(a+b(dx+c)^3\right)\ln(F)}}{3\ln(F)b}$	123

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^3)*(d*x+c)^5,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*(ln(F)*b*d^3*x^3+3*ln(F)*b*c*d^2*x^2+3*ln(F)*b*c^2*d*x+ln(F)*b*c^3-1)*F
^(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)/ln(F)^2/b^2/d
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 133 vs. 2(58) = 116.
time = 0.38, size = 133, normalized size = 2.15

$$\frac{\left(F^{bc^3+a}bd^3x^3\log(F)+3\,F^{bc^3+a}bcd^2x^2\log(F)+3\,F^{bc^3+a}bc^2dx\log(F)+F^{bc^3+a}bc^3\log(F)-F^{bc^3+a}\right)e^{\left(bd^3x^3\log(F)+3\,bcd^2x^2\log(F)+3\,bc^2dx\log(F)\right)}}{3\,b^2d\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^5,x, algorithm="maxima")
```

```
[Out] 1/3*(F^(b*c^3 + a)*b*d^3*x^3*log(F) + 3*F^(b*c^3 + a)*b*c*d^2*x^2*log(F) +
3*F^(b*c^3 + a)*b*c^2*d*x*log(F) + F^(b*c^3 + a)*b*c^3*log(F) - F^(b*c^3 +
a))*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F))/(b^2*d
*log(F)^2)
```

Fricas [A]
time = 0.37, size = 84, normalized size = 1.35

$$\frac{((bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3)\log(F)-1)F^{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}}{3\,b^2d\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^5,x, algorithm="fricas")
```

```
[Out] 1/3*((b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F) - 1)*F^(b*d^3
*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)/(b^2*d*log(F)^2)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 143 vs. $2(49) = 98$.
time = 0.09, size = 143, normalized size = 2.31

$$\begin{cases} \frac{F^{a+b(c+dx)^3}(bc^3\log(F)+3bc^2dx\log(F)+3bcd^2x^2\log(F)+bd^3x^3\log(F)-1)}{3b^2d\log(F)^2} & \text{for } b^2d\log(F)^2 \neq 0 \\ c^5x + \frac{5c^4dx^2}{2} + \frac{10c^3d^2x^3}{3} + \frac{5c^2d^3x^4}{2} + cd^4x^5 + \frac{d^5x^6}{6} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)*(d*x+c)**5,x)
```

```
[Out] Piecewise((F**(a + b*(c + d*x)**3)*(b*c**3*log(F) + 3*b*c**2*d*x*log(F) + 3
*b*c*d**2*x**2*log(F) + b*d**3*x**3*log(F) - 1)/(3*b**2*d*log(F)**2), Ne(b*
*2*d*log(F)**2, 0)), (c**5*x + 5*c**4*d*x**2/2 + 10*c**3*d**2*x**3/3 + 5*c*
*2*d**3*x**4/2 + c*d**4*x**5 + d**5*x**6/6, True))
```

Giac [C] Result contains complex when optimal does not.
time = 2.49, size = 1014, normalized size = 16.35

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^5,x, algorithm="giac")
```

```
[Out] 1/6*(2*(2*(((d*x + c)^3*b*log(abs(F)) - 1)*(pi^2*b^2*sgn(F) - pi^2*b^2 + 2*
b^2*log(abs(F))^2)/((pi^2*b^2*sgn(F) - pi^2*b^2 + 2*b^2*log(abs(F))^2)^2 +
4*(pi*b^2*log(abs(F))*sgn(F) - pi*b^2*log(abs(F)))^2) + (pi*(d*x + c)^3*b*s
gn(F) - pi*(d*x + c)^3*b)*(pi*b^2*log(abs(F))*sgn(F) - pi*b^2*log(abs(F)))/
((pi^2*b^2*sgn(F) - pi^2*b^2 + 2*b^2*log(abs(F))^2)^2 + 4*(pi*b^2*log(abs(F
))*sgn(F) - pi*b^2*log(abs(F)))^2))*cos(-1/2*pi*b*d^3*x^3*sgn(F) + 1/2*pi*b
*d^3*x^3 - 3/2*pi*b*c*d^2*x^2*sgn(F) + 3/2*pi*b*c*d^2*x^2 - 3/2*pi*b*c^2*d*
x*sgn(F) + 3/2*pi*b*c^2*d*x - 1/2*pi*b*c^3*sgn(F) + 1/2*pi*b*c^3 - 1/2*pi*a
*sgn(F) + 1/2*pi*a) + ((pi*(d*x + c)^3*b*sgn(F) - pi*(d*x + c)^3*b)*(pi^2*b
^2*sgn(F) - pi^2*b^2 + 2*b^2*log(abs(F))^2)/((pi^2*b^2*sgn(F) - pi^2*b^2 +
2*b^2*log(abs(F))^2)^2 + 4*(pi*b^2*log(abs(F))*sgn(F) - pi*b^2*log(abs(F)))
^2) - 4*((d*x + c)^3*b*log(abs(F)) - 1)*(pi*b^2*log(abs(F))*sgn(F) - pi*b^2
*log(abs(F)))/((pi^2*b^2*sgn(F) - pi^2*b^2 + 2*b^2*log(abs(F))^2)^2 + 4*(pi
*b^2*log(abs(F))*sgn(F) - pi*b^2*log(abs(F)))^2))*sin(-1/2*pi*b*d^3*x^3*sgn
(F) + 1/2*pi*b*d^3*x^3 - 3/2*pi*b*c*d^2*x^2*sgn(F) + 3/2*pi*b*c*d^2*x^2 - 3
```

```
/2*pi*b*c^2*d*x*sgn(F) + 3/2*pi*b*c^2*d*x - 1/2*pi*b*c^3*sgn(F) + 1/2*pi*b*
c^3 - 1/2*pi*a*sgn(F) + 1/2*pi*a))*e^((d*x + c)^3*b*log(abs(F)) + a*log(abs
(F))) - I*((pi*(d*x + c)^3*b*sgn(F) - pi*(d*x + c)^3*b - 2*I*(d*x + c)^3*b*
log(abs(F)) + 2*I)*e^(1/2*I*pi*b*d^3*x^3*sgn(F) - 1/2*I*pi*b*d^3*x^3 + 3/2*
I*pi*b*c*d^2*x^2*sgn(F) - 3/2*I*pi*b*c*d^2*x^2 + 3/2*I*pi*b*c^2*d*x*sgn(F)
- 3/2*I*pi*b*c^2*d*x + 1/2*I*pi*b*c^3*sgn(F) - 1/2*I*pi*b*c^3 + 1/2*I*pi*a*
sgn(F) - 1/2*I*pi*a)/(pi^2*b^2*sgn(F) + 2*I*pi*b^2*log(abs(F))*sgn(F) - pi^
2*b^2 - 2*I*pi*b^2*log(abs(F)) + 2*b^2*log(abs(F))^2) + (pi*(d*x + c)^3*b*s
gn(F) - pi*(d*x + c)^3*b + 2*I*(d*x + c)^3*b*log(abs(F)) - 2*I)*e^(-1/2*I*p
i*b*d^3*x^3*sgn(F) + 1/2*I*pi*b*d^3*x^3 - 3/2*I*pi*b*c*d^2*x^2*sgn(F) + 3/2
*I*pi*b*c*d^2*x^2 - 3/2*I*pi*b*c^2*d*x*sgn(F) + 3/2*I*pi*b*c^2*d*x - 1/2*I*
pi*b*c^3*sgn(F) + 1/2*I*pi*b*c^3 - 1/2*I*pi*a*sgn(F) + 1/2*I*pi*a)/(pi^2*b^
2*sgn(F) - 2*I*pi*b^2*log(abs(F))*sgn(F) - pi^2*b^2 + 2*I*pi*b^2*log(abs(F)
) + 2*b^2*log(abs(F))^2))*e^((d*x + c)^3*b*log(abs(F)) + a*log(abs(F))))/d
```

Mupad [B]
time = 3.63, size = 95, normalized size = 1.53

$$\frac{F^{b\,d^3\,x^3}\,F^{3\,b\,c^2\,d\,x}\,F^a\,F^{b\,c^3}\,F^{3\,b\,c\,d^2\,x^2}\,\left(b\,\ln\left(F\right)\,c^3+3\,b\,\ln\left(F\right)\,c^2\,d\,x+3\,b\,\ln\left(F\right)\,c\,d^2\,x^2+b\,\ln\left(F\right)\,d^3\,x^3-1\right)}{3\,b^2\,d\ln\left(F\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)*(c + d*x)^5,x)
```

```
[Out] (F^(b*d^3*x^3)*F^(3*b*c^2*d*x)*F^a*F^(b*c^3)*F^(3*b*c*d^2*x^2)*(b*c^3*log(F
) + b*d^3*x^3*log(F) + 3*b*c^2*d*x*log(F) + 3*b*c*d^2*x^2*log(F) - 1))/(3*b
^2*d*log(F)^2)
```

3.286 $\int F^{a+b(c+dx)^3}(c+dx)^2\,dx$

Optimal. Leaf size=27

$$\frac{F^{a+b(c+dx)^3}}{3bd\log(F)}$$

```
[Out] 1/3*F^(a+b*(d*x+c)^3)/b/d/ln(F)
```

Rubi [A]
time = 0.05, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = $\{2240\}$

$$\frac{F^{a+b(c+dx)^3}}{3bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)*(c + d*x)^2,x]
```

```
[Out] F^(a + b*(c + d*x)^3)/(3*b*d*Log[F])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^3}(c+dx)^2\,dx = \frac{F^{a+b(c+dx)^3}}{3bd\log(F)}$$

Mathematica [A]
time = 0.03, size = 27, normalized size = 1.00

$$\frac{F^{a+b(c+dx)^3}}{3bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)*(c + d*x)^2,x]
```

```
[Out] F^(a + b*(c + d*x)^3)/(3*b*d*Log[F])
```

Maple [A]
time = 0.09, size = 26, normalized size = 0.96

method	result	size
derivativedivides	$\frac{F^{a+b(dx+c)^3}}{3bd\ln(F)}$	26
default	$\frac{F^{a+b(dx+c)^3}}{3bd\ln(F)}$	26
norman	$\frac{e^{\left(a+b(dx+c)^3\right)\ln(F)}}{3b\ln(F)d}$	28
gosper	$\frac{F^{b\,d^3x^3+3bc\,d^2x^2+3b\,c^2dx+b\,c^3+a}}{3bd\ln(F)}$	48
risch	$\frac{F^{b\,d^3x^3+3bc\,d^2x^2+3b\,c^2dx+b\,c^3+a}}{3bd\ln(F)}$	48

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^3)*(d*x+c)^2,x,method=_RETURNVERBOSE)
[Out] 1/3*F^(a+b*(d*x+c)^3)/b/d/ln(F)
```

Maxima [A]
time = 0.29, size = 25, normalized size = 0.93

$$\frac{F^{(dx+c)^3b+a}}{3\,bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^2,x, algorithm="maxima")
[Out] 1/3*F^((d*x + c)^3*b + a)/(b*d*log(F))
```

Fricas [A]
time = 0.35, size = 47, normalized size = 1.74

$$\frac{F^{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}}{3\,bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^2,x, algorithm="fricas")
[Out] 1/3*F^(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)/(b*d*log(F))
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 44 vs. $2(19) = 38$.
time = 0.06, size = 44, normalized size = 1.63

$$\begin{cases} \frac{F^{a+b(c+dx)^3}}{3bd\log(F)} & \text{for } bd\log(F)\neq 0 \\ c^2x+cdx^2+\frac{d^2x^3}{3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)*(d*x+c)**2,x)
```

```
[Out] Piecewise((F**(a + b*(c + d*x)**3)/(3*b*d*log(F)), Ne(b*d*log(F), 0)), (c**
2*x + c*d*x**2 + d**2*x**3/3, True))
```

Giac [A]
time = 1.97, size = 47, normalized size = 1.74

$$\frac{F^{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}}{3\,bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^2,x, algorithm="giac")
```

```
[Out] 1/3*F^(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)/(b*d*log(F))
```

Mupad [B]
time = 3.53, size = 25, normalized size = 0.93

$$\frac{F^{a+b\,{\left(c+d\,x\right)}^3}}{3\,b\,d\,\ln\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)*(c + d*x)^2,x)
```

```
[Out] F^(a + b*(c + d*x)^3)/(3*b*d*log(F))
```

3.287 $\int \frac{F^{a+b(c+dx)^3}}{c+dx}\,dx$

Optimal. Leaf size=22

$$\frac{F^a \text{Ei}\left(b(c+dx)^3 \log(F)\right)}{3d}$$

```
[Out] 1/3*F^a*Ei(b*(d*x+c)^3*ln(F))/d
```

Rubi [A]
time = 0.04, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2241}

$$\frac{F^a \text{Ei}\left(b(c+dx)^3 \log(F)\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)/(c + d*x),x]
```

```
[Out] (F^a*ExpIntegralEi[b*(c + d*x)^3*Log[F]])/(3*d)
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^3}}{c+dx}\,dx = \frac{F^a \text{Ei}\left(b(c+dx)^3 \log(F)\right)}{3d}$$

Mathematica [A]
time = 0.19, size = 22, normalized size = 1.00

$$\frac{F^a \text{Ei}\left(b(c+dx)^3 \log(F)\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)/(c + d*x),x]
```

```
[Out] (F^a*ExpIntegralEi[b*(c + d*x)^3*Log[F]])/(3*d)
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(dx+c)^3}}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^3)/(d*x+c),x)
[Out] int(F^(a+b*(d*x+c)^3)/(d*x+c),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c),x, algorithm="maxima")
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c), x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 44 vs. 2(20) = 40.
time = 0.37, size = 44, normalized size = 2.00

$$\frac{F^a\mathrm{Ei}\left(\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3\right)\log\left(F\right)\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c),x, algorithm="fricas")
[Out] 1/3*F^a*Ei((b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F))/d
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^3}}{c+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)/(d*x+c),x)
[Out] Integral(F**(a + b*(c + d*x)**3)/(c + d*x), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c),x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c), x)
```

Mupad [B]
time = 3.58, size = 20, normalized size = 0.91

$$\frac{F^a \operatorname{ei}\left(b \ln(F) (c+dx)^3\right)}{3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)/(c + d*x),x)
```

```
[Out] (F^a*ei(b*log(F)*(c + d*x)^3))/(3*d)
```

3.288 $\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^4} dx$

Optimal. Leaf size=53

$$-\frac{F^{a+b(c+dx)^3}}{3d(c+dx)^3}+\frac{bF^a\text{Ei}\left(b(c+dx)^3\log(F)\right)\log(F)}{3d}$$

```
[Out] -1/3*F^(a+b*(d*x+c)^3)/d/(d*x+c)^3+1/3*b*F^a*Ei(b*(d*x+c)^3*ln(F))*ln(F)/d
```

Rubi [A]
time = 0.09, antiderivative size = 53, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2245, 2241}

$$\frac{bF^a\log(F)\text{Ei}\left(b(c+dx)^3\log(F)\right)}{3d}-\frac{F^{a+b(c+dx)^3}}{3d(c+dx)^3}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)/(c + d*x)^4,x]
```

```
[Out] -1/3*F^(a + b*(c + d*x)^3)/(d*(c + d*x)^3) + (b*F^a*ExpIntegralEi[b*(c + d*
x)^3*Log[F]]*Log[F])/(3*d)
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^4}\,dx &= -\frac{F^{a+b(c+dx)^3}}{3d(c+dx)^3}+(b\log(F))\int \frac{F^{a+b(c+dx)^3}}{c+dx}\,dx\\ &= -\frac{F^{a+b(c+dx)^3}}{3d(c+dx)^3}+\frac{bF^a\text{Ei}\left(b(c+dx)^3\log(F)\right)\log(F)}{3d}\end{aligned}$$

Mathematica [A]
time = 0.19, size = 47, normalized size = 0.89

$$\frac{F^a\left(-\frac{F^{b(c+dx)^3}}{(c+dx)^3}+b\text{Ei}(b(c+dx)^3\log(F))\log(F)\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)/(c + d*x)^4,x]
```

```
[Out] (F^a*(-(F^(b*(c + d*x)^3)/(c + d*x)^3) + b*ExpIntegralEi[b*(c + d*x)^3*Log[
F]]*Log[F]))/(3*d)
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(dx+c)^3}}{(dx+c)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^3)/(d*x+c)^4,x)
```

```
[Out] int(F^(a+b*(d*x+c)^3)/(d*x+c)^4,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^4,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^4, x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 147 vs. $2(49) = 98$.
time = 0.35, size = 147, normalized size = 2.77

$$\frac{(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3)F^a\text{Ei}((bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3)\log(F))\log(F)-F^{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}}{3\,(d^4x^3+3\,cd^3x^2+3\,c^2d^2x+c^3d)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] 1/3*((b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*F^a*Ei((b*d^3*x^3 +
3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F))*log(F) - F^(b*d^3*x^3 + 3*b*c*
```

```
d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a))/(d^4*x^3 + 3*c*d^3*x^2 + 3*c^2*d^2*x +
c^3*d)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)/(d*x+c)**4,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**3)/(c + d*x)**4, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^4,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^4, x)
```

Mupad [B]
time = 3.92, size = 51, normalized size = 0.96

$$-\frac{F^a\left(F^{b\,(c+d\,x)^3}+b\,\ln\left(F\right)\,\mathrm{expint}\left(-b\,\ln\left(F\right)\,\left(c+d\,x\right)^3\right)\,\left(c+d\,x\right)^3\right)}{3\,d\,\left(c+d\,x\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)/(c + d*x)^4,x)
```

```
[Out] -(F^a*(F^(b*(c + d*x)^3) + b*log(F)*expint(-b*log(F)*(c + d*x)^3)*(c + d*x)
^3))/(3*d*(c + d*x)^3)
```

3.289 $\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^7} dx$

Optimal. Leaf size=87

$$-\frac{F^{a+b(c+dx)^3}}{6d(c+dx)^6}-\frac{bF^{a+b(c+dx)^3}\log(F)}{6d(c+dx)^3}+\frac{b^2F^a\text{Ei}(b(c+dx)^3\log(F))\log^2(F)}{6d}$$

```
[Out] -1/6*F^(a+b*(d*x+c)^3)/d/(d*x+c)^6-1/6*b*F^(a+b*(d*x+c)^3)*ln(F)/d/(d*x+c)^
3+1/6*b^2*F^a*Ei(b*(d*x+c)^3*ln(F))*ln(F)^2/d
```

Rubi [A]
time = 0.13, antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2245, 2241}

$$\frac{b^2F^a\log^2(F)\text{Ei}(b(c+dx)^3\log(F))}{6d}-\frac{F^{a+b(c+dx)^3}}{6d(c+dx)^6}-\frac{b\log(F)F^{a+b(c+dx)^3}}{6d(c+dx)^3}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)/(c + d*x)^7,x]
```

```
[Out] -1/6*F^(a + b*(c + d*x)^3)/(d*(c + d*x)^6) - (b*F^(a + b*(c + d*x)^3)*Log[F
])/(6*d*(c + d*x)^3) + (b^2*F^a*ExpIntegralEi[b*(c + d*x)^3*Log[F]]*Log[F]^
2)/(6*d)
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^7}\,dx &= -\frac{F^{a+b(c+dx)^3}}{6d(c+dx)^6}+\frac{1}{2}(b\log(F))\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^4}\,dx\\ &= -\frac{F^{a+b(c+dx)^3}}{6d(c+dx)^6}-\frac{bF^{a+b(c+dx)^3}\log(F)}{6d(c+dx)^3}+\frac{1}{2}\left(b^2\log^2(F)\right)\int \frac{F^{a+b(c+dx)^3}}{c+dx}\,dx\\ &= -\frac{F^{a+b(c+dx)^3}}{6d(c+dx)^6}-\frac{bF^{a+b(c+dx)^3}\log(F)}{6d(c+dx)^3}+\frac{b^2F^a\text{Ei}(b(c+dx)^3\log(F))\log^2(F)}{6d}\end{aligned}$$

Mathematica [A]
time = 0.22, size = 64, normalized size = 0.74

$$\frac{F^a\left(b^2\text{Ei}(b(c+dx)^3\log(F))\log^2(F)-\frac{F^{b(c+dx)^3}(1+b(c+dx)^3\log(F))}{(c+dx)^6}\right)}{6d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)/(c + d*x)^7,x]
```

```
[Out] (F^a*(b^2*ExpIntegralEi[b*(c + d*x)^3*Log[F]]*Log[F]^2 - (F^(b*(c + d*x)^3)
*(1 + b*(c + d*x)^3*Log[F]))/(c + d*x)^6))/(6*d)
```

Maple [F]
time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(dx+c)^3}}{(dx+c)^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^3)/(d*x+c)^7,x)
```

```
[Out] int(F^(a+b*(d*x+c)^3)/(d*x+c)^7,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^7,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^7, x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 269 vs. $2(81) = 162$.
time = 0.35, size = 269, normalized size = 3.09

$$\frac{(b^2d^6x^6 + 6\,b^2cd^5x^5 + 15\,b^2c^2d^4x^4 + 20\,b^2c^3d^3x^3 + 15\,b^2c^4d^2x^2 + 6\,b^2c^5dx + b^2c^6)F^a\mathrm{Ei}((bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3)\log(F))\log(F)^2 - ((bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3)\log(F) + 1)F^{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}}{6\,(d^7x^6 + 6\,cd^6x^5 + 15\,c^2d^5x^4 + 20\,c^3d^4x^3 + 15\,c^4d^3x^2 + 6\,c^5d^2x + c^6d)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^7,x, algorithm="fricas")
```

```
[Out] 1/6*((b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + 20*b^2*c^3*d^3*x
^3 + 15*b^2*c^4*d^2*x^2 + 6*b^2*c^5*d*x + b^2*c^6)*F^a*Ei((b*d^3*x^3 + 3*b*
c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F))*log(F)^2 - ((b*d^3*x^3 + 3*b*c*d^2
*x^2 + 3*b*c^2*d*x + b*c^3)*log(F) + 1)*F^(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*
c^2*d*x + b*c^3 + a))/(d^7*x^6 + 6*c*d^6*x^5 + 15*c^2*d^5*x^4 + 20*c^3*d^4*
x^3 + 15*c^4*d^3*x^2 + 6*c^5*d^2*x + c^6*d)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)/(d*x+c)**7,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^7,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^7, x)
```

Mupad [B]
time = 4.88, size = 76, normalized size = 0.87

$$-\frac{F^a\,b^2\ln(F)^2\left(\frac{\mathrm{expint}\left(-b\,\ln(F)\,{(c+d\,x)}^3\right)}{2}+F^{b\,{(c+d\,x)}^3}\left(\frac{1}{2\,b\,\ln(F)\,{(c+d\,x)}^3}+\frac{1}{2\,b^2\,{\ln(F)}^2\,{(c+d\,x)}^6}\right)\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)/(c + d*x)^7,x)
```

```
[Out] -(F^a*b^2*log(F)^2*(expint(-b*log(F)*(c + d*x)^3)/2 + F^(b*(c + d*x)^3)*(1/
(2*b*log(F)*(c + d*x)^3) + 1/(2*b^2*log(F)^2*(c + d*x)^6))))/(3*d)
```

3.290 $\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^{10}}\,dx$

Optimal. Leaf size=121

$$-\frac{F^{a+b(c+dx)^3}}{9d(c+dx)^9}-\frac{bF^{a+b(c+dx)^3}\log(F)}{18d(c+dx)^6}-\frac{b^2F^{a+b(c+dx)^3}\log^2(F)}{18d(c+dx)^3}+\frac{b^3F^a\text{Ei}(b(c+dx)^3\log(F))\log^3(F)}{18d}$$

```
[Out] -1/9*F^(a+b*(d*x+c)^3)/d/(d*x+c)^9-1/18*b*F^(a+b*(d*x+c)^3)*ln(F)/d/(d*x+c)
^6-1/18*b^2*F^(a+b*(d*x+c)^3)*ln(F)^2/d/(d*x+c)^3+1/18*b^3*F^a*Ei(b*(d*x+c)
^3*ln(F))*ln(F)^3/d
```

Rubi [A]
time = 0.18, antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2245, 2241}

$$\frac{b^3F^a\log^3(F)\text{Ei}(b(c+dx)^3\log(F))}{18d}-\frac{b^2\log^2(F)F^{a+b(c+dx)^3}}{18d(c+dx)^3}-\frac{F^{a+b(c+dx)^3}}{9d(c+dx)^9}-\frac{b\log(F)F^{a+b(c+dx)^3}}{18d(c+dx)^6}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)/(c + d*x)^10,x]
```

```
[Out] -1/9*F^(a + b*(c + d*x)^3)/(d*(c + d*x)^9) - (b*F^(a + b*(c + d*x)^3)*Log[F
])/(18*d*(c + d*x)^6) - (b^2*F^(a + b*(c + d*x)^3)*Log[F]^2)/(18*d*(c + d*x
)^3) + (b^3*F^a*ExpIntegralEi[b*(c + d*x)^3*Log[F]]*Log[F]^3)/(18*d)
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^{10}}\,dx = -\frac{F^{a+b(c+dx)^3}}{9d(c+dx)^9} + \frac{1}{3}(b\log(F))\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^7}\,dx$$
$$= -\frac{F^{a+b(c+dx)^3}}{9d(c+dx)^9} - \frac{bF^{a+b(c+dx)^3}\log(F)}{18d(c+dx)^6} + \frac{1}{6}\left(b^2\log^2(F)\right)\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^4}\,dx$$
$$= -\frac{F^{a+b(c+dx)^3}}{9d(c+dx)^9} - \frac{bF^{a+b(c+dx)^3}\log(F)}{18d(c+dx)^6} - \frac{b^2F^{a+b(c+dx)^3}\log^2(F)}{18d(c+dx)^3} + \frac{1}{6}\left(b^3\log^3(F)\right)\int \frac{F^{a+b(c}}{c+}$$
$$= -\frac{F^{a+b(c+dx)^3}}{9d(c+dx)^9} - \frac{bF^{a+b(c+dx)^3}\log(F)}{18d(c+dx)^6} - \frac{b^2F^{a+b(c+dx)^3}\log^2(F)}{18d(c+dx)^3} + \frac{b^3F^a\text{Ei}(b(c+dx)^3\log(}{18d}$$

Mathematica [A]
time = 0.25, size = 80, normalized size = 0.66

$$\frac{F^a\left(b^3\text{Ei}(b(c+dx)^3\log(F))\log^3(F) + \frac{F^{b(c+dx)^3}\left(-2-b(c+dx)^3\log(F)-b^2(c+dx)^6\log^2(F)\right)}{(c+dx)^9}\right)}{18d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)/(c + d*x)^10,x]
```

```
[Out] (F^a*(b^3*ExpIntegralEi[b*(c + d*x)^3*Log[F]]*Log[F]^3 + (F^(b*(c + d*x)^3)
*(-2 - b*(c + d*x)^3*Log[F] - b^2*(c + d*x)^6*Log[F]^2))/(c + d*x)^9))/(18*
d)
```

Maple [F]
time = 0.05, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(dx+c)^3}}{(dx+c)^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^3)/(d*x+c)^10,x)
```

```
[Out] int(F^(a+b*(d*x+c)^3)/(d*x+c)^10,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^10,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^10, x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 431 vs. $2(113) = 226$.
time = 0.40, size = 431, normalized size = 3.56

$$\frac{\left(b^{3} d^{9} x^{9}+9 \, b^{3} c d^{8} x^{8}+36 \, b^{3} c^{2} d^{7} x^{7}+84 \, b^{3} c^{3} d^{6} x^{6}+126 \, b^{3} c^{4} d^{5} x^{5}+126 \, b^{3} c^{5} d^{4} x^{4}+84 \, b^{3} c^{6} d^{3} x^{3}+36 \, b^{3} c^{7} d^{2} x^{2}+9 \, b^{3} c^{8} d x+b^{3} c^{9}\right) F^{a} \mathrm{Ei}\left(\left(b d^{3} x^{3}+3 \, b c d^{2} x^{2}+3 \, b c^{2} d x+b c^{3}\right) \log \left(F\right)\right) \log \left(F\right)^{3}-\left(\left(b^{2} d^{6} x^{6}+6 \, b^{2} c d^{5} x^{5}+15 \, b^{2} c^{2} d^{4} x^{4}+20 \, b^{2} c^{3} d^{3} x^{3}+15 \, b^{2} c^{4} d^{2} x^{2}+6 \, b^{2} c^{5} d x+b^{2} c^{6}\right) \log \left(F\right)^{2}+\left(b d^{3} x^{3}+3 \, b c d^{2} x^{2}+3 \, b c^{2} d x+b c^{3}\right) \log \left(F\right)+2\right) F^{b d^{3} x^{3}+3 \, b c d^{2} x^{2}+3 \, b c^{2} d x+b c^{3}+a}}{18 \, \left(d^{10} x^{9}+9 \, c d^{9} x^{8}+36 \, c^{2} d^{8} x^{7}+84 \, c^{3} d^{7} x^{6}+126 \, c^{4} d^{6} x^{5}+126 \, c^{5} d^{5} x^{4}+84 \, c^{6} d^{4} x^{3}+36 \, c^{7} d^{3} x^{2}+9 \, c^{8} d^{2} x+c^{9} d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^10,x, algorithm="fricas")
```

```
[Out] 1/18*((b^3*d^9*x^9 + 9*b^3*c*d^8*x^8 + 36*b^3*c^2*d^7*x^7 + 84*b^3*c^3*d^6*
x^6 + 126*b^3*c^4*d^5*x^5 + 126*b^3*c^5*d^4*x^4 + 84*b^3*c^6*d^3*x^3 + 36*b
^3*c^7*d^2*x^2 + 9*b^3*c^8*d*x + b^3*c^9)*F^a*Ei((b*d^3*x^3 + 3*b*c*d^2*x^2
 + 3*b*c^2*d*x + b*c^3)*log(F))*log(F)^3 - ((b^2*d^6*x^6 + 6*b^2*c*d^5*x^5
+ 15*b^2*c^2*d^4*x^4 + 20*b^2*c^3*d^3*x^3 + 15*b^2*c^4*d^2*x^2 + 6*b^2*c^5*
d*x + b^2*c^6)*log(F)^2 + (b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)
*log(F) + 2)*F^(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a))/(d^10
*x^9 + 9*c*d^9*x^8 + 36*c^2*d^8*x^7 + 84*c^3*d^7*x^6 + 126*c^4*d^6*x^5 + 12
6*c^5*d^5*x^4 + 84*c^6*d^4*x^3 + 36*c^7*d^3*x^2 + 9*c^8*d^2*x + c^9*d)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)/(d*x+c)**10,x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 4369 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^10,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^10, x)
```

Mupad [B]
time = 3.87, size = 104, normalized size = 0.86

$$-\frac{F^a\,b^3\,\ln\left(F\right)^3\,\mathrm{expint}\left(-b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^3\right)}{18\,d}-\frac{F^a\,F^{b\,{\left(c+d\,x\right)}^3}\,b^3\,{\ln\left(F\right)}^3\,\left(\frac{1}{6\,b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^3}+\frac{1}{6\,b^2\,{\ln\left(F\right)}^2\,{\left(c+d\,x\right)}^6}+\frac{1}{3\,b^3\,{\ln\left(F\right)}^3\,{\left(c+d\,x\right)}^9}\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)/(c + d*x)^10,x)
```

```
[Out] - (F^a*b^3*log(F)^3*expint(-b*log(F)*(c + d*x)^3))/(18*d) - (F^a*F^(b*(c +
d*x)^3)*b^3*log(F)^3*(1/(6*b*log(F)*(c + d*x)^3) + 1/(6*b^2*log(F)^2*(c + d
*x)^6) + 1/(3*b^3*log(F)^3*(c + d*x)^9)))/(3*d)
```

3.291 $\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^{13}}\,dx$

Optimal. Leaf size=31

$$-\frac{b^4F^a\Gamma(-4,-b(c+dx)^3\log(F))\log^4(F)}{3d}$$

[Out] -1/3*F^a/(d*x+c)^12*Ei(5,-b*(d*x+c)^3*ln(F))/d

Rubi [A]
time = 0.04, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$-\frac{b^4F^a\log^4(F)\text{Gamma}(-4,-b\log(F)(c+dx)^3)}{3d}$$

Antiderivative was successfully verified.

[In] Int[F^(a + b*(c + d*x)^3)/(c + d*x)^13,x]

[Out] -1/3*(b^4*F^a*Gamma[-4, -(b*(c + d*x)^3*Log[F])]*Log[F]^4)/d

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^{13}}\,dx = -\frac{b^4F^a\Gamma(-4,-b(c+dx)^3\log(F))\log^4(F)}{3d}$$

Mathematica [A]
time = 0.21, size = 31, normalized size = 1.00

$$-\frac{b^4F^a\Gamma(-4,-b(c+dx)^3\log(F))\log^4(F)}{3d}$$

Antiderivative was successfully verified.

[In] Integrate[F^(a + b*(c + d*x)^3)/(c + d*x)^13,x]

```
[Out] -1/3*(b^4*F^a*Gamma[-4, -(b*(c + d*x)^3*Log[F])]*Log[F]^4)/d
```

Maple [F]
time = 0.08, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(dx+c)^3}}{(dx+c)^{13}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^3)/(d*x+c)^13,x)
```

```
[Out] int(F^(a+b*(d*x+c)^3)/(d*x+c)^13,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^13,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^13, x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 636 vs. $2(29) = 58$.
time = 0.11, size = 636, normalized size = 20.52

$$\frac{(b^4d^{12}x^{12} + 12\,b^4cd^{11}x^{11} + 66\,b^4c^2d^{10}x^{10} + 220\,b^4c^3d^9x^9 + 495\,b^4c^4d^8x^8 + 792\,b^4c^5d^7x^7 + 924\,b^4c^6d^6x^6 + 792\,b^4c^7d^5x^5 + 495\,b^4c^8d^4x^4 + 220\,b^4c^9d^3x^3 + 66\,b^4c^{10}d^2x^2 + 12\,b^4c^{11}dx + b^4c^{12})F^a\mathrm{Ei}((bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3)\log(F))\log(F)^4 - ((b^3d^9x^9 + 9\,b^3cd^8x^8 + 36\,b^3c^2d^7x^7 + 84\,b^3c^3d^6x^6 + 126\,b^3c^4d^5x^5 + 126\,b^3c^5d^4x^4 + 84\,b^3c^6d^3x^3 + 36\,b^3c^7d^2x^2 + 9\,b^3c^8dx + b^3c^9)\log(F)^3 + (b^2d^6x^6 + 6\,b^2cd^5x^5 + 15\,b^2c^2d^4x^4 + 20\,b^2c^3d^3x^3 + 15\,b^2c^4d^2x^2 + 6\,b^2c^5dx + b^2c^6)\log(F)^2 + 2\,(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3)\log(F) + 6)F^{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}}{72\,(d^{13}x^{12} + 12\,cd^{12}x^{11} + 66\,c^2d^{11}x^{10} + 220\,c^3d^{10}x^9 + 495\,c^4d^9x^8 + 792\,c^5d^8x^7 + 924\,c^6d^7x^6 + 792\,c^7d^6x^5 + 495\,c^8d^5x^4 + 220\,c^9d^4x^3 + 66\,c^{10}d^3x^2 + 12\,c^{11}d^2x + c^{12}d)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^13,x, algorithm="fricas")
```

```
[Out] 1/72*((b^4*d^12*x^12 + 12*b^4*c*d^11*x^11 + 66*b^4*c^2*d^10*x^10 + 220*b^4*
c^3*d^9*x^9 + 495*b^4*c^4*d^8*x^8 + 792*b^4*c^5*d^7*x^7 + 924*b^4*c^6*d^6*x
^6 + 792*b^4*c^7*d^5*x^5 + 495*b^4*c^8*d^4*x^4 + 220*b^4*c^9*d^3*x^3 + 66*b
^4*c^10*d^2*x^2 + 12*b^4*c^11*d*x + b^4*c^12)*F^a*Ei((b*d^3*x^3 + 3*b*c*d^2
*x^2 + 3*b*c^2*d*x + b*c^3)*log(F))*log(F)^4 - ((b^3*d^9*x^9 + 9*b^3*c*d^8*
x^8 + 36*b^3*c^2*d^7*x^7 + 84*b^3*c^3*d^6*x^6 + 126*b^3*c^4*d^5*x^5 + 126*b
^3*c^5*d^4*x^4 + 84*b^3*c^6*d^3*x^3 + 36*b^3*c^7*d^2*x^2 + 9*b^3*c^8*d*x +
b^3*c^9)*log(F)^3 + (b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + 2
0*b^2*c^3*d^3*x^3 + 15*b^2*c^4*d^2*x^2 + 6*b^2*c^5*d*x + b^2*c^6)*log(F)^2
+ 2*(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F) + 6)*F^(b*d^3*
x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a))/(d^13*x^12 + 12*c*d^12*x^11
 + 66*c^2*d^11*x^10 + 220*c^3*d^10*x^9 + 495*c^4*d^9*x^8 + 792*c^5*d^8*x^7
+ 924*c^6*d^7*x^6 + 792*c^7*d^6*x^5 + 495*c^8*d^5*x^4 + 220*c^9*d^4*x^3 + 6
6*c^10*d^3*x^2 + 12*c^11*d^2*x + c^12*d)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)/(d*x+c)**13,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^13,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^13, x)
```

Mupad [B]
time = 4.03, size = 120, normalized size = 3.87

$$-\frac{F^a\,b^4\ln\left(F\right)^4\,\mathrm{expint}\left(-b\ln\left(F\right)\,\left(c+d\,x\right)^3\right)}{72\,d}-\frac{F^a\,F^{b\,\left(c+d\,x\right)^3}\,b^4\ln\left(F\right)^4\left(\frac{1}{24\,b\ln(F)\,\left(c+d\,x\right)^3}+\frac{1}{24\,b^2\ln(F)^2\,\left(c+d\,x\right)^6}+\frac{1}{12\,b^3\ln(F)^3\,\left(c+d\,x\right)^9}+\frac{1}{4\,b^4\ln(F)^4\,\left(c+d\,x\right)^{12}}\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)/(c + d*x)^13,x)
```

```
[Out] - (F^a*b^4*log(F)^4*expint(-b*log(F)*(c + d*x)^3))/(72*d) - (F^a*F^(b*(c +
d*x)^3)*b^4*log(F)^4*(1/(24*b*log(F)*(c + d*x)^3) + 1/(24*b^2*log(F)^2*(c +
 d*x)^6) + 1/(12*b^3*log(F)^3*(c + d*x)^9) + 1/(4*b^4*log(F)^4*(c + d*x)^12
)))/(3*d)
```

3.292 $\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^{16}}\,dx$

Optimal. Leaf size=31

$$\frac{b^5F^a\Gamma(-5,-b(c+dx)^3\log(F))\log^5(F)}{3d}$$

```
[Out] -1/3*F^a/(d*x+c)^15*Ei(6,-b*(d*x+c)^3*ln(F))/d
```

Rubi [A]
time = 0.04, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$\frac{b^5F^a\log^5(F)\text{Gamma}(-5,-b\log(F)(c+dx)^3)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)/(c + d*x)^16,x]
```

```
[Out] (b^5*F^a*Gamma[-5, -(b*(c + d*x)^3*Log[F])]*Log[F]^5)/(3*d)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^{16}}\,dx = \frac{b^5F^a\Gamma(-5,-b(c+dx)^3\log(F))\log^5(F)}{3d}$$

Mathematica [A]
time = 0.23, size = 31, normalized size = 1.00

$$\frac{b^5F^a\Gamma(-5,-b(c+dx)^3\log(F))\log^5(F)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)/(c + d*x)^16,x]
```

```
[Out] (b^5*F^a*Gamma[-5, -(b*(c + d*x)^3*Log[F])]*Log[F]^5)/(3*d)
```

Maple [F]
time = 0.11, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(dx+c)^3}}{(dx+c)^{16}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^3)/(d*x+c)^16,x)
[Out] int(F^(a+b*(d*x+c)^3)/(d*x+c)^16,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^16,x, algorithm="maxima")
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^16, x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 883 vs. $2(29) = 58$.
time = 0.09, size = 883, normalized size = 28.48

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^16,x, algorithm="fricas")
[Out] 1/360*((b^5*d^15*x^15 + 15*b^5*c*d^14*x^14 + 105*b^5*c^2*d^13*x^13 + 455*b^
5*c^3*d^12*x^12 + 1365*b^5*c^4*d^11*x^11 + 3003*b^5*c^5*d^10*x^10 + 5005*b^
5*c^6*d^9*x^9 + 6435*b^5*c^7*d^8*x^8 + 6435*b^5*c^8*d^7*x^7 + 5005*b^5*c^9*
d^6*x^6 + 3003*b^5*c^10*d^5*x^5 + 1365*b^5*c^11*d^4*x^4 + 455*b^5*c^12*d^3*
x^3 + 105*b^5*c^13*d^2*x^2 + 15*b^5*c^14*d*x + b^5*c^15)*F^a*Ei((b*d^3*x^3
+ 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F))*log(F)^5 - ((b^4*d^12*x^12 +
 12*b^4*c*d^11*x^11 + 66*b^4*c^2*d^10*x^10 + 220*b^4*c^3*d^9*x^9 + 495*b^4*
c^4*d^8*x^8 + 792*b^4*c^5*d^7*x^7 + 924*b^4*c^6*d^6*x^6 + 792*b^4*c^7*d^5*x
^5 + 495*b^4*c^8*d^4*x^4 + 220*b^4*c^9*d^3*x^3 + 66*b^4*c^10*d^2*x^2 + 12*b
^4*c^11*d*x + b^4*c^12)*log(F)^4 + (b^3*d^9*x^9 + 9*b^3*c*d^8*x^8 + 36*b^3*
c^2*d^7*x^7 + 84*b^3*c^3*d^6*x^6 + 126*b^3*c^4*d^5*x^5 + 126*b^3*c^5*d^4*x^
4 + 84*b^3*c^6*d^3*x^3 + 36*b^3*c^7*d^2*x^2 + 9*b^3*c^8*d*x + b^3*c^9)*log(
F)^3 + 2*(b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + 20*b^2*c^3*d
^3*x^3 + 15*b^2*c^4*d^2*x^2 + 6*b^2*c^5*d*x + b^2*c^6)*log(F)^2 + 6*(b*d^3*
```

```
x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F) + 24)*F^(b*d^3*x^3 + 3*b*
c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a))/(d^16*x^15 + 15*c*d^15*x^14 + 105*c^2
*d^14*x^13 + 455*c^3*d^13*x^12 + 1365*c^4*d^12*x^11 + 3003*c^5*d^11*x^10 +
5005*c^6*d^10*x^9 + 6435*c^7*d^9*x^8 + 6435*c^8*d^8*x^7 + 5005*c^9*d^7*x^6
+ 3003*c^10*d^6*x^5 + 1365*c^11*d^5*x^4 + 455*c^12*d^4*x^3 + 105*c^13*d^3*x
^2 + 15*c^14*d^2*x + c^15*d)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)/(d*x+c)**16,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^16,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^16, x)
```

Mupad [**B**]
time = 4.30, size = 136, normalized size = 4.39

$$-\frac{F^a\,b^5\,\ln\left(F\right)^5\,\mathrm{expint}\left(-b\,\ln\left(F\right)\,\left(c+d\,x\right)^3\right)}{360\,d}-\frac{F^a\,F^{b\,\left(c+d\,x\right)^3}\,b^5\,\ln\left(F\right)^5\,\left(\frac{1}{120\,b\,\ln(F)\,\left(c+d\,x\right)^3}+\frac{1}{120\,b^2\,\ln(F)^2\,\left(c+d\,x\right)^6}+\frac{1}{60\,b^3\,\ln(F)^3\,\left(c+d\,x\right)^9}+\frac{1}{20\,b^4\,\ln(F)^4\,\left(c+d\,x\right)^{12}}+\frac{1}{5\,b^5\,\ln(F)^5\,\left(c+d\,x\right)^{15}}\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)/(c + d*x)^16,x)
```

```
[Out] - (F^a*b^5*log(F)^5*expint(-b*log(F)*(c + d*x)^3))/(360*d) - (F^a*F^(b*(c +
 d*x)^3)*b^5*log(F)^5*(1/(120*b*log(F)*(c + d*x)^3) + 1/(120*b^2*log(F)^2*(
c + d*x)^6) + 1/(60*b^3*log(F)^3*(c + d*x)^9) + 1/(20*b^4*log(F)^4*(c + d*x
)^12) + 1/(5*b^5*log(F)^5*(c + d*x)^15)))/(3*d)
```

3.293 $\int F^{a+b(c+dx)^3}(c+dx)^3\,dx$

Optimal. Leaf size=49

$$-\frac{F^a(c+dx)^4\Gamma\left(\frac{4}{3},-b(c+dx)^3\log(F)\right)}{3d\left(-b(c+dx)^3\log(F)\right)^{4/3}}$$

```
[Out] -1/3*F^a*(d*x+c)^4*GAMMA(4/3,-b*(d*x+c)^3*ln(F))/d/(-b*(d*x+c)^3*ln(F))^(4/
3)
```

Rubi [A]
time = 0.05, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = $\{2250\}$

$$-\frac{F^a(c+dx)^4\text{Gamma}\left(\frac{4}{3},-b\log(F)(c+dx)^3\right)}{3d\left(-b\log(F)(c+dx)^3\right)^{4/3}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)*(c + d*x)^3,x]
```

```
[Out] -1/3*(F^a*(c + d*x)^4*Gamma[4/3, -(b*(c + d*x)^3*Log[F])])/(d*(-(b*(c + d*x
)^3*Log[F]))^(4/3))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^3}(c+dx)^3\,dx=-\frac{F^a(c+dx)^4\Gamma\left(\frac{4}{3},-b(c+dx)^3\log(F)\right)}{3d\left(-b(c+dx)^3\log(F)\right)^{4/3}}$$

Mathematica [A]
time = 0.22, size = 49, normalized size = 1.00

$$-\frac{F^a(c+dx)^4\Gamma\left(\frac{4}{3},-b(c+dx)^3\log(F)\right)}{3d\left(-b(c+dx)^3\log(F)\right)^{4/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)*(c + d*x)^3,x]
```

```
[Out] -1/3*(F^a*(c + d*x)^4*Gamma[4/3, -(b*(c + d*x)^3*Log[F])])/(d*(-(b*(c + d*x
)^3*Log[F]))^(4/3))
```

Maple [**F**]
time = 0.02, size = 0, normalized size = 0.00

$$\int F^{a+b(dx+c)^3}(dx+c)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^3)*(d*x+c)^3,x)
```

```
[Out] int(F^(a+b*(d*x+c)^3)*(d*x+c)^3,x)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^3*F^((d*x + c)^3*b + a), x)
```

Fricas [**B**] Leaf count of result is larger than twice the leaf count of optimal. 118 vs. $2(43) = 86$.
time = 0.09, size = 118, normalized size = 2.41

$$\frac{3\left(bd^3x+bcd^2\right)F^{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\log\left(F\right)-\left(-bd^3\log\left(F\right)\right)^{\frac{2}{3}}F^a\Gamma\left(\frac{1}{3},-\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3\right)\log\left(F\right)\right)}{9\,b^2d^3\log\left(F\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] 1/9*(3*(b*d^3*x + b*c*d^2)*F^(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c
^3 + a)*log(F) - (-b*d^3*log(F))^(2/3)*F^a*gamma(1/3, -(b*d^3*x^3 + 3*b*c*d
^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F)))/(b^2*d^3*log(F)^2)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^3}(c+dx)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)*(d*x+c)**3,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**3)*(c + d*x)**3, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^3,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^3*F^((d*x + c)^3*b + a), x)
```

Mupad [B]
time = 3.92, size = 112, normalized size = 2.29

$$\frac{F^a\,F^{b\,(c+d\,x)^3}\,(c+d\,x)}{3\,b\,d\,\ln(F)}-\frac{F^a\,\Gamma\left(\frac{1}{3},-b\,\ln(F)\,(c+d\,x)^3\right)\,(c+d\,x)^4}{9\,d\,\left(-b\,\ln(F)\,(c+d\,x)^3\right)^{4/3}}+\frac{2\,\pi\,\sqrt{3}\,F^a\,(c+d\,x)^4}{27\,d\,\Gamma\left(\frac{2}{3}\right)\,\left(-b\,\ln(F)\,(c+d\,x)^3\right)^{4/3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)*(c + d*x)^3,x)
```

```
[Out] (F^a*F^(b*(c + d*x)^3)*(c + d*x))/(3*b*d*log(F)) - (F^a*igamma(1/3, -b*log(
F)*(c + d*x)^3)*(c + d*x)^4)/(9*d*(-b*log(F)*(c + d*x)^3)^(4/3)) + (2*3^(1/
2)*F^a*pi*(c + d*x)^4)/(27*d*gamma(2/3)*(-b*log(F)*(c + d*x)^3)^(4/3))
```

3.294 $\int F^{a+b(c+dx)^3}(c+dx)\,dx$

Optimal. Leaf size=49

$$-\frac{F^a(c+dx)^2\Gamma\left(\frac{2}{3},-b(c+dx)^3\log(F)\right)}{3d\left(-b(c+dx)^3\log(F)\right)^{2/3}}$$

```
[Out] -1/3*F^a*(d*x+c)^2*GAMMA(2/3,-b*(d*x+c)^3*ln(F))/d/(-b*(d*x+c)^3*ln(F))^(2/
3)
```

Rubi [A]
time = 0.03, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.053, Rules used = {2250}

$$-\frac{F^a(c+dx)^2\text{Gamma}\left(\frac{2}{3},-b\log(F)(c+dx)^3\right)}{3d\left(-b\log(F)(c+dx)^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)*(c + d*x),x]
```

```
[Out] -1/3*(F^a*(c + d*x)^2*Gamma[2/3, -(b*(c + d*x)^3*Log[F])])/(d*(-(b*(c + d*x
)^3*Log[F]))^(2/3))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^3}(c+dx)\,dx=-\frac{F^a(c+dx)^2\Gamma\left(\frac{2}{3},-b(c+dx)^3\log(F)\right)}{3d\left(-b(c+dx)^3\log(F)\right)^{2/3}}$$

Mathematica [A]
time = 0.16, size = 49, normalized size = 1.00

$$-\frac{F^a(c+dx)^2\Gamma\left(\frac{2}{3},-b(c+dx)^3\log(F)\right)}{3d\left(-b(c+dx)^3\log(F)\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)*(c + d*x),x]
```

```
[Out] -1/3*(F^a*(c + d*x)^2*Gamma[2/3, -(b*(c + d*x)^3*Log[F])])/(d*(-(b*(c + d*x
)^3*Log[F]))^(2/3))
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int F^{a+b(dx+c)^{3}}(dx+c)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^3)*(d*x+c),x)
```

```
[Out] int(F^(a+b*(d*x+c)^3)*(d*x+c),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c),x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)*F^((d*x + c)^3*b + a), x)
```

Fricas [A]
time = 0.10, size = 63, normalized size = 1.29

$$\frac{\left(-bd^{3}\log\left(F\right)\right)^{\frac{1}{3}}F^{a}\Gamma\left(\frac{2}{3},-\left(bd^{3}x^{3}+3\,bcd^{2}x^{2}+3\,bc^{2}dx+bc^{3}\right)\log\left(F\right)\right)}{3\,bd^{2}\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c),x, algorithm="fricas")
```

```
[Out] 1/3*(-b*d^3*log(F))^(1/3)*F^a*gamma(2/3, -(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*
c^2*d*x + b*c^3)*log(F))/(b*d^2*log(F))
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^{3}}(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)*(d*x+c),x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**3)*(c + d*x), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c),x, algorithm="giac")
[Out] integrate((d*x + c)*F^((d*x + c)^3*b + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int F^{a+b\,(c+d\,x)^3}\,(c+d\,x)\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)*(c + d*x),x)
[Out] int(F^(a + b*(c + d*x)^3)*(c + d*x), x)
```

3.295 $\int F^{a+b(c+dx)^3}\,dx$

Optimal. Leaf size=47

$$-\frac{F^a(c+dx)\Gamma\left(\frac{1}{3},-b(c+dx)^3\log(F)\right)}{3d\sqrt[3]{-b(c+dx)^3\log(F)}}$$

```
[Out] -1/3*F^a*(d*x+c)*GAMMA(1/3,-b*(d*x+c)^3*ln(F))/d/(-b*(d*x+c)^3*ln(F))^(1/3)
```

Rubi [A]
time = 0.01, antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2239}

$$-\frac{F^a(c+dx)\mathrm{Gamma}\left(\frac{1}{3},-b\log(F)(c+dx)^3\right)}{3d\sqrt[3]{-b\log(F)(c+dx)^3}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3),x]
```

```
[Out] -1/3*(F^a*(c + d*x)*Gamma[1/3, -(b*(c + d*x)^3*Log[F])])/(d*(-(b*(c + d*x)^
3*Log[F]))^(1/3))
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rubi steps

$$\int F^{a+b(c+dx)^3}\,dx = -\frac{F^a(c+dx)\Gamma\left(\frac{1}{3},-b(c+dx)^3\log(F)\right)}{3d\sqrt[3]{-b(c+dx)^3\log(F)}}$$

Mathematica [A]
time = 0.09, size = 47, normalized size = 1.00

$$-\frac{F^a(c+dx)\Gamma\left(\frac{1}{3},-b(c+dx)^3\log(F)\right)}{3d\sqrt[3]{-b(c+dx)^3\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3),x]
```

```
[Out] -1/3*(F^a*(c + d*x)*Gamma[1/3, -(b*(c + d*x)^3*Log[F])])/(d*(-(b*(c + d*x)^
3*Log[F]))^(1/3))
```

Maple [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(dx+c)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^3),x)
[Out] int(F^(a+b*(d*x+c)^3),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3),x, algorithm="maxima")
[Out] integrate(F^((d*x + c)^3*b + a), x)
```

Fricas [A]
time = 0.11, size = 63, normalized size = 1.34

$$\frac{\left(-bd^3\log\left(F\right)\right)^{\frac{2}{3}}F^a\Gamma\left(\frac{1}{3}, -\left(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3\right)\log\left(F\right)\right)}{3\,bd^3\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3),x, algorithm="fricas")
[Out] 1/3*(-b*d^3*log(F))^(2/3)*F^a*gamma(1/3, -(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*
c^2*d*x + b*c^3)*log(F))/(b*d^3*log(F))
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3),x)
[Out] Integral(F**(a + b*(c + d*x)**3), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3),x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^3*b + a), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.02

$$\int F^{a+b\,(c+d\,x)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3),x)
```

```
[Out] int(F^(a + b*(c + d*x)^3), x)
```

3.296 $\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^2} \, dx$

Optimal. Leaf size=49

$$-\frac{F^a\Gamma\left(-\frac{1}{3},-b(c+dx)^3\log(F)\right)\sqrt[3]{-b(c+dx)^3\log(F)}}{3d(c+dx)}$$

```
[Out] -1/3*F^a*GAMMA(-1/3,-b*(d*x+c)^3*ln(F))*(-b*(d*x+c)^3*ln(F))^(1/3)/d/(d*x+c
)
```

Rubi [A]
time = 0.04, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$-\frac{F^a\sqrt[3]{-b\log(F)(c+dx)^3}\,\text{Gamma}\left(-\frac{1}{3},-b\log(F)(c+dx)^3\right)}{3d(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)/(c + d*x)^2,x]
```

```
[Out] -1/3*(F^a*Gamma[-1/3, -(b*(c + d*x)^3*Log[F])]*(-(b*(c + d*x)^3*Log[F]))^(1
/3))/(d*(c + d*x))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^2} \, dx = -\frac{F^a\Gamma\left(-\frac{1}{3},-b(c+dx)^3\log(F)\right)\sqrt[3]{-b(c+dx)^3\log(F)}}{3d(c+dx)}$$

Mathematica [A]
time = 0.33, size = 49, normalized size = 1.00

$$-\frac{F^a\Gamma\left(-\frac{1}{3},-b(c+dx)^3\log(F)\right)\sqrt[3]{-b(c+dx)^3\log(F)}}{3d(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)/(c + d*x)^2,x]
```

```
[Out] -1/3*(F^a*Gamma[-1/3, -(b*(c + d*x)^3*Log[F])]*(-(b*(c + d*x)^3*Log[F]))^(1
/3))/(d*(c + d*x))
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(dx+c)^3}}{(dx+c)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^3)/(d*x+c)^2,x)
```

```
[Out] int(F^(a+b*(d*x+c)^3)/(d*x+c)^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^2,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^2, x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 110 vs. $2(43) = 86$.
time = 0.10, size = 110, normalized size = 2.24

$$\frac{(-bd^3 \log(F))^{\frac{1}{3}} (dx+c) F^a \Gamma\left(\frac{2}{3}, -(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3)\log(F)\right) - F^{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a} d}{d^3x + cd^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] ((-b*d^3*log(F))^(1/3)*(d*x + c)*F^a*gamma(2/3, -(b*d^3*x^3 + 3*b*c*d^2*x^2
 + 3*b*c^2*d*x + b*c^3)*log(F)) - F^(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*
x + b*c^3 + a)*d)/(d^3*x + c*d^2)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)/(d*x+c)**2,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**3)/(c + d*x)**2, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^2,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^2, x)
```

Mupad [B]
time = 3.73, size = 74, normalized size = 1.51

$$-\frac{F^a\,\left(F^{b\,{\left(c+d\,x\right)}^3}-\Gamma\left(\frac{2}{3},-b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^3\right)\,{\left(-b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^3\right)}^{1/3}+\Gamma\left(\frac{2}{3}\right)\,{\left(-b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^3\right)}^{1/3}\right)}{d\,\left(c+d\,x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)/(c + d*x)^2,x)
```

```
[Out] -(F^a*(F^(b*(c + d*x)^3) - igamma(2/3, -b*log(F)*(c + d*x)^3)*(-b*log(F)*(c
 + d*x)^3)^(1/3) + gamma(2/3)*(-b*log(F)*(c + d*x)^3)^(1/3)))/(d*(c + d*x))
```

3.297 $\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^3}\,dx$

Optimal. Leaf size=49

$$-\frac{F^a\Gamma\left(-\frac{2}{3},-b(c+dx)^3\log(F)\right)\left(-b(c+dx)^3\log(F)\right)^{2/3}}{3d(c+dx)^2}$$

```
[Out] -1/3*F^a*GAMMA(-2/3,-b*(d*x+c)^3*ln(F))*(-b*(d*x+c)^3*ln(F))^(2/3)/d/(d*x+c
)^2
```

Rubi [A]
time = 0.04, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2250}

$$-\frac{F^a\left(-b\log(F)(c+dx)^3\right)^{2/3}\text{Gamma}\left(-\frac{2}{3},-b\log(F)(c+dx)^3\right)}{3d(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)/(c + d*x)^3,x]
```

```
[Out] -1/3*(F^a*Gamma[-2/3, -(b*(c + d*x)^3*Log[F])]*(-(b*(c + d*x)^3*Log[F]))^(2
/3))/(d*(c + d*x)^2)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^3}\,dx=-\frac{F^a\Gamma\left(-\frac{2}{3},-b(c+dx)^3\log(F)\right)\left(-b(c+dx)^3\log(F)\right)^{2/3}}{3d(c+dx)^2}$$

Mathematica [A]
time = 0.35, size = 49, normalized size = 1.00

$$-\frac{F^a\Gamma\left(-\frac{2}{3},-b(c+dx)^3\log(F)\right)\left(-b(c+dx)^3\log(F)\right)^{2/3}}{3d(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)/(c + d*x)^3,x]
```

```
[Out] -1/3*(F^a*Gamma[-2/3, -(b*(c + d*x)^3*Log[F])]*(-(b*(c + d*x)^3*Log[F]))^(2
/3))/(d*(c + d*x)^2)
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(dx+c)^3}}{(dx+c)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^3)/(d*x+c)^3,x)
```

```
[Out] int(F^(a+b*(d*x+c)^3)/(d*x+c)^3,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^3, x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 135 vs. $2(43) = 86$.
time = 0.09, size = 135, normalized size = 2.76

$$\frac{(-bd^3 \log(F))^{\frac{2}{3}} (d^2x^2 + 2\,cdx + c^2)F^a\Gamma\left(\frac{1}{3}, -(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3)\log(F)\right) - F^{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}d^2}{2\,(d^5x^2 + 2\,cd^4x + c^2d^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] 1/2*((-b*d^3*log(F))^(2/3)*(d^2*x^2 + 2*c*d*x + c^2)*F^a*gamma(1/3, -(b*d^3
*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F)) - F^(b*d^3*x^3 + 3*b*c*
d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)*d^2)/(d^5*x^2 + 2*c*d^4*x + c^2*d^3)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)/(d*x+c)**3,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**3)/(c + d*x)**3, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^3,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^3, x)
```

Mupad [B]
time = 3.83, size = 87, normalized size = 1.78

$$-\frac{F^a\,\left(3\,F^{b\,{\left(c+d\,x\right)}^3}\,\Gamma\left(\frac{2}{3}\right)-3\,\Gamma\left(\frac{2}{3}\right)\,\Gamma\left(\frac{1}{3},-b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^3\right)\,{\left(-b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^3\right)}^{2/3}+2\,\pi\,\sqrt{3}\,{\left(-b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^3\right)}^{2/3}\right)}{6\,d\,\Gamma\left(\frac{2}{3}\right)\,{\left(c+d\,x\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)/(c + d*x)^3,x)
```

```
[Out] -(F^a*(3*F^(b*(c + d*x)^3)*gamma(2/3) - 3*gamma(2/3)*igamma(1/3, -b*log(F)*
(c + d*x)^3)*(-b*log(F)*(c + d*x)^3)^(2/3) + 2*3^(1/2)*pi*(-b*log(F)*(c + d
*x)^3)^(2/3)))/(6*d*gamma(2/3)*(c + d*x)^2)
```

3.298 $\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^5}\,dx$

Optimal. Leaf size=49

$$-\frac{F^a\Gamma\left(-\frac{4}{3},-b(c+dx)^3\log(F)\right)\left(-b(c+dx)^3\log(F)\right)^{4/3}}{3d(c+dx)^4}$$

```
[Out] -1/3*F^a*GAMMA(-4/3,-b*(d*x+c)^3*ln(F))*(-b*(d*x+c)^3*ln(F))^(4/3)/d/(d*x+c
)^4
```

Rubi [A]
time = 0.04, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$-\frac{F^a\left(-b\log(F)(c+dx)^3\right)^{4/3}\text{Gamma}\left(-\frac{4}{3},-b\log(F)(c+dx)^3\right)}{3d(c+dx)^4}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)/(c + d*x)^5,x]
```

```
[Out] -1/3*(F^a*Gamma[-4/3, -(b*(c + d*x)^3*Log[F])]*(-(b*(c + d*x)^3*Log[F]))^(4
/3))/(d*(c + d*x)^4)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^5}\,dx = -\frac{F^a\Gamma\left(-\frac{4}{3},-b(c+dx)^3\log(F)\right)\left(-b(c+dx)^3\log(F)\right)^{4/3}}{3d(c+dx)^4}$$

Mathematica [A]
time = 0.39, size = 49, normalized size = 1.00

$$-\frac{F^a\Gamma\left(-\frac{4}{3},-b(c+dx)^3\log(F)\right)\left(-b(c+dx)^3\log(F)\right)^{4/3}}{3d(c+dx)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)/(c + d*x)^5,x]
```

```
[Out] -1/3*(F^a*Gamma[-4/3, -(b*(c + d*x)^3*Log[F])]*(-(b*(c + d*x)^3*Log[F]))^(4
/3))/(d*(c + d*x)^4)
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(dx+c)^3}}{(dx+c)^5}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^3)/(d*x+c)^5,x)
```

```
[Out] int(F^(a+b*(d*x+c)^3)/(d*x+c)^5,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^5,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^5, x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 226 vs. 2(43) = 86.
time = 0.11, size = 226, normalized size = 4.61

$$\frac{3\,(bd^4x^4+4\,bcd^3x^3+6\,bc^2d^2x^2+4\,bc^3dx+bc^4)(-bd^3\log(F))^{\frac{1}{3}}\,F^a\Gamma\left(\frac{2}{3},-(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3)\log(F)\right)\log(F)-\left(3\,(bd^4x^3+3\,bcd^3x^2+3\,bc^2d^2x+bc^3d)\log(F)+d\right)F^{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}}{4\,(d^6x^4+4\,cd^5x^3+6\,c^2d^4x^2+4\,c^3d^3x+c^4d^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^5,x, algorithm="fricas")
```

```
[Out] 1/4*(3*(b*d^4*x^4 + 4*b*c*d^3*x^3 + 6*b*c^2*d^2*x^2 + 4*b*c^3*d*x + b*c^4)*
(-b*d^3*log(F))^(1/3)*F^a*gamma(2/3, -(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*
d*x + b*c^3)*log(F))*log(F) - (3*(b*d^4*x^3 + 3*b*c*d^3*x^2 + 3*b*c^2*d^2*x
 + b*c^3*d)*log(F) + d)*F^(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3
+ a))/(d^6*x^4 + 4*c*d^5*x^3 + 6*c^2*d^4*x^2 + 4*c^3*d^3*x + c^4*d^2)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^5}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)/(d*x+c)**5,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**3)/(c + d*x)**5, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^5,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^5, x)
```

Mupad [B]
time = 4.47, size = 130, normalized size = 2.65

$$\frac{3\,F^a\,\Gamma\left(\frac{2}{3}\right)\,{\left(-b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^3\right)}^{4/3}}{4\,d\,{\left(c+d\,x\right)}^4}-\frac{F^a\,F^{b\,{\left(c+d\,x\right)}^3}}{4\,d\,{\left(c+d\,x\right)}^4}-\frac{3\,F^a\,\Gamma\left(\frac{2}{3},-b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^3\right)\,{\left(-b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^3\right)}^{4/3}}{4\,d\,{\left(c+d\,x\right)}^4}-\frac{3\,F^a\,F^{b\,{\left(c+d\,x\right)}^3}\,b\,\ln\left(F\right)}{4\,d\,\left(c+d\,x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)/(c + d*x)^5,x)
```

```
[Out] (3*F^a*gamma(2/3)*(-b*log(F)*(c + d*x)^3)^(4/3))/(4*d*(c + d*x)^4) - (F^a*F
^(b*(c + d*x)^3))/(4*d*(c + d*x)^4) - (3*F^a*igamma(2/3, -b*log(F)*(c + d*x
)^3)*(-b*log(F)*(c + d*x)^3)^(4/3))/(4*d*(c + d*x)^4) - (3*F^a*F^(b*(c + d*
x)^3)*b*log(F))/(4*d*(c + d*x))
```

3.299 $\int f^{a+b\sqrt{c+dx}}\,dx$

Optimal. Leaf size=64

$$-\frac{2f^{a+b\sqrt{c+dx}}}{b^2d\log^2(f)}+\frac{2f^{a+b\sqrt{c+dx}}\sqrt{c+dx}}{bd\log(f)}$$

```
[Out] -2*f^(a+b*(d*x+c)^(1/2))/b^2/d/ln(f)^2+2*f^(a+b*(d*x+c)^(1/2))*(d*x+c)^(1/2
)/b/d/ln(f)
```

Rubi [A]
time = 0.02, antiderivative size = 64, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}=0.200$, Rules used = {2238, 2207, 2225}

$$\frac{2\sqrt{c+dx}\,f^{a+b\sqrt{c+dx}}}{bd\log(f)}-\frac{2f^{a+b\sqrt{c+dx}}}{b^2d\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*Sqrt[c + d*x]),x]
```

```
[Out] (-2*f^(a + b*Sqrt[c + d*x]))/(b^2*d*Log[f]^2) + (2*f^(a + b*Sqrt[c + d*x])*
Sqrt[c + d*x])/(b*d*Log[f])
```

Rule 2207

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[(c + d*x)^m*((b*F^(g*(e + f*x)))^n/(f*g*n*Log[F])),
x] - Dist[d*(m/(f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !TrueQ[$UseGamma]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2238

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> With[{k =
Denominator[n]}, Dist[k/d, Subst[Int[x^(k - 1)*F^(a + b*x^(k*n)), x], x, (c
 + d*x)^(1/k)], x]] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] &&  !Inte
gerQ[n]
```

Rubi steps

$$\int f^{a+b\sqrt{c+dx}}\,dx = \frac{2\text{Subst}\left(\int f^{a+bx}x\,dx, x, \sqrt{c+dx}\right)}{d}$$
$$= \frac{2f^{a+b\sqrt{c+dx}}\sqrt{c+dx}}{bd\log(f)} - \frac{2\text{Subst}\left(\int f^{a+bx}\,dx, x, \sqrt{c+dx}\right)}{bd\log(f)}$$
$$= -\frac{2f^{a+b\sqrt{c+dx}}}{b^2d\log^2(f)} + \frac{2f^{a+b\sqrt{c+dx}}\sqrt{c+dx}}{bd\log(f)}$$

Mathematica [A]
time = 0.04, size = 42, normalized size = 0.66

$$\frac{2f^{a+b\sqrt{c+dx}}\left(-1+b\sqrt{c+dx}\log(f)\right)}{b^2d\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*Sqrt[c + d*x]),x]
[Out] (2*f^(a + b*Sqrt[c + d*x])*(-1 + b*Sqrt[c + d*x]*Log[f]))/(b^2*d*Log[f]^2)
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int f^{a+b\sqrt{dx+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b*(d*x+c)^(1/2)),x)
[Out] int(f^(a+b*(d*x+c)^(1/2)),x)
```

Maxima [A]
time = 0.28, size = 43, normalized size = 0.67

$$\frac{2\left(\sqrt{dx+c}\,bf^a\log(f) - f^a\right)f^{\sqrt{dx+c}\,b}}{b^2d\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*(d*x+c)^(1/2)),x, algorithm="maxima")
[Out] 2*(sqrt(d*x + c)*b*f^a*log(f) - f^a)*f^(sqrt(d*x + c)*b)/(b^2*d*log(f)^2)
```

Fricas [A]
time = 0.36, size = 42, normalized size = 0.66

$$\frac{2\left(\sqrt{dx+c}\,b\log\left(f\right)-1\right)e^{\left(\sqrt{dx+c}\,b\log(f)+a\log(f)\right)}}{b^{2}d\log\left(f\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*(d*x+c)^(1/2)),x, algorithm="fricas")
```

```
[Out] 2*(sqrt(d*x + c)*b*log(f) - 1)*e^(sqrt(d*x + c)*b*log(f) + a*log(f))/(b^2*d
*log(f)^2)
```

Sympy [A]
time = 0.26, size = 80, normalized size = 1.25

$$\begin{cases} x & \text{for}\ f=1\wedge\left(b=0\vee f=1\right)\wedge\left(d=0\vee f=1\right) \\ f^{a+b\sqrt{c}}x & \text{for}\ d=0 \\ f^{a}x & \text{for}\ b=0 \\ \frac{2f^{a}f^{b\sqrt{c+dx}}\sqrt{c+dx}}{bd\log\left(f\right)}-\frac{2f^{a}f^{b\sqrt{c+dx}}}{b^{2}d\log\left(f\right)^{2}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*(d*x+c)**(1/2)),x)
```

```
[Out] Piecewise((x, Eq(f, 1) & (Eq(b, 0) | Eq(f, 1)) & (Eq(d, 0) | Eq(f, 1))), (f
**(a + b*sqrt(c))*x, Eq(d, 0)), (f**a*x, Eq(b, 0)), (2*f**a*f**(b*sqrt(c +
d*x))*sqrt(c + d*x)/(b*d*log(f)) - 2*f**a*f**(b*sqrt(c + d*x))/(b**2*d*log(
f)**2), True))
```

Giac [C] Result contains complex when optimal does not.
time = 4.98, size = 781, normalized size = 12.20

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*(d*x+c)^(1/2)),x, algorithm="giac")
```

```
[Out] (2*(2*((pi*b^2*log(abs(f))*sgn(f) - pi*b^2*log(abs(f)))*(pi*sqrt(d*x + c)*b
*sgn(f) - pi*sqrt(d*x + c)*b)/((pi^2*b^2*sgn(f) - pi^2*b^2 + 2*b^2*log(abs(
f))^2)^2 + 4*(pi*b^2*log(abs(f))*sgn(f) - pi*b^2*log(abs(f)))^2) + (pi^2*b^
2*sgn(f) - pi^2*b^2 + 2*b^2*log(abs(f))^2)*(sqrt(d*x + c)*b*log(abs(f)) - 1
)/((pi^2*b^2*sgn(f) - pi^2*b^2 + 2*b^2*log(abs(f))^2)^2 + 4*(pi*b^2*log(abs
(f))*sgn(f) - pi*b^2*log(abs(f)))^2))*cos(-1/2*pi*sqrt(d*x + c)*b*sgn(f) -
1/2*pi*a*sgn(f) + 1/2*pi*sqrt(d*x + c)*b + 1/2*pi*a) + ((pi^2*b^2*sgn(f) -
```

```
pi^2*b^2 + 2*b^2*log(abs(f))^2)*(pi*sqrt(d*x + c)*b*sgn(f) - pi*sqrt(d*x +
c)*b)/((pi^2*b^2*sgn(f) - pi^2*b^2 + 2*b^2*log(abs(f))^2)^2 + 4*(pi*b^2*log
(abs(f))*sgn(f) - pi*b^2*log(abs(f)))^2) - 4*(pi*b^2*log(abs(f))*sgn(f) - p
i*b^2*log(abs(f)))*(sqrt(d*x + c)*b*log(abs(f)) - 1)/((pi^2*b^2*sgn(f) - pi
^2*b^2 + 2*b^2*log(abs(f))^2)^2 + 4*(pi*b^2*log(abs(f))*sgn(f) - pi*b^2*log
(abs(f)))^2))*sin(-1/2*pi*sqrt(d*x + c)*b*sgn(f) - 1/2*pi*a*sgn(f) + 1/2*pi
*sqrt(d*x + c)*b + 1/2*pi*a))*e^(sqrt(d*x + c)*b*log(abs(f)) + a*log(abs(f)
)) - I*((pi*sqrt(d*x + c)*b*sgn(f) - pi*sqrt(d*x + c)*b - 2*I*sqrt(d*x + c)
*b*log(abs(f)) + 2*I)*e^(1/2*I*pi*sqrt(d*x + c)*b*sgn(f) + 1/2*I*pi*a*sgn(f
) - 1/2*I*pi*sqrt(d*x + c)*b - 1/2*I*pi*a)/(pi^2*b^2*sgn(f) + 2*I*pi*b^2*lo
g(abs(f))*sgn(f) - pi^2*b^2 - 2*I*pi*b^2*log(abs(f)) + 2*b^2*log(abs(f))^2)
 + (pi*sqrt(d*x + c)*b*sgn(f) - pi*sqrt(d*x + c)*b + 2*I*sqrt(d*x + c)*b*lo
g(abs(f)) - 2*I)*e^(-1/2*I*pi*sqrt(d*x + c)*b*sgn(f) - 1/2*I*pi*a*sgn(f) +
1/2*I*pi*sqrt(d*x + c)*b + 1/2*I*pi*a)/(pi^2*b^2*sgn(f) - 2*I*pi*b^2*log(ab
s(f))*sgn(f) - pi^2*b^2 + 2*I*pi*b^2*log(abs(f)) + 2*b^2*log(abs(f))^2))*e^
(sqrt(d*x + c)*b*log(abs(f)) + a*log(abs(f))))/d
```

Mupad [B]

time = 3.60, size = 38, normalized size = 0.59

$$\frac{f^{a+b\,\sqrt{c+d\,x}}\,\left(2\,b\,\ln\left(f\right)\,\sqrt{c+d\,x}-2\right)}{b^2\,d\,{\ln\left(f\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*(c + d*x)^(1/2)),x)
```

```
[Out] (f^(a + b*(c + d*x)^(1/2))*(2*b*log(f)*(c + d*x)^(1/2) - 2))/(b^2*d*log(f)^
2)
```

3.300 $\int f^{a+b\sqrt[3]{c+dx}}\,dx$

Optimal. Leaf size=100

$$\frac{6f^{a+b\sqrt[3]{c+dx}}}{b^3d\log^3(f)}-\frac{6f^{a+b\sqrt[3]{c+dx}}\sqrt[3]{c+dx}}{b^2d\log^2(f)}+\frac{3f^{a+b\sqrt[3]{c+dx}}(c+dx)^{2/3}}{bd\log(f)}$$

```
[Out] 6*f^(a+b*(d*x+c)^(1/3))/b^3/d/ln(f)^3-6*f^(a+b*(d*x+c)^(1/3))*(d*x+c)^(1/3)
/b^2/d/ln(f)^2+3*f^(a+b*(d*x+c)^(1/3))*(d*x+c)^(2/3)/b/d/ln(f)
```

Rubi [A]
time = 0.04, antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}=0.200$, Rules used = {2238, 2207, 2225}

$$\frac{6f^{a+b\sqrt[3]{c+dx}}}{b^3d\log^3(f)}-\frac{6\sqrt[3]{c+dx}\,f^{a+b\sqrt[3]{c+dx}}}{b^2d\log^2(f)}+\frac{3(c+dx)^{2/3}f^{a+b\sqrt[3]{c+dx}}}{bd\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*(c + d*x)^(1/3)),x]
```

```
[Out] (6*f^(a + b*(c + d*x)^(1/3)))/(b^3*d*Log[f]^3) - (6*f^(a + b*(c + d*x)^(1/3
))*(c + d*x)^(1/3))/(b^2*d*Log[f]^2) + (3*f^(a + b*(c + d*x)^(1/3))*(c + d*
x)^(2/3))/(b*d*Log[f])
```

Rule 2207

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[(c + d*x)^m*((b*F^(g*(e + f*x)))^n/(f*g*n*Log[F])),
x] - Dist[d*(m/(f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] && !TrueQ[$UseGamma]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2238

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> With[{k =
Denominator[n]}, Dist[k/d, Subst[Int[x^(k - 1)*F^(a + b*x^(k*n)), x], x, (c
 + d*x)^(1/k)], x]] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && !Inte
gerQ[n]
```

Rubi steps

$$\int f^{a+b\sqrt[3]{c+dx}}\,dx = \frac{3\text{Subst}\left(\int f^{a+bx}x^2\,dx, x, \sqrt[3]{c+dx}\right)}{d}$$
$$= \frac{3f^{a+b\sqrt[3]{c+dx}}(c+dx)^{2/3}}{bd\log(f)} - \frac{6\text{Subst}\left(\int f^{a+bx}x\,dx, x, \sqrt[3]{c+dx}\right)}{bd\log(f)}$$
$$= -\frac{6f^{a+b\sqrt[3]{c+dx}}\sqrt[3]{c+dx}}{b^2d\log^2(f)} + \frac{3f^{a+b\sqrt[3]{c+dx}}(c+dx)^{2/3}}{bd\log(f)} + \frac{6\text{Subst}\left(\int f^{a+bx}\,dx, x, \sqrt[3]{c+dx}\right)}{b^2d\log^2(f)}$$
$$= \frac{6f^{a+b\sqrt[3]{c+dx}}}{b^3d\log^3(f)} - \frac{6f^{a+b\sqrt[3]{c+dx}}\sqrt[3]{c+dx}}{b^2d\log^2(f)} + \frac{3f^{a+b\sqrt[3]{c+dx}}(c+dx)^{2/3}}{bd\log(f)}$$

Mathematica [A]
time = 0.03, size = 60, normalized size = 0.60

$$\frac{3f^{a+b\sqrt[3]{c+dx}}\left(2-2b\sqrt[3]{c+dx}\log(f)+b^2(c+dx)^{2/3}\log^2(f)\right)}{b^3d\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*(c + d*x)^(1/3)),x]
```

```
[Out] (3*f^(a + b*(c + d*x)^(1/3))*(2 - 2*b*(c + d*x)^(1/3)*Log[f] + b^2*(c + d*x
)^(2/3)*Log[f]^2))/(b^3*d*Log[f]^3)
```

Maple [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+b(dx+c)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b*(d*x+c)^(1/3)),x)
```

```
[Out] int(f^(a+b*(d*x+c)^(1/3)),x)
```

Maxima [A]
time = 0.28, size = 62, normalized size = 0.62

$$\frac{3\left((dx+c)^{\frac{2}{3}}b^2f^a\log(f)^2 - 2(dx+c)^{\frac{1}{3}}bf^a\log(f) + 2f^a\right)f^{(dx+c)^{\frac{1}{3}}b}}{b^3d\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(a+b*(d*x+c)^(1/3)),x, algorithm="maxima")

[Out] 3*((d*x + c)^(2/3)*b^2*f^a*log(f)^2 - 2*(d*x + c)^(1/3)*b*f^a*log(f) + 2*f^a)*f^((d*x + c)^(1/3)*b)/(b^3*d*log(f)^3)

Fricas [A]
time = 0.41, size = 58, normalized size = 0.58

$$\frac{3\left((dx+c)^{\frac{2}{3}}b^2\log(f)^2-2(dx+c)^{\frac{1}{3}}b\log(f)+2\right)e^{\left((dx+c)^{\frac{1}{3}}b\log(f)+a\log(f)\right)}}{b^3d\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(a+b*(d*x+c)^(1/3)),x, algorithm="fricas")

[Out] 3*((d*x + c)^(2/3)*b^2*log(f)^2 - 2*(d*x + c)^(1/3)*b*log(f) + 2)*e^((d*x + c)^(1/3)*b*log(f) + a*log(f))/(b^3*d*log(f)^3)

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+b\sqrt[3]{c+dx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f**(a+b*(d*x+c)**(1/3)),x)

[Out] Integral(f**(a + b*(c + d*x)**(1/3)), x)

Giac [C] Result contains complex when optimal does not.
time = 3.88, size = 1338, normalized size = 13.38

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(a+b*(d*x+c)^(1/3)),x, algorithm="giac")

[Out] 3*((((3*pi^2*b^3*log(abs(f))*sgn(f) - 3*pi^2*b^3*log(abs(f)) + 2*b^3*log(abs(f))^3)*(pi^2*(d*x + c)^(2/3)*b^2*sgn(f) - pi^2*(d*x + c)^(2/3)*b^2 + 2*(d*x + c)^(2/3)*b^2*log(abs(f))^2 - 4*(d*x + c)^(1/3)*b*log(abs(f)) + 4)/((pi^3*b^3*sgn(f) - 3*pi*b^3*log(abs(f))^2*sgn(f) - pi^3*b^3 + 3*pi*b^3*log(abs(f))^2)^2 + (3*pi^2*b^3*log(abs(f))*sgn(f) - 3*pi^2*b^3*log(abs(f)) + 2*b^3*log(abs(f))^3)^2) - 2*(pi^3*b^3*sgn(f) - 3*pi*b^3*log(abs(f))^2*sgn(f) - pi^3*b^3 + 3*pi*b^3*log(abs(f))^2)*(pi*(d*x + c)^(2/3)*b^2*log(abs(f))*sgn(f) - pi*(d*x + c)^(2/3)*b^2*log(abs(f)) - pi*(d*x + c)^(1/3)*b*sgn(f) + pi*(d*x + c)^(1/3)*b)/((pi^3*b^3*sgn(f) - 3*pi*b^3*log(abs(f))^2*sgn(f) - pi^3*b^3 + 3*pi*b^3*log(abs(f))^2)^2 + (3*pi^2*b^3*log(abs(f))*sgn(f) - 3*pi^2*b

```
^3*log(abs(f)) + 2*b^3*log(abs(f))^3)^2))*cos(-1/2*pi*(d*x + c)^(1/3)*b*sgn
(f) - 1/2*pi*a*sgn(f) + 1/2*pi*(d*x + c)^(1/3)*b + 1/2*pi*a) + ((pi^3*b^3*s
gn(f) - 3*pi*b^3*log(abs(f))^2*sgn(f) - pi^3*b^3 + 3*pi*b^3*log(abs(f))^2)*
(pi^2*(d*x + c)^(2/3)*b^2*sgn(f) - pi^2*(d*x + c)^(2/3)*b^2 + 2*(d*x + c)^(
2/3)*b^2*log(abs(f))^2 - 4*(d*x + c)^(1/3)*b*log(abs(f)) + 4)/((pi^3*b^3*sg
n(f) - 3*pi*b^3*log(abs(f))^2*sgn(f) - pi^3*b^3 + 3*pi*b^3*log(abs(f))^2)^2
 + (3*pi^2*b^3*log(abs(f))*sgn(f) - 3*pi^2*b^3*log(abs(f)) + 2*b^3*log(abs(
f))^3)^2) + 2*(3*pi^2*b^3*log(abs(f))*sgn(f) - 3*pi^2*b^3*log(abs(f)) + 2*b
^3*log(abs(f))^3)*(pi*(d*x + c)^(2/3)*b^2*log(abs(f))*sgn(f) - pi*(d*x + c)
^(2/3)*b^2*log(abs(f)) - pi*(d*x + c)^(1/3)*b*sgn(f) + pi*(d*x + c)^(1/3)*b
)/((pi^3*b^3*sgn(f) - 3*pi*b^3*log(abs(f))^2*sgn(f) - pi^3*b^3 + 3*pi*b^3*l
og(abs(f))^2)^2 + (3*pi^2*b^3*log(abs(f))*sgn(f) - 3*pi^2*b^3*log(abs(f)) +
 2*b^3*log(abs(f))^3)^2))*sin(-1/2*pi*(d*x + c)^(1/3)*b*sgn(f) - 1/2*pi*a*s
gn(f) + 1/2*pi*(d*x + c)^(1/3)*b + 1/2*pi*a))*e^((d*x + c)^(1/3)*b*log(abs(
f)) + a*log(abs(f))) - 2*I*((-I*pi^2*(d*x + c)^(2/3)*b^2*sgn(f) + 2*pi*(d*x
 + c)^(2/3)*b^2*log(abs(f))*sgn(f) + I*pi^2*(d*x + c)^(2/3)*b^2 - 2*pi*(d*x
 + c)^(2/3)*b^2*log(abs(f)) - 2*I*(d*x + c)^(2/3)*b^2*log(abs(f))^2 - 2*pi*
(d*x + c)^(1/3)*b*sgn(f) + 2*pi*(d*x + c)^(1/3)*b + 4*I*(d*x + c)^(1/3)*b*l
og(abs(f)) - 4*I)*e^(1/2*I*pi*(d*x + c)^(1/3)*b*sgn(f) + 1/2*I*pi*a*sgn(f)
- 1/2*I*pi*(d*x + c)^(1/3)*b - 1/2*I*pi*a)/(-4*I*pi^3*b^3*sgn(f) + 12*pi^2*
b^3*log(abs(f))*sgn(f) + 12*I*pi*b^3*log(abs(f))^2*sgn(f) + 4*I*pi^3*b^3 -
12*pi^2*b^3*log(abs(f)) - 12*I*pi*b^3*log(abs(f))^2 + 8*b^3*log(abs(f))^3)
- (-I*pi^2*(d*x + c)^(2/3)*b^2*sgn(f) - 2*pi*(d*x + c)^(2/3)*b^2*log(abs(f)
)*sgn(f) + I*pi^2*(d*x + c)^(2/3)*b^2 + 2*pi*(d*x + c)^(2/3)*b^2*log(abs(f)
) - 2*I*(d*x + c)^(2/3)*b^2*log(abs(f))^2 + 2*pi*(d*x + c)^(1/3)*b*sgn(f) -
 2*pi*(d*x + c)^(1/3)*b + 4*I*(d*x + c)^(1/3)*b*log(abs(f)) - 4*I)*e^(-1/2*
I*pi*(d*x + c)^(1/3)*b*sgn(f) - 1/2*I*pi*a*sgn(f) + 1/2*I*pi*(d*x + c)^(1/3
)*b + 1/2*I*pi*a)/(4*I*pi^3*b^3*sgn(f) + 12*pi^2*b^3*log(abs(f))*sgn(f) - 1
2*I*pi*b^3*log(abs(f))^2*sgn(f) - 4*I*pi^3*b^3 - 12*pi^2*b^3*log(abs(f)) +
12*I*pi*b^3*log(abs(f))^2 + 8*b^3*log(abs(f))^3))*e^((d*x + c)^(1/3)*b*log(
abs(f)) + a*log(abs(f))))/d
```

Mupad [B]
time = 3.58, size = 54, normalized size = 0.54

$$\frac{f^{a+b\,(c+d\,x)^{1/3}}\,\left(3\,b^2\ln\left(f\right)^2\,\left(c+d\,x\right)^{2/3}-6\,b\,\ln\left(f\right)\,\left(c+d\,x\right)^{1/3}+6\right)}{b^3\,d\ln\left(f\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*(c + d*x)^(1/3)),x)
```

```
[Out] (f^(a + b*(c + d*x)^(1/3))*(3*b^2*log(f)^2*(c + d*x)^(2/3) - 6*b*log(f)*(c
+ d*x)^(1/3) + 6))/(b^3*d*log(f)^3)
```

3.301 $\int F^{a+\frac{b}{c+dx}}(c+dx)^m\,dx$

Optimal. Leaf size=50

$$\frac{F^a(c+dx)^{1+m}\Gamma\left(-1-m,-\frac{b\log(F)}{c+dx}\right)\left(-\frac{b\log(F)}{c+dx}\right)^{1+m}}{d}$$

```
[Out] F^a*(d*x+c)^(1+m)*GAMMA(-1-m,-b*ln(F)/(d*x+c))*(-b*ln(F)/(d*x+c))^(1+m)/d
```

Rubi [A]
time = 0.03, antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$\frac{F^a(c+dx)^{m+1}\left(-\frac{b\log(F)}{c+dx}\right)^{m+1}\text{Gamma}\left(-m-1,-\frac{b\log(F)}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))*(c + d*x)^m,x]
```

```
[Out] (F^a*(c + d*x)^(1 + m)*Gamma[-1 - m, -((b*Log[F])/(c + d*x))]*(-((b*Log[F])
/(c + d*x)))^(1 + m))/d
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{c+dx}}(c+dx)^m\,dx = \frac{F^a(c+dx)^{1+m}\Gamma\left(-1-m,-\frac{b\log(F)}{c+dx}\right)\left(-\frac{b\log(F)}{c+dx}\right)^{1+m}}{d}$$

Mathematica [A]
time = 0.02, size = 50, normalized size = 1.00

$$\frac{F^a(c+dx)^{1+m}\Gamma\left(-1-m,-\frac{b\log(F)}{c+dx}\right)\left(-\frac{b\log(F)}{c+dx}\right)^{1+m}}{d}$$

Antiderivative was successfully verified.

[In] Integrate[F^(a + b/(c + d*x))*(c + d*x)^m,x]

[Out] (F^a*(c + d*x)^(1 + m)*Gamma[-1 - m, -((b*Log[F])/(c + d*x))]*(-((b*Log[F])/(c + d*x)))^(1 + m))/d

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{dx+c}} (dx+c)^{m}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a+b/(d*x+c))*(d*x+c)^m,x)

[Out] int(F^(a+b/(d*x+c))*(d*x+c)^m,x)

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c))*(d*x+c)^m,x, algorithm="maxima")

[Out] integrate((d*x + c)^m*F^(a + b/(d*x + c)), x)

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c))*(d*x+c)^m,x, algorithm="fricas")

[Out] integral((d*x + c)^m*F^((a*d*x + a*c + b)/(d*x + c)), x)

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{c+dx}} (c+dx)^{m}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F**(a+b/(d*x+c))*(d*x+c)**m,x)

[Out] Integral(F**(a + b/(c + d*x))*(c + d*x)**m, x)

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c)^m,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^m*F^(a + b/(d*x + c)), x)
```

Mupad [B]
time = 3.67, size = 73, normalized size = 1.46

$$\frac{F^a\,e^{\frac{b\,\ln(F)}{2\,(c+d\,x)}}\,(c+d\,x)^{m+1}\,\mathrm{M}_{\frac{m}{2}+1,-\frac{m}{2}-\frac{1}{2}}\left(\frac{b\,\ln(F)}{c+d\,x}\right)\,\left(\frac{b\,\ln(F)}{c+d\,x}\right)^{m/2}}{d\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))*(c + d*x)^m,x)
```

```
[Out] (F^a*exp((b*log(F))/(2*(c + d*x)))*(c + d*x)^(m + 1)*whittakerM(m/2 + 1, -
m/2 - 1/2, (b*log(F))/(c + d*x))*((b*log(F))/(c + d*x))^(m/2))/(d*(m + 1))
```

3.302 $\int F^{a+\frac{b}{c+dx}}(c+dx)^4\,dx$

Optimal. Leaf size=29

$$-\frac{b^5F^a\Gamma\left(-5,-\frac{b\log(F)}{c+dx}\right)\log^5(F)}{d}$$

```
[Out] F^a*(d*x+c)^5*Ei(6,-b*ln(F)/(d*x+c))/d
```

Rubi [A]
time = 0.03, antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2250}

$$-\frac{b^5F^a\log^5(F)\text{Gamma}\left(-5,-\frac{b\log(F)}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))*(c + d*x)^4,x]
```

```
[Out] -((b^5*F^a*Gamma[-5, -((b*Log[F])/(c + d*x))]*Log[F]^5)/d)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{c+dx}}(c+dx)^4\,dx=-\frac{b^5F^a\Gamma\left(-5,-\frac{b\log(F)}{c+dx}\right)\log^5(F)}{d}$$

Mathematica [A]
time = 0.01, size = 29, normalized size = 1.00

$$-\frac{b^5F^a\Gamma\left(-5,-\frac{b\log(F)}{c+dx}\right)\log^5(F)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))*(c + d*x)^4,x]
```

```
[Out] -((b^5*F^a*Gamma[-5, -((b*Log[F])/(c + d*x))]*Log[F]^5)/d)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 533 vs. $2(28) = 56$.
time = 0.12, size = 534, normalized size = 18.41

method	result
risch	$\frac{d^4 F^a F^{\frac{b}{dx+c}} x^5}{5} + d^3 F^a F^{\frac{b}{dx+c}} c\, x^4 + 2d^2 F^a F^{\frac{b}{dx+c}} c^2 x^3 + 2d\, F^a F^{\frac{b}{dx+c}} c^3 x^2 + F^a F^{\frac{b}{dx+c}} c^4 x + \frac{F^a F^{\frac{b}{dx+c}} c^5}{5d} +$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c))*(d*x+c)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/5*d^4*F^a*F^(b/(d*x+c))*x^5+d^3*F^a*F^(b/(d*x+c))*c*x^4+2*d^2*F^a*F^(b/(d
*x+c))*c^2*x^3+2*d*F^a*F^(b/(d*x+c))*c^3*x^2+F^a*F^(b/(d*x+c))*c^4*x+1/5/d*
F^a*F^(b/(d*x+c))*c^5+1/20*d^3*b*ln(F)*F^a*F^(b/(d*x+c))*x^4+1/5*d^2*b*ln(F
)*F^a*F^(b/(d*x+c))*c*x^3+3/10*d*b*ln(F)*F^a*F^(b/(d*x+c))*c^2*x^2+1/5*b*ln
(F)*F^a*F^(b/(d*x+c))*c^3*x+1/20/d*b*ln(F)*F^a*F^(b/(d*x+c))*c^4+1/60*d^2*b
^2*ln(F)^2*F^a*F^(b/(d*x+c))*x^3+1/20*d*b^2*ln(F)^2*F^a*F^(b/(d*x+c))*c*x^2
+1/20*b^2*ln(F)^2*F^a*F^(b/(d*x+c))*c^2*x+1/60/d*b^2*ln(F)^2*F^a*F^(b/(d*x+
c))*c^3+1/120*d*b^3*ln(F)^3*F^a*F^(b/(d*x+c))*x^2+1/60*b^3*ln(F)^3*F^a*F^(b
/(d*x+c))*c*x+1/120/d*b^3*ln(F)^3*F^a*F^(b/(d*x+c))*c^2+1/120*b^4*ln(F)^4*F
^a*F^(b/(d*x+c))*x+1/120/d*b^4*ln(F)^4*F^a*F^(b/(d*x+c))*c+1/120/d*b^5*ln(F
)^5*F^a*Ei(1,-b*ln(F)/(d*x+c))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c)^4,x, algorithm="maxima")
```

```
[Out] 1/120*(24*F^a*d^4*x^5 + 6*(F^a*b*d^3*log(F) + 20*F^a*c*d^3)*x^4 + 2*(F^a*b^
2*d^2*log(F)^2 + 12*F^a*b*c*d^2*log(F) + 120*F^a*c^2*d^2)*x^3 + (F^a*b^3*d*
log(F)^3 + 6*F^a*b^2*c*d*log(F)^2 + 36*F^a*b*c^2*d*log(F) + 240*F^a*c^3*d)*
x^2 + (F^a*b^4*log(F)^4 + 2*F^a*b^3*c*log(F)^3 + 6*F^a*b^2*c^2*log(F)^2 + 2
4*F^a*b*c^3*log(F) + 120*F^a*c^4)*x)*F^(b/(d*x + c)) + integrate(1/120*(F^a
*b^5*d*x*log(F)^5 - F^a*b^4*c^2*log(F)^4 - 2*F^a*b^3*c^3*log(F)^3 - 6*F^a*b
^2*c^4*log(F)^2 - 24*F^a*b*c^5*log(F))*F^(b/(d*x + c))/(d^2*x^2 + 2*c*d*x +
 c^2), x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 244 vs. $2(28) = 56$.
time = 0.08, size = 244, normalized size = 8.41

$$-\frac{F^a b^5 \mathrm{Ei}\left(\frac{b\log(F)}{dx+c}\right)\log\left(F\right)^5 - \left(24\,d^5x^5 + 120\,cd^4x^4 + 240\,c^2d^3x^3 + 240\,c^3d^2x^2 + 120\,c^4dx + 24\,c^5 + \left(b^4dx + b^4c\right)\log\left(F\right)^4 + \left(b^3d^2x^2 + 2\,b^3cdx + b^3c^2\right)\log\left(F\right)^3 + 2\left(b^2d^3x^3 + 3\,b^2cd^2x^2 + 3\,b^2c^2dx + b^2c^3\right)\log\left(F\right)^2 + 6\left(bd^4x^4 + 4\,bcd^3x^3 + 6\,bc^2d^2x^2 + 4\,bc^3dx + bc^4\right)\log\left(F\right)\right)F^{\frac{adx+ac+b}{dx+c}}}{120\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] -1/120*(F^a*b^5*Ei(b*log(F)/(d*x + c))*log(F)^5 - (24*d^5*x^5 + 120*c*d^4*x
^4 + 240*c^2*d^3*x^3 + 240*c^3*d^2*x^2 + 120*c^4*d*x + 24*c^5 + (b^4*d*x +
b^4*c)*log(F)^4 + (b^3*d^2*x^2 + 2*b^3*c*d*x + b^3*c^2)*log(F)^3 + 2*(b^2*d
^3*x^3 + 3*b^2*c*d^2*x^2 + 3*b^2*c^2*d*x + b^2*c^3)*log(F)^2 + 6*(b*d^4*x^4
 + 4*b*c*d^3*x^3 + 6*b*c^2*d^2*x^2 + 4*b*c^3*d*x + b*c^4)*log(F))*F^((a*d*x
 + a*c + b)/(d*x + c)))/d
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{c+dx}}(c+dx)^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))*(d*x+c)**4,x)
```

```
[Out] Integral(F**(a + b/(c + d*x))*(c + d*x)**4, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c)^4,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^4*F^(a + b/(d*x + c)), x)
```

Mupad [B]
time = 3.67, size = 181, normalized size = 6.24

$$\frac{F^a\,F^{\frac{b}{c+d\,x}}\,{\left(c+d\,x\right)}^5}{5\,d}+\frac{F^a\,b^5\,{\ln\left(F\right)}^5\,\mathrm{expint}\left(-\frac{b\,\ln(F)}{c+d\,x}\right)}{120\,d}+\frac{F^a\,F^{\frac{b}{c+d\,x}}\,b^2\,{\ln\left(F\right)}^2\,{\left(c+d\,x\right)}^3}{60\,d}+\frac{F^a\,F^{\frac{b}{c+d\,x}}\,b^3\,{\ln\left(F\right)}^3\,{\left(c+d\,x\right)}^2}{120\,d}+\frac{F^a\,F^{\frac{b}{c+d\,x}}\,b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^4}{20\,d}+\frac{F^a\,F^{\frac{b}{c+d\,x}}\,b^4\,{\ln\left(F\right)}^4\,\left(c+d\,x\right)}{120\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))*(c + d*x)^4,x)
```

```
[Out] (F^a*F^(b/(c + d*x))*(c + d*x)^5)/(5*d) + (F^a*b^5*log(F)^5*expint(-(b*log(
F))/(c + d*x)))/(120*d) + (F^a*F^(b/(c + d*x))*b^2*log(F)^2*(c + d*x)^3)/(6
0*d) + (F^a*F^(b/(c + d*x))*b^3*log(F)^3*(c + d*x)^2)/(120*d) + (F^a*F^(b/(
c + d*x))*b*log(F)*(c + d*x)^4)/(20*d) + (F^a*F^(b/(c + d*x))*b^4*log(F)^4*
(c + d*x))/(120*d)
```

3.303 $\int F^{a+\frac{b}{c+dx}}(c+dx)^3\,dx$

Optimal. Leaf size=28

$$\frac{b^4F^a\Gamma\left(-4,-\frac{b\log(F)}{c+dx}\right)\log^4(F)}{d}$$

[Out] F^a*(d*x+c)^4*Ei(5,-b*ln(F)/(d*x+c))/d

Rubi [A]
time = 0.03, antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$\frac{b^4F^a\log^4(F)\text{Gamma}\left(-4,-\frac{b\log(F)}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

[In] Int[F^(a + b/(c + d*x))*(c + d*x)^3,x]

[Out] (b^4*F^a*Gamma[-4, -((b*Log[F])/(c + d*x))]*Log[F]^4)/d

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{c+dx}}(c+dx)^3\,dx=\frac{b^4F^a\Gamma\left(-4,-\frac{b\log(F)}{c+dx}\right)\log^4(F)}{d}$$

Mathematica [A]
time = 0.01, size = 28, normalized size = 1.00

$$\frac{b^4F^a\Gamma\left(-4,-\frac{b\log(F)}{c+dx}\right)\log^4(F)}{d}$$

Antiderivative was successfully verified.

[In] Integrate[F^(a + b/(c + d*x))*(c + d*x)^3,x]

```
[Out] (b^4*F^a*Gamma[-4, -((b*Log[F])/(c + d*x))]*Log[F]^4)/d
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 367 vs. $2(28) = 56$.
time = 0.12, size = 368, normalized size = 13.14

method	result
risch	$\frac{d^3 F^a F^{\frac{b}{dx+c}} x^4}{4} + d^2 F^a F^{\frac{b}{dx+c}} c\, x^3 + \frac{3d\, F^a F^{\frac{b}{dx+c}} c^2 x^2}{2} + F^a F^{\frac{b}{dx+c}} c^3 x + \frac{F^a F^{\frac{b}{dx+c}} c^4}{4d} + \frac{d^2 b \ln(F) F^a F^{\frac{b}{dx+c}} x^3}{12} +$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c))*(d*x+c)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/4*d^3*F^a*F^(b/(d*x+c))*x^4+d^2*F^a*F^(b/(d*x+c))*c*x^3+3/2*d*F^a*F^(b/(d
*x+c))*c^2*x^2+F^a*F^(b/(d*x+c))*c^3*x+1/4/d*F^a*F^(b/(d*x+c))*c^4+1/12*d^2
*b*ln(F)*F^a*F^(b/(d*x+c))*x^3+1/4*d*b*ln(F)*F^a*F^(b/(d*x+c))*c*x^2+1/4*b*
ln(F)*F^a*F^(b/(d*x+c))*c^2*x+1/12/d*b*ln(F)*F^a*F^(b/(d*x+c))*c^3+1/24*d*b
^2*ln(F)^2*F^a*F^(b/(d*x+c))*x^2+1/12*b^2*ln(F)^2*F^a*F^(b/(d*x+c))*c*x+1/2
4/d*b^2*ln(F)^2*F^a*F^(b/(d*x+c))*c^2+1/24*b^3*ln(F)^3*F^a*F^(b/(d*x+c))*x+
1/24/d*b^3*ln(F)^3*F^a*F^(b/(d*x+c))*c+1/24/d*b^4*ln(F)^4*F^a*Ei(1,-b*ln(F)
/(d*x+c))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] 1/24*(6*F^a*d^3*x^4 + 2*(F^a*b*d^2*log(F) + 12*F^a*c*d^2)*x^3 + (F^a*b^2*d*
log(F)^2 + 6*F^a*b*c*d*log(F) + 36*F^a*c^2*d)*x^2 + (F^a*b^3*log(F)^3 + 2*F
^a*b^2*c*log(F)^2 + 6*F^a*b*c^2*log(F) + 24*F^a*c^3)*x)*F^(b/(d*x + c)) + i
ntegrate(1/24*(F^a*b^4*d*x*log(F)^4 - F^a*b^3*c^2*log(F)^3 - 2*F^a*b^2*c^3*
log(F)^2 - 6*F^a*b*c^4*log(F))*F^(b/(d*x + c))/(d^2*x^2 + 2*c*d*x + c^2), x
)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 175 vs. $2(28) = 56$.
time = 0.09, size = 175, normalized size = 6.25

$$-\frac{F^a b^4 \mathrm{Ei}\left(\frac{b\log(F)}{dx+c}\right) \log\left(F\right)^4 - \left(6\, d^4 x^4 + 24\, c d^3 x^3 + 36\, c^2 d^2 x^2 + 24\, c^3 dx + 6\, c^4 + \left(b^3 dx + b^3 c\right) \log\left(F\right)^3 + \left(b^2 d^2 x^2 + 2\, b^2 c dx + b^2 c^2\right) \log\left(F\right)^2 + 2\left(b d^3 x^3 + 3\, b c d^2 x^2 + 3\, b c^2 dx + b c^3\right) \log\left(F\right)\right) F^{\frac{adx+ac+b}{dx+c}}}{24\, d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] -1/24*(F^a*b^4*Ei(b*log(F)/(d*x + c))*log(F)^4 - (6*d^4*x^4 + 24*c*d^3*x^3
+ 36*c^2*d^2*x^2 + 24*c^3*d*x + 6*c^4 + (b^3*d*x + b^3*c)*log(F)^3 + (b^2*d
^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(F)^2 + 2*(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3
*b*c^2*d*x + b*c^3)*log(F))*F^((a*d*x + a*c + b)/(d*x + c)))/d
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{c+dx}}(c+dx)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))*(d*x+c)**3,x)
```

```
[Out] Integral(F**(a + b/(c + d*x))*(c + d*x)**3, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c)^3,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^3*F^(a + b/(d*x + c)), x)
```

Mupad [B]
time = 3.70, size = 148, normalized size = 5.29

$$\frac{F^a\,F^{\frac{b}{c+d\,x}}\,{\left(c+d\,x\right)}^4}{4\,d}+\frac{F^a\,b^4\,{\ln\left(F\right)}^4\,\mathrm{expint}\left(-\frac{b\,\ln\left(F\right)}{c+d\,x}\right)}{24\,d}+\frac{F^a\,F^{\frac{b}{c+d\,x}}\,b^2\,{\ln\left(F\right)}^2\,{\left(c+d\,x\right)}^2}{24\,d}+\frac{F^a\,F^{\frac{b}{c+d\,x}}\,b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^3}{12\,d}+\frac{F^a\,F^{\frac{b}{c+d\,x}}\,b^3\,{\ln\left(F\right)}^3\,\left(c+d\,x\right)}{24\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))*(c + d*x)^3,x)
```

```
[Out] (F^a*F^(b/(c + d*x))*(c + d*x)^4)/(4*d) + (F^a*b^4*log(F)^4*expint(-(b*log(
F))/(c + d*x)))/(24*d) + (F^a*F^(b/(c + d*x))*b^2*log(F)^2*(c + d*x)^2)/(24
*d) + (F^a*F^(b/(c + d*x))*b*log(F)*(c + d*x)^3)/(12*d) + (F^a*F^(b/(c + d*
x))*b^3*log(F)^3*(c + d*x))/(24*d)
```

3.304 $\int F^{a+\frac{b}{c+dx}}(c+dx)^2\,dx$

Optimal. Leaf size=119

$$\frac{F^{a+\frac{b}{c+dx}}(c+dx)^3}{3d}+\frac{bF^{a+\frac{b}{c+dx}}(c+dx)^2\log(F)}{6d}+\frac{b^2F^{a+\frac{b}{c+dx}}(c+dx)\log^2(F)}{6d}-\frac{b^3F^a\mathrm{Ei}\left(\frac{b\log(F)}{c+dx}\right)\log^3(F)}{6d}$$

```
[Out] 1/3*F^(a+b/(d*x+c))*(d*x+c)^3/d+1/6*b*F^(a+b/(d*x+c))*(d*x+c)^2*ln(F)/d+1/6
*b^2*F^(a+b/(d*x+c))*(d*x+c)*ln(F)^2/d-1/6*b^3*F^a*Ei(b*ln(F)/(d*x+c))*ln(F
)^3/d
```

Rubi [A]
time = 0.09, antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {2245, 2237, 2241}

$$-\frac{b^3F^a\log^3(F)\mathrm{Ei}\left(\frac{b\log(F)}{c+dx}\right)}{6d}+\frac{b^2\log^2(F)(c+dx)F^{a+\frac{b}{c+dx}}}{6d}+\frac{(c+dx)^3F^{a+\frac{b}{c+dx}}}{3d}+\frac{b\log(F)(c+dx)^2F^{a+\frac{b}{c+dx}}}{6d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))*(c + d*x)^2,x]
```

```
[Out] (F^(a + b/(c + d*x))*(c + d*x)^3)/(3*d) + (b*F^(a + b/(c + d*x))*(c + d*x)^
2*Log[F])/(6*d) + (b^2*F^(a + b/(c + d*x))*(c + d*x)*Log[F]^2)/(6*d) - (b^3
*F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)]*Log[F]^3)/(6*d)
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
```

```
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int F^{a+\frac{b}{c+dx}}(c+dx)^2\,dx=\frac{F^{a+\frac{b}{c+dx}}(c+dx)^3}{3d}+\frac{1}{3}(b\log(F))\int F^{a+\frac{b}{c+dx}}(c+dx)\,dx$$
$$=\frac{F^{a+\frac{b}{c+dx}}(c+dx)^3}{3d}+\frac{bF^{a+\frac{b}{c+dx}}(c+dx)^2\log(F)}{6d}+\frac{1}{6}\left(b^2\log^2(F)\right)\int F^{a+\frac{b}{c+dx}}\,dx$$
$$=\frac{F^{a+\frac{b}{c+dx}}(c+dx)^3}{3d}+\frac{bF^{a+\frac{b}{c+dx}}(c+dx)^2\log(F)}{6d}+\frac{b^2F^{a+\frac{b}{c+dx}}(c+dx)\log^2(F)}{6d}+\frac{1}{6}(\ldots$$
$$=\frac{F^{a+\frac{b}{c+dx}}(c+dx)^3}{3d}+\frac{bF^{a+\frac{b}{c+dx}}(c+dx)^2\log(F)}{6d}+\frac{b^2F^{a+\frac{b}{c+dx}}(c+dx)\log^2(F)}{6d}-\frac{b^3\ldots}{}$$

Mathematica [A]
time = 0.05, size = 76, normalized size = 0.64

$$\frac{F^a\left(-b^3\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)\log^3(F)+F^{\frac{b}{c+dx}}(c+dx)\left(2(c+dx)^2+b(c+dx)\log(F)+b^2\log^2(F)\right)\right)}{6d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))*(c + d*x)^2,x]
```

```
[Out] (F^a*(-(b^3*ExpIntegralEi[(b*Log[F])/(c + d*x)]*Log[F]^3) + F^(b/(c + d*x))
*(c + d*x)*(2*(c + d*x)^2 + b*(c + d*x)*Log[F] + b^2*Log[F]^2)))/(6*d)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 233 vs. $2(111) = 222$.
time = 0.10, size = 234, normalized size = 1.97

method	result
risch	$\frac{d^2F^aF^{\frac{b}{dx+c}}x^3}{3}+dF^aF^{\frac{b}{dx+c}}cx^2+F^aF^{\frac{b}{dx+c}}c^2x+\frac{F^aF^{\frac{b}{dx+c}}c^3}{3d}+\frac{db\ln(F)F^aF^{\frac{b}{dx+c}}x^2}{6}+\frac{b\ln(F)F^aF^{\frac{b}{dx+c}}cx}{3}+\ldots$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c))*(d*x+c)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*d^2*F^a*F^(b/(d*x+c))*x^3+d*F^a*F^(b/(d*x+c))*c*x^2+F^a*F^(b/(d*x+c))*c
^2*x+1/3/d*F^a*F^(b/(d*x+c))*c^3+1/6*d*b*ln(F)*F^a*F^(b/(d*x+c))*x^2+1/3*b*
ln(F)*F^a*F^(b/(d*x+c))*c*x+1/6/d*b*ln(F)*F^a*F^(b/(d*x+c))*c^2+1/6*b^2*ln(
F)^2*F^a*F^(b/(d*x+c))*x+1/6/d*b^2*ln(F)^2*F^a*F^(b/(d*x+c))*c+1/6/d*b^3*ln
(F)^3*F^a*Ei(1,-b*ln(F)/(d*x+c))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c)^2,x, algorithm="maxima")
```

```
[Out] 1/6*(2*F^a*d^2*x^3 + (F^a*b*d*log(F) + 6*F^a*c*d)*x^2 + (F^a*b^2*log(F)^2 +
 2*F^a*b*c*log(F) + 6*F^a*c^2)*x)*F^(b/(d*x + c)) + integrate(1/6*(F^a*b^3*
d*x*log(F)^3 - F^a*b^2*c^2*log(F)^2 - 2*F^a*b*c^3*log(F))*F^(b/(d*x + c))/(
d^2*x^2 + 2*c*d*x + c^2), x)
```

Fricas [A]
time = 0.36, size = 120, normalized size = 1.01

$$-\frac{F^{a}b^{3}\mathrm{Ei}\left(\frac{b\log\left(F\right)}{dx+c}\right)\log\left(F\right)^{3}-\left(2\,d^{3}x^{3}+6\,cd^{2}x^{2}+6\,c^{2}dx+2\,c^{3}+\left(b^{2}dx+b^{2}c\right)\log\left(F\right)^{2}+\left(bd^{2}x^{2}+2\,bcdx+bc^{2}\right)\log\left(F\right)\right)F^{\frac{adx+ac+b}{dx+c}}}{6\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] -1/6*(F^a*b^3*Ei(b*log(F)/(d*x + c))*log(F)^3 - (2*d^3*x^3 + 6*c*d^2*x^2 +
6*c^2*d*x + 2*c^3 + (b^2*d*x + b^2*c)*log(F)^2 + (b*d^2*x^2 + 2*b*c*d*x + b
*c^2)*log(F))*F^((a*d*x + a*c + b)/(d*x + c)))/d
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{c+dx}}\left(c+dx\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))*(d*x+c)**2,x)
```

```
[Out] Integral(F**(a + b/(c + d*x))*(c + d*x)**2, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c)^2,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^2*F^(a + b/(d*x + c)), x)
```

Mupad [B]
time = 3.88, size = 89, normalized size = 0.75

$$\frac{F^a\,b^3\ln\left(F\right)^3\left(\frac{\mathrm{expint}\left(-\frac{b\,\ln(F)}{c+d\,x}\right)}{6}+F^{\frac{b}{c+d\,x}}\,\left(\frac{c+d\,x}{6\,b\,\ln(F)}+\frac{{(c+d\,x)}^2}{6\,b^2\,{\ln(F)}^2}+\frac{{(c+d\,x)}^3}{3\,b^3\,{\ln(F)}^3}\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))*(c + d*x)^2,x)
```

```
[Out] (F^a*b^3*log(F)^3*(expint(-(b*log(F))/(c + d*x))/6 + F^(b/(c + d*x))*((c +
d*x)/(6*b*log(F)) + (c + d*x)^2/(6*b^2*log(F)^2) + (c + d*x)^3/(3*b^3*log(F
)^3))))/d
```

3.305 $\int F^{a+\frac{b}{c+dx}}(c+dx)\,dx$

Optimal. Leaf size=85

$$\frac{F^{a+\frac{b}{c+dx}}(c+dx)^2}{2d}+\frac{bF^{a+\frac{b}{c+dx}}(c+dx)\log(F)}{2d}-\frac{b^2F^a\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)\log^2(F)}{2d}$$

```
[Out] 1/2*F^(a+b/(d*x+c))*(d*x+c)^2/d+1/2*b*F^(a+b/(d*x+c))*(d*x+c)*ln(F)/d-1/2*b
^2*F^a*Ei(b*ln(F)/(d*x+c))*ln(F)^2/d
```

Rubi [A]
time = 0.06, antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.158$, Rules used = {2245, 2237, 2241}

$$-\frac{b^2F^a\log^2(F)\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)}{2d}+\frac{(c+dx)^2F^{a+\frac{b}{c+dx}}}{2d}+\frac{b\log(F)(c+dx)F^{a+\frac{b}{c+dx}}}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))*(c + d*x),x]
```

```
[Out] (F^(a + b/(c + d*x))*(c + d*x)^2)/(2*d) + (b*F^(a + b/(c + d*x))*(c + d*x)*
Log[F])/(2*d) - (b^2*F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)]*Log[F]^2)/(2*d
)
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
```

```
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int F^{a+\frac{b}{c+dx}}(c+dx)\,dx &= \frac{F^{a+\frac{b}{c+dx}}(c+dx)^2}{2d}+\frac{1}{2}(b\log(F))\int F^{a+\frac{b}{c+dx}}\,dx\\ &= \frac{F^{a+\frac{b}{c+dx}}(c+dx)^2}{2d}+\frac{bF^{a+\frac{b}{c+dx}}(c+dx)\log(F)}{2d}+\frac{1}{2}\left(b^2\log^2(F)\right)\int\frac{F^{a+\frac{b}{c+dx}}}{c+dx}\,dx\\ &= \frac{F^{a+\frac{b}{c+dx}}(c+dx)^2}{2d}+\frac{bF^{a+\frac{b}{c+dx}}(c+dx)\log(F)}{2d}-\frac{b^2F^a\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)\log^2(F)}{2d}\end{aligned}$$

Mathematica [**A**]
time = 0.04, size = 58, normalized size = 0.68

$$\frac{F^a\left(-b^2\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)\log^2(F)+F^{\frac{b}{c+dx}}(c+dx)(c+dx+b\log(F))\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))*(c + d*x),x]
[Out] (F^a*(-(b^2*ExpIntegralEi[(b*Log[F])/(c + d*x)]*Log[F]^2) + F^(b/(c + d*x))
*(c + d*x)*(c + d*x + b*Log[F])))/(2*d)
```

Maple [**A**]
time = 0.07, size = 133, normalized size = 1.56

method	result
risch	$\frac{d\,F^a F^{\frac{b}{dx+c}}x^2}{2}+F^a F^{\frac{b}{dx+c}}cx+\frac{F^a F^{\frac{b}{dx+c}}c^2}{2d}+\frac{b\ln(F)F^a F^{\frac{b}{dx+c}}x}{2}+\frac{b\ln(F)F^a F^{\frac{b}{dx+c}}c}{2d}+\frac{b^2\ln(F)^2F^a\,\text{expIntegral}\left(1,-\frac{b\,l}{d}\right.}{2d}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c))*(d*x+c),x,method=_RETURNVERBOSE)
[Out] 1/2*d*F^a*F^(b/(d*x+c))*x^2+F^a*F^(b/(d*x+c))*c*x+1/2/d*F^a*F^(b/(d*x+c))*c
^2+1/2*b*ln(F)*F^a*F^(b/(d*x+c))*x+1/2/d*b*ln(F)*F^a*F^(b/(d*x+c))*c+1/2/d*
b^2*ln(F)^2*F^a*Ei(1,-b*ln(F)/(d*x+c))
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c),x, algorithm="maxima")
```

```
[Out] 1/2*(F^a*d*x^2 + (F^a*b*log(F) + 2*F^a*c)*x)*F^(b/(d*x + c)) + integrate(1/
2*(F^a*b^2*d*x*log(F)^2 - F^a*b*c^2*log(F))*F^(b/(d*x + c))/(d^2*x^2 + 2*c*
d*x + c^2), x)
```

Fricas [A]
time = 0.38, size = 77, normalized size = 0.91

$$-\frac{F^a b^2 \mathrm{Ei}\left(\frac{b\log(F)}{dx+c}\right)\log(F)^2 - (d^2x^2 + 2\,cdx + c^2 + (bdx + bc)\log(F))F^{\frac{adx+ac+b}{dx+c}}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c),x, algorithm="fricas")
```

```
[Out] -1/2*(F^a*b^2*Ei(b*log(F)/(d*x + c))*log(F)^2 - (d^2*x^2 + 2*c*d*x + c^2 +
(b*d*x + b*c)*log(F))*F^((a*d*x + a*c + b)/(d*x + c)))/d
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{c+dx}}(c+dx)\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))*(d*x+c),x)
```

```
[Out] Integral(F**(a + b/(c + d*x))*(c + d*x), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)*F^(a + b/(d*x + c)), x)
```

Mupad [B]
time = 6.11, size = 82, normalized size = 0.96

$$\frac{F^a\,F^{\frac{b}{c+d\,x}}\,{\left(c+d\,x\right)}^2}{2\,d}+\frac{F^a\,b^2\,{\ln\left(F\right)}^2\,\mathrm{expint}\left(-\frac{b\,\ln\left(F\right)}{c+d\,x}\right)}{2\,d}+\frac{F^a\,F^{\frac{b}{c+d\,x}}\,b\,\ln\left(F\right)\,\left(c+d\,x\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))*(c + d*x),x)
```

```
[Out] (F^a*F^(b/(c + d*x))*(c + d*x)^2)/(2*d) + (F^a*b^2*log(F)^2*expint(-(b*log(
F))/(c + d*x)))/(2*d) + (F^a*F^(b/(c + d*x))*b*log(F)*(c + d*x))/(2*d)
```

3.306 $\int F^{a+\frac{b}{c+dx}}\,dx$

Optimal. Leaf size=46

$$\frac{F^{a+\frac{b}{c+dx}}(c+dx)}{d}-\frac{bF^a\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)\log(F)}{d}$$

[Out] F^(a+b/(d*x+c))*(d*x+c)/d-b*F^a*Ei(b*ln(F)/(d*x+c))*ln(F)/d

Rubi [A]
time = 0.03, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2237, 2241}

$$\frac{(c+dx)F^{a+\frac{b}{c+dx}}}{d}-\frac{bF^a\log(F)\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

[In] Int[F^(a + b/(c + d*x)),x]

[Out] (F^(a + b/(c + d*x))*(c + d*x))/d - (b*F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)]*Log[F])/d

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\begin{aligned}\int F^{a+\frac{b}{c+dx}}\,dx&=\frac{F^{a+\frac{b}{c+dx}}(c+dx)}{d}+(b\log(F))\int\frac{F^{a+\frac{b}{c+dx}}}{c+dx}\,dx\\&=\frac{F^{a+\frac{b}{c+dx}}(c+dx)}{d}-\frac{bF^a\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)\log(F)}{d}\end{aligned}$$

Mathematica [A]
time = 0.02, size = 42, normalized size = 0.91

$$\frac{F^a\left(F^{\frac{b}{c+dx}}(c+dx)-b\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)\log(F)\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)),x]
```

```
[Out] (F^a*(F^(b/(c + d*x))*(c + d*x) - b*ExpIntegralEi[(b*Log[F])/(c + d*x)]*Log
[F]))/d
```

Maple [A]
time = 0.08, size = 61, normalized size = 1.33

method	result	size
risch	$F^aF^{\frac{b}{dx+c}}x+\frac{F^aF^{\frac{b}{dx+c}}c}{d}+\frac{b\ln(F)F^a\,\text{expIntegral}\left(1,-\frac{b\ln(F)}{dx+c}\right)}{d}$	61

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)),x,method=_RETURNVERBOSE)
```

```
[Out] F^a*F^(b/(d*x+c))*x+1/d*F^a*F^(b/(d*x+c))*c+b/d*ln(F)*F^a*Ei(1,-b*ln(F)/(d*
x+c))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)),x, algorithm="maxima")
```

```
[Out] F^a*b*d*integrate(F^(b/(d*x + c))*x/(d^2*x^2 + 2*c*d*x + c^2), x)*log(F) +
F^a*F^(b/(d*x + c))*x
```

Fricas [A]
time = 0.36, size = 51, normalized size = 1.11

$$-\frac{F^a b\text{Ei}\left(\frac{b\log(F)}{dx+c}\right)\log(F)-(dx+c)F^{\frac{adx+ac+b}{dx+c}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)),x, algorithm="fricas")
```

```
[Out] -(F^a*b*Ei(b*log(F)/(d*x + c))*log(F) - (d*x + c)*F^((a*d*x + a*c + b)/(d*x
 + c)))/d
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{c+dx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)),x)
```

```
[Out] Integral(F**(a + b/(c + d*x)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)), x)
```

Mupad [B]
time = 4.40, size = 47, normalized size = 1.02

$$\frac{F^a\,F^{\frac{b}{c+d\,x}}\,\left(c+d\,x\right)}{d}+\frac{F^a\,b\,\ln\left(F\right)\,\mathrm{expint}\left(-\frac{b\,\ln\left(F\right)}{c+d\,x}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)),x)
```

```
[Out] (F^a*F^(b/(c + d*x))*(c + d*x))/d + (F^a*b*log(F)*expint(-(b*log(F))/(c + d
*x)))/d
```

3.307 $\int \frac{F^{a+\frac{b}{c+dx}}}{c+dx}\,dx$

Optimal. Leaf size=20

$$-\frac{F^a \text{Ei}\left(\frac{b\log(F)}{c+dx}\right)}{d}$$

```
[Out] -F^a*Ei(b*ln(F)/(d*x+c))/d
```

Rubi [A]
time = 0.03, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2241}

$$-\frac{F^a \text{Ei}\left(\frac{b\log(F)}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))/(c + d*x),x]
```

```
[Out] -((F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)])/d)
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{c+dx}}}{c+dx}\,dx = -\frac{F^a \text{Ei}\left(\frac{b\log(F)}{c+dx}\right)}{d}$$

Mathematica [A]
time = 0.00, size = 20, normalized size = 1.00

$$-\frac{F^a \text{Ei}\left(\frac{b\log(F)}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))/(c + d*x),x]
```

[Out] -((F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)])/d)

Maple [A]
time = 0.09, size = 22, normalized size = 1.10

method	result	size
risch	$\frac{F^a \operatorname{expIntegral}\left(1,-\frac{b\ln(F)}{dx+c}\right)}{d}$	22

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a+b/(d*x+c))/(d*x+c),x,method=_RETURNVERBOSE)

[Out] 1/d*F^a*Ei(1,-b*ln(F)/(d*x+c))

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c))/(d*x+c),x, algorithm="maxima")

[Out] integrate(F^(a + b/(d*x + c))/(d*x + c), x)

Fricas [A]
time = 0.36, size = 20, normalized size = 1.00

$$-\frac{F^a \operatorname{Ei}\left(\frac{b\log(F)}{dx+c}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c))/(d*x+c),x, algorithm="fricas")

[Out] -F^a*Ei(b*log(F)/(d*x + c))/d

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{c+dx}}}{c+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F**(a+b/(d*x+c))/(d*x+c),x)

[Out] Integral(F**(a + b/(c + d*x))/(c + d*x), x)

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c),x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(d*x + c), x)
```

Mupad [B]
time = 3.76, size = 20, normalized size = 1.00

$$-\frac{F^a\,\mathrm{ei}\left(\frac{b\,\ln\left(F\right)}{c+d\,x}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))/(c + d*x),x)
```

```
[Out] -(F^a*ei((b*log(F))/(c + d*x)))/d
```

3.308 $\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^2} dx$

Optimal. Leaf size=25

$$-\frac{F^{a+\frac{b}{c+dx}}}{bd\log(F)}$$

```
[Out] -F^(a+b/(d*x+c))/b/d/ln(F)
```

Rubi [A]
time = 0.03, antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = $\{2240\}$

$$-\frac{F^{a+\frac{b}{c+dx}}}{bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))/(c + d*x)^2,x]
```

```
[Out] -(F^(a + b/(c + d*x))/(b*d*Log[F]))
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^2} dx = -\frac{F^{a+\frac{b}{c+dx}}}{bd\log(F)}$$

Mathematica [A]
time = 0.01, size = 25, normalized size = 1.00

$$-\frac{F^{a+\frac{b}{c+dx}}}{bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))/(c + d*x)^2,x]
```

[Out] -(F^(a + b/(c + d*x))/(b*d*Log[F]))

Maple [A]
time = 0.06, size = 26, normalized size = 1.04

method	result	size
derivativedivides	$-\frac{F^{a+\frac{b}{dx+c}}}{bd\ln(F)}$	26
default	$-\frac{F^{a+\frac{b}{dx+c}}}{bd\ln(F)}$	26
risch	$-\frac{F^{\frac{xad+ca+b}{dx+c}}}{bd\ln(F)}$	32
norman	$\frac{-\frac{x\,e^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{b\ln(F)}-\frac{c\,e^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{\ln(F)bd}}{dx+c}$	63

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a+b/(d*x+c))/(d*x+c)^2,x,method=_RETURNVERBOSE)

[Out] -F^(a+b/(d*x+c))/b/d/ln(F)

Maxima [A]
time = 0.28, size = 25, normalized size = 1.00

$$-\frac{F^{a+\frac{b}{dx+c}}}{bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^2,x, algorithm="maxima")

[Out] -F^(a + b/(d*x + c))/(b*d*log(F))

Fricas [A]
time = 0.39, size = 31, normalized size = 1.24

$$-\frac{F^{\frac{adx+ac+b}{dx+c}}}{bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^2,x, algorithm="fricas")

[Out] -F^((a*d*x + a*c + b)/(d*x + c))/(b*d*log(F))

Sympy [A]
time = 0.12, size = 34, normalized size = 1.36

$$\begin{cases} -\frac{F^{a+\frac{b}{c+dx}}}{bd\log(F)} & \text{for } bd\log(F) \neq 0 \\ -\frac{1}{cd+d^2x} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))/(d*x+c)**2,x)
```

```
[Out] Piecewise((-F**(a + b/(c + d*x))/(b*d*log(F)), Ne(b*d*log(F), 0)), (-1/(c*d
 + d**2*x), True))
```

Giac [A]
time = 2.75, size = 31, normalized size = 1.24

$$-\frac{F^{\frac{adx+ac+b}{dx+c}}}{bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^2,x, algorithm="giac")
```

```
[Out] -F^((a*d*x + a*c + b)/(d*x + c))/(b*d*log(F))
```

Mupad [B]
time = 5.04, size = 25, normalized size = 1.00

$$-\frac{F^{a+\frac{b}{c+d\,x}}}{b\,d\,\ln\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))/(c + d*x)^2,x)
```

```
[Out] -F^(a + b/(c + d*x))/(b*d*log(F))
```

3.309 $\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^3} \, dx$

Optimal. Leaf size=57

$$\frac{F^{a+\frac{b}{c+dx}}}{b^2 d \log^2(F)} - \frac{F^{a+\frac{b}{c+dx}}}{bd(c+dx)\log(F)}$$

```
[Out] F^(a+b/(d*x+c))/b^2/d/ln(F)^2-F^(a+b/(d*x+c))/b/d/(d*x+c)/ln(F)
```

Rubi [A]
time = 0.06, antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2243, 2240}

$$\frac{F^{a+\frac{b}{c+dx}}}{b^2 d \log^2(F)} - \frac{F^{a+\frac{b}{c+dx}}}{bd\log(F)(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))/(c + d*x)^3,x]
```

```
[Out] F^(a + b/(c + d*x))/(b^2*d*Log[F]^2) - F^(a + b/(c + d*x))/(b*d*(c + d*x)*L
og[F])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^3}\,dx = -\frac{F^{a+\frac{b}{c+dx}}}{bd(c+dx)\log(F)} - \frac{\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^2}\,dx}{b\log(F)}$$
$$= \frac{F^{a+\frac{b}{c+dx}}}{b^2 d\log^2(F)} - \frac{F^{a+\frac{b}{c+dx}}}{bd(c+dx)\log(F)}$$

Mathematica [A]
time = 0.01, size = 41, normalized size = 0.72

$$\frac{F^{a+\frac{b}{c+dx}}(c+dx-b\log(F))}{b^2 d(c+dx)\log^2(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))/(c + d*x)^3,x]
[Out] (F^(a + b/(c + d*x))*(c + d*x - b*Log[F]))/(b^2*d*(c + d*x)*Log[F]^2)
```

Maple [A]
time = 0.06, size = 51, normalized size = 0.89

method	result	size
risch	$-\frac{(b\ln(F)-dx-c)F^{\frac{xad+ca+b}{dx+c}}}{d\ln(F)^2 b^2(dx+c)}$	51
norman	$\frac{\frac{d\,x^2 \mathrm{e}^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{\ln(F)^2 b^2}-\frac{(b\ln(F)-2c)x\,\mathrm{e}^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{\ln(F)^2 b^2}-\frac{c(b\ln(F)-c)\mathrm{e}^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{d\ln(F)^2 b^2}}{(dx+c)^2}$	106

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c))/(d*x+c)^3,x,method=_RETURNVERBOSE)
[Out] -(b*ln(F)-d*x-c)/d/ln(F)^2/b^2/(d*x+c)*F^((a*d*x+a*c+b)/(d*x+c))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^3,x, algorithm="maxima")
[Out] integrate(F^(a + b/(d*x + c))/(d*x + c)^3, x)
```

Fricas [A]
time = 0.38, size = 51, normalized size = 0.89

$$\frac{(dx - b\log(F) + c)F^{\frac{adx+ac+b}{dx+c}}}{(b^2d^2x + b^2cd)\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] (d*x - b*log(F) + c)*F^((a*d*x + a*c + b)/(d*x + c))/((b^2*d^2*x + b^2*c*d)
*log(F)^2)
```

Sympy [A]
time = 0.08, size = 44, normalized size = 0.77

$$\frac{F^{a+\frac{b}{c+dx}}(-b\log(F) + c + dx)}{b^2cd\log(F)^2 + b^2d^2x\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))/(d*x+c)**3,x)
```

```
[Out] F**(a + b/(c + d*x))*(-b*log(F) + c + d*x)/(b**2*c*d*log(F)**2 + b**2*d**2*
x*log(F)**2)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^3,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(d*x + c)^3, x)
```

Mupad [B]
time = 6.23, size = 41, normalized size = 0.72

$$\frac{F^{a+\frac{b}{c+d\,x}}\,(c + d\,x - b\,\ln(F))}{b^2\,d\ln(F)^2\,(c + d\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))/(c + d*x)^3,x)
```

```
[Out] (F^(a + b/(c + d*x))*(c + d*x - b*log(F)))/(b^2*d*log(F)^2*(c + d*x))
```

3.310 $\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^4} dx$

Optimal. Leaf size=90

$$-\frac{2F^{a+\frac{b}{c+dx}}}{b^3 d \log^3(F)}+\frac{2F^{a+\frac{b}{c+dx}}}{b^2 d(c+dx)\log^2(F)}-\frac{F^{a+\frac{b}{c+dx}}}{bd(c+dx)^2\log(F)}$$

```
[Out] -2*F^(a+b/(d*x+c))/b^3/d/ln(F)^3+2*F^(a+b/(d*x+c))/b^2/d/(d*x+c)/ln(F)^2-F^
(a+b/(d*x+c))/b/d/(d*x+c)^2/ln(F)
```

Rubi [A]
time = 0.09, antiderivative size = 90, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2243, 2240}

$$-\frac{2F^{a+\frac{b}{c+dx}}}{b^3 d \log^3(F)}+\frac{2F^{a+\frac{b}{c+dx}}}{b^2 d \log^2(F)(c+dx)}-\frac{F^{a+\frac{b}{c+dx}}}{bd\log(F)(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))/(c + d*x)^4,x]
```

```
[Out] (-2*F^(a + b/(c + d*x)))/(b^3*d*Log[F]^3) + (2*F^(a + b/(c + d*x)))/(b^2*d*
(c + d*x)*Log[F]^2) - F^(a + b/(c + d*x))/(b*d*(c + d*x)^2*Log[F])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^4}\,dx = -\frac{F^{a+\frac{b}{c+dx}}}{bd(c+dx)^2\log(F)} - \frac{2\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^3}\,dx}{b\log(F)}$$
$$= \frac{2F^{a+\frac{b}{c+dx}}}{b^2d(c+dx)\log^2(F)} - \frac{F^{a+\frac{b}{c+dx}}}{bd(c+dx)^2\log(F)} + \frac{2\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^2}\,dx}{b^2\log^2(F)}$$
$$= -\frac{2F^{a+\frac{b}{c+dx}}}{b^3d\log^3(F)} + \frac{2F^{a+\frac{b}{c+dx}}}{b^2d(c+dx)\log^2(F)} - \frac{F^{a+\frac{b}{c+dx}}}{bd(c+dx)^2\log(F)}$$

Mathematica [A]
time = 0.02, size = 60, normalized size = 0.67

$$-\frac{F^{a+\frac{b}{c+dx}}\left(2(c+dx)^2-2b(c+dx)\log(F)+b^2\log^2(F)\right)}{b^3d(c+dx)^2\log^3(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))/(c + d*x)^4,x]
```

```
[Out] -((F^(a + b/(c + d*x))*(2*(c + d*x)^2 - 2*b*(c + d*x)*Log[F] + b^2*Log[F]^2
))/(b^3*d*(c + d*x)^2*Log[F]^3))
```

Maple [A]
time = 0.07, size = 79, normalized size = 0.88

method	result
risch	$-\frac{\left(\ln(F)^2b^2-2bdx\ln(F)+2d^2x^2-2cb\ln(F)+4cdx+2c^2\right)F^{\frac{xad+ca+b}{dx+c}}}{b^3\ln(F)^3d(dx+c)^2}$
norman	$\frac{-\frac{2d^2x^3\mathrm{e}^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{\ln(F)^3b^3}-\frac{\left(\ln(F)^2b^2-4cb\ln(F)+6c^2\right)x\,\mathrm{e}^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{\ln(F)^3b^3}+\frac{2d(b\ln(F)-3c)x^2\mathrm{e}^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{\ln(F)^3b^3}-\frac{\left(\ln(F)^2b^2-2cb\ln(F)+2c^2\right)}{b^3\ln(F)^3}}{(dx+c)^3}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c))/(d*x+c)^4,x,method=_RETURNVERBOSE)
```

```
[Out] -(ln(F)^2*b^2-2*b*d*x*ln(F)+2*d^2*x^2-2*c*b*ln(F)+4*c*d*x+2*c^2)/b^3/ln(F)^
3/d/(d*x+c)^2*F^((a*d*x+a*c+b)/(d*x+c))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^4,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(d*x + c)^4, x)
```

Fricas [A]
time = 0.39, size = 95, normalized size = 1.06

$$-\frac{\left(2\,d^{2}x^{2}+b^{2}\log\left(F\right)^{2}+4\,cdx+2\,c^{2}-2\,\left(bdx+bc\right)\log\left(F\right)\right)F^{\frac{adx+ac+b}{dx+c}}}{\left(b^{3}d^{3}x^{2}+2\,b^{3}cd^{2}x+b^{3}c^{2}d\right)\log\left(F\right)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] -(2*d^2*x^2 + b^2*log(F)^2 + 4*c*d*x + 2*c^2 - 2*(b*d*x + b*c)*log(F))*F^((
a*d*x + a*c + b)/(d*x + c))/((b^3*d^3*x^2 + 2*b^3*c*d^2*x + b^3*c^2*d)*log(
F)^3)
```

Sympy [A]
time = 0.10, size = 102, normalized size = 1.13

$$\frac{F^{a+\frac{b}{c+dx}}\left(-b^{2}\log\left(F\right)^{2}+2bc\log\left(F\right)+2bdx\log\left(F\right)-2c^{2}-4cdx-2d^{2}x^{2}\right)}{b^{3}c^{2}d\log\left(F\right)^{3}+2b^{3}cd^{2}x\log\left(F\right)^{3}+b^{3}d^{3}x^{2}\log\left(F\right)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))/(d*x+c)**4,x)
```

```
[Out] F**(a + b/(c + d*x))*(-b**2*log(F)**2 + 2*b*c*log(F) + 2*b*d*x*log(F) - 2*c
**2 - 4*c*d*x - 2*d**2*x**2)/(b**3*c**2*d*log(F)**3 + 2*b**3*c*d**2*x*log(F
)**3 + b**3*d**3*x**2*log(F)**3)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^4,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(d*x + c)^4, x)
```

Mupad [B]
time = 5.62, size = 104, normalized size = 1.16

$$-\frac{F^{a+\frac{b}{c+d\,x}}\,\left(\frac{b^2\,\ln\left(F\right)^2-2\,b\,c\,\ln\left(F\right)+2\,c^2}{b^3\,d^3\,\ln\left(F\right)^3}+\frac{2\,x^2}{b^3\,d\,\ln\left(F\right)^3}+\frac{2\,x\,\left(2\,c-b\,\ln\left(F\right)\right)}{b^3\,d^2\,\ln\left(F\right)^3}\right)}{x^2+\frac{c^2}{d^2}+\frac{2\,c\,x}{d}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))/(c + d*x)^4,x)
```

```
[Out] -(F^(a + b/(c + d*x))*((b^2*log(F)^2 + 2*c^2 - 2*b*c*log(F))/(b^3*d^3*log(F
)^3) + (2*x^2)/(b^3*d*log(F)^3) + (2*x*(2*c - b*log(F)))/(b^3*d^2*log(F)^3)
))/(x^2 + c^2/d^2 + (2*c*x)/d)
```

3.311 $\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^5} \, dx$

Optimal. Leaf size=122

$$\frac{6F^{a+\frac{b}{c+dx}}}{b^4d\log^4(F)}-\frac{6F^{a+\frac{b}{c+dx}}}{b^3d(c+dx)\log^3(F)}+\frac{3F^{a+\frac{b}{c+dx}}}{b^2d(c+dx)^2\log^2(F)}-\frac{F^{a+\frac{b}{c+dx}}}{bd(c+dx)^3\log(F)}$$

```
[Out] 6*F^(a+b/(d*x+c))/b^4/d/ln(F)^4-6*F^(a+b/(d*x+c))/b^3/d/(d*x+c)/ln(F)^3+3*F
^(a+b/(d*x+c))/b^2/d/(d*x+c)^2/ln(F)^2-F^(a+b/(d*x+c))/b/d/(d*x+c)^3/ln(F)
```

Rubi [A]
time = 0.13, antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2243, 2240}

$$\frac{6F^{a+\frac{b}{c+dx}}}{b^4d\log^4(F)}-\frac{6F^{a+\frac{b}{c+dx}}}{b^3d\log^3(F)(c+dx)}+\frac{3F^{a+\frac{b}{c+dx}}}{b^2d\log^2(F)(c+dx)^2}-\frac{F^{a+\frac{b}{c+dx}}}{bd\log(F)(c+dx)^3}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))/(c + d*x)^5,x]
```

```
[Out] (6*F^(a + b/(c + d*x)))/(b^4*d*Log[F]^4) - (6*F^(a + b/(c + d*x)))/(b^3*d*(
c + d*x)*Log[F]^3) + (3*F^(a + b/(c + d*x)))/(b^2*d*(c + d*x)^2*Log[F]^2) -
 F^(a + b/(c + d*x))/(b*d*(c + d*x)^3*Log[F])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^5}\,dx = -\frac{F^{a+\frac{b}{c+dx}}}{bd(c+dx)^3\log(F)} - \frac{3\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^4}\,dx}{b\log(F)}$$

$$= \frac{3F^{a+\frac{b}{c+dx}}}{b^2d(c+dx)^2\log^2(F)} - \frac{F^{a+\frac{b}{c+dx}}}{bd(c+dx)^3\log(F)} + \frac{6\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^3}\,dx}{b^2\log^2(F)}$$

$$= -\frac{6F^{a+\frac{b}{c+dx}}}{b^3d(c+dx)\log^3(F)} + \frac{3F^{a+\frac{b}{c+dx}}}{b^2d(c+dx)^2\log^2(F)} - \frac{F^{a+\frac{b}{c+dx}}}{bd(c+dx)^3\log(F)} - \frac{6\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^2}\,dx}{b^3\log^3(F)}$$

$$= \frac{6F^{a+\frac{b}{c+dx}}}{b^4d\log^4(F)} - \frac{6F^{a+\frac{b}{c+dx}}}{b^3d(c+dx)\log^3(F)} + \frac{3F^{a+\frac{b}{c+dx}}}{b^2d(c+dx)^2\log^2(F)} - \frac{F^{a+\frac{b}{c+dx}}}{bd(c+dx)^3\log(F)}$$

Mathematica [A]
time = 0.03, size = 76, normalized size = 0.62

$$\frac{F^{a+\frac{b}{c+dx}}\left(6(c+dx)^3-6b(c+dx)^2\log(F)+3b^2(c+dx)\log^2(F)-b^3\log^3(F)\right)}{b^4d(c+dx)^3\log^4(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))/(c + d*x)^5,x]
```

```
[Out] (F^(a + b/(c + d*x))*(6*(c + d*x)^3 - 6*b*(c + d*x)^2*Log[F] + 3*b^2*(c + d
*x)*Log[F]^2 - b^3*Log[F]^3))/(b^4*d*(c + d*x)^3*Log[F]^4)
```

Maple [A]
time = 0.07, size = 125, normalized size = 1.02

method	result
risch	$-\frac{\left(\ln(F)^3b^3-3\ln(F)^2b^2dx+6\ln(F)b\,d^2x^2-6d^3x^3-3\ln(F)^2b^2c+12\ln(F)bcdx-18c\,d^2x^2+6\ln(F)b\,c^2-18c^2dx-6c^3\right)F^{\frac{xad+ca+b}{dx+c}}}{b^4\ln(F)^4d(dx+c)^3}$
norman	$\frac{-\frac{\left(\ln(F)^3b^3-6\ln(F)^2b^2c+18\ln(F)b\,c^2-24c^3\right)x\,e^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{\ln(F)^4b^4}+\frac{6d^3x^4e^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{\ln(F)^4b^4}+\frac{3d\left(\ln(F)^2b^2-6cb\ln(F)+12c^2\right)x^2e^{\left(a+\frac{b}{dx+c}\right)\cdots}}{\ln(F)^4b^4}\cdots}{(dx+c)^4}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c))/(d*x+c)^5,x,method=_RETURNVERBOSE)
```

```
[Out] -(ln(F)^3*b^3-3*ln(F)^2*b^2*d*x+6*ln(F)*b*d^2*x^2-6*d^3*x^3-3*ln(F)^2*b^2*c
+12*ln(F)*b*c*d*x-18*c*d^2*x^2+6*ln(F)*b*c^2-18*c^2*d*x-6*c^3)/b^4/ln(F)^4/
d/(d*x+c)^3*F^((a*d*x+a*c+b)/(d*x+c))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^5,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(d*x + c)^5, x)
```

Fricas [A]
time = 0.38, size = 150, normalized size = 1.23

$$\frac{\left(6\,d^3x^3 - b^3\log\left(F\right)^3 + 18\,cd^2x^2 + 18\,c^2dx + 6\,c^3 + 3\,\left(b^2dx + b^2c\right)\log\left(F\right)^2 - 6\,\left(bd^2x^2 + 2\,bcdx + bc^2\right)\log\left(F\right)\right)F^{\frac{adx+ac+b}{dx+c}}}{\left(b^4d^4x^3 + 3\,b^4cd^3x^2 + 3\,b^4c^2d^2x + b^4c^3d\right)\log\left(F\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^5,x, algorithm="fricas")
```

```
[Out] (6*d^3*x^3 - b^3*log(F)^3 + 18*c*d^2*x^2 + 18*c^2*d*x + 6*c^3 + 3*(b^2*d*x
+ b^2*c)*log(F)^2 - 6*(b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F))*F^((a*d*x + a
*c + b)/(d*x + c))/((b^4*d^4*x^3 + 3*b^4*c*d^3*x^2 + 3*b^4*c^2*d^2*x + b^4*
c^3*d)*log(F)^4)
```

Sympy [A]
time = 0.12, size = 177, normalized size = 1.45

$$\frac{F^{a+\frac{b}{c+dx}}\left(-b^3\log\left(F\right)^3 + 3b^2c\log\left(F\right)^2 + 3b^2dx\log\left(F\right)^2 - 6bc^2\log\left(F\right) - 12bcdx\log\left(F\right) - 6bd^2x^2\log\left(F\right) + 6c^3 + 18c^2dx + 18cd^2x^2 + 6d^3x^3\right)}{b^4c^3d\log\left(F\right)^4 + 3b^4c^2d^2x\log\left(F\right)^4 + 3b^4cd^3x^2\log\left(F\right)^4 + b^4d^4x^3\log\left(F\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))/(d*x+c)**5,x)
```

```
[Out] F**(a + b/(c + d*x))*(-b**3*log(F)**3 + 3*b**2*c*log(F)**2 + 3*b**2*d*x*log
(F)**2 - 6*b*c**2*log(F) - 12*b*c*d*x*log(F) - 6*b*d**2*x**2*log(F) + 6*c**
3 + 18*c**2*d*x + 18*c*d**2*x**2 + 6*d**3*x**3)/(b**4*c**3*d*log(F)**4 + 3*
b**4*c**2*d**2*x*log(F)**4 + 3*b**4*c*d**3*x**2*log(F)**4 + b**4*d**4*x**3*
log(F)**4)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^5,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(d*x + c)^5, x)
```

Mupad [B]
time = 3.80, size = 161, normalized size = 1.32

$$\frac{F^{a+\frac{b}{c+d\,x}}\,\left(\frac{6\,x^3}{b^4\,d\ln(F)^4}-\frac{b^3\ln(F)^3-3\,b^2\,c\ln(F)^2+6\,b\,c^2\,\ln(F)-6\,c^3}{b^4\,d^4\ln(F)^4}+\frac{x^2\,(18\,c-6\,b\,\ln(F))}{b^4\,d^2\ln(F)^4}+\frac{3\,x\,\left(b^2\ln(F)^2-4\,b\,c\,\ln(F)+6\,c^2\right)}{b^4\,d^3\ln(F)^4}\right)}{x^3+\frac{c^3}{d^3}+\frac{3\,c\,x^2}{d}+\frac{3\,c^2\,x}{d^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))/(c + d*x)^5,x)
```

```
[Out] (F^(a + b/(c + d*x))*((6*x^3)/(b^4*d*log(F)^4) - (b^3*log(F)^3 - 6*c^3 + 6*
b*c^2*log(F) - 3*b^2*c*log(F)^2)/(b^4*d^4*log(F)^4) + (x^2*(18*c - 6*b*log(
F)))/(b^4*d^2*log(F)^4) + (3*x*(b^2*log(F)^2 + 6*c^2 - 4*b*c*log(F)))/(b^4*
d^3*log(F)^4)))/(x^3 + c^3/d^3 + (3*c*x^2)/d + (3*c^2*x)/d^2)
```

3.312 $\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^6} dx$

Optimal. Leaf size=92

$$-\frac{F^{a+\frac{b}{c+dx}}\left(24(c+dx)^4-24b(c+dx)^3\log(F)+12b^2(c+dx)^2\log^2(F)-4b^3(c+dx)\log^3(F)+b^4\log^4(F)\right)}{b^5d(c+dx)^4\log^5(F)}$$

```
[Out] -F^(a+b/(d*x+c))*(24*(d*x+c)^4-24*b*(d*x+c)^3*ln(F)+12*b^2*(d*x+c)^2*ln(F)^
2-4*b^3*(d*x+c)*ln(F)^3+b^4*ln(F)^4)/b^5/d/(d*x+c)^4/ln(F)^5
```

Rubi [A]
time = 0.06, antiderivative size = 92, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = $\{2249\}$

$$-\frac{F^{a+\frac{b}{c+dx}}\left(b^4\log^4(F)-4b^3\log^3(F)(c+dx)+12b^2\log^2(F)(c+dx)^2-24b\log(F)(c+dx)^3+24(c+dx)^4\right)}{b^5d\log^5(F)(c+dx)^4}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))/(c + d*x)^6,x]
```

```
[Out] -((F^(a + b/(c + d*x))*(24*(c + d*x)^4 - 24*b*(c + d*x)^3*Log[F] + 12*b^2*(
c + d*x)^2*Log[F]^2 - 4*b^3*(c + d*x)*Log[F]^3 + b^4*Log[F]^4))/(b^5*d*(c +
 d*x)^4*Log[F]^5))
```

Rule 2249

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> With[{p = Simplify[(m + 1)/n]}, Simp[(-F^a)*((f/d)^m/(d*n*
((-b)*Log[F])^p))*Simplify[FunctionExpand[Gamma[p, (-b)*(c + d*x)^n*Log[F]]
]], x] /; IGtQ[p, 0]] /; FreeQ[{F, a, b, c, d, e, f, m, n}, x] && EqQ[d*e -
 c*f, 0] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^6} dx = -\frac{F^a\Gamma\left(5,-\frac{b\log(F)}{c+dx}\right)}{b^5d\log^5(F)}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.01, size = 29, normalized size = 0.32

$$-\frac{F^a\Gamma\left(5,-\frac{b\log(F)}{c+dx}\right)}{b^5d\log^5(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))/(c + d*x)^6,x]
```

```
[Out] -((F^a*Gamma[5, -((b*Log[F])/(c + d*x))])/(b^5*d*Log[F]^5))
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 188 vs. $2(92) = 184$.
time = 0.08, size = 189, normalized size = 2.05

method	result
risch	$-\frac{\left(b^4 \ln(F)^4 - 4\ln(F)^3 b^3 dx + 12b^2 d^2 x^2 \ln(F)^2 - 24\ln(F) b\, d^3 x^3 + 24 d^4 x^4 - 4\ln(F)^3 b^3 c + 24\ln(F)^2 b^2 c d x - 72\ln(F) b c\, d^2 x^2 + 96 c\, d^3 x^3 +}{b^5 \ln(F)^5 d(dx+c)^4}$
norman	$\frac{-\frac{24 d^4 x^5 e^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{\ln(F)^5 b^5} - \frac{\left(b^4\ln(F)^4 - 8\ln(F)^3 b^3 c + 36\ln(F)^2 b^2 c^2 - 96\ln(F) b\, c^3 + 120 c^4\right) x\, e^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{\ln(F)^5 b^5} + \frac{4d\left(\ln(F)^3 b^3 - 9\ln(F)^2 b^2 c + 36}{\ln}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c))/(d*x+c)^6,x,method=_RETURNVERBOSE)
```

```
[Out] -(b^4*ln(F)^4-4*ln(F)^3*b^3*d*x+12*b^2*d^2*x^2*ln(F)^2-24*ln(F)*b*d^3*x^3+2
4*d^4*x^4-4*ln(F)^3*b^3*c+24*ln(F)^2*b^2*c*d*x-72*ln(F)*b*c*d^2*x^2+96*c*d^
3*x^3+12*ln(F)^2*b^2*c^2-72*ln(F)*b*c^2*d*x+144*c^2*d^2*x^2-24*ln(F)*b*c^3+
96*c^3*d*x+24*c^4)/b^5/ln(F)^5/d/(d*x+c)^4*F^((a*d*x+a*c+b)/(d*x+c))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^6,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(d*x + c)^6, x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 219 vs. $2(92) = 184$.
time = 0.35, size = 219, normalized size = 2.38

$$-\frac{\left(24\, d^4 x^4 + b^4 \log(F)^4 + 96\, c d^3 x^3 + 144\, c^2 d^2 x^2 + 96\, c^3 d x + 24\, c^4 - 4\,(b^3 d x + b^3 c)\log(F)^3 + 12\,(b^2 d^2 x^2 + 2\, b^2 c d x + b^2 c^2)\log(F)^2 - 24\,(b d^3 x^3 + 3\, b c d^2 x^2 + 3\, b c^2 d x + b c^3)\log(F)\right) F^{\frac{adx+ac+b}{dx+c}}}{(b^5 d^5 x^4 + 4\, b^5 c d^4 x^3 + 6\, b^5 c^2 d^3 x^2 + 4\, b^5 c^3 d^2 x + b^5 c^4 d)\log(F)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^6,x, algorithm="fricas")
```

```
[Out] -(24*d^4*x^4 + b^4*log(F)^4 + 96*c*d^3*x^3 + 144*c^2*d^2*x^2 + 96*c^3*d*x +
 24*c^4 - 4*(b^3*d*x + b^3*c)*log(F)^3 + 12*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^
```

```
2*c^2)*log(F)^2 - 24*(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(
F))*F^((a*d*x + a*c + b)/(d*x + c))/((b^5*d^5*x^4 + 4*b^5*c*d^4*x^3 + 6*b^5
*c^2*d^3*x^2 + 4*b^5*c^3*d^2*x + b^5*c^4*d)*log(F)^5)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 272 vs. $2(90) = 180$.
time = 0.15, size = 272, normalized size = 2.96

$$\frac{F^{a+\frac{b}{c+dx}}\left(-b^4\log(F)^4+4b^3c\log(F)^3+4b^3dx\log(F)^3-12b^2c^2\log(F)^2-24b^2cdx\log(F)^2-12b^2d^2x^2\log(F)^2+24bc^3\log(F)+72bc^2dx\log(F)+72bcd^2x^2\log(F)+24bd^3x^3\log(F)-24c^4-96c^3dx-144c^2d^2x^2-96cd^3x^3-24d^4x^4\right)}{b^5c^4d\log(F)^5+4b^5c^3d^2x\log(F)^5+6b^5c^2d^3x^2\log(F)^5+4b^5cd^4x^3\log(F)^5+b^5d^5x^4\log(F)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))/(d*x+c)**6,x)
```

```
[Out] F**(a + b/(c + d*x))*(-b**4*log(F)**4 + 4*b**3*c*log(F)**3 + 4*b**3*d*x*log
(F)**3 - 12*b**2*c**2*log(F)**2 - 24*b**2*c*d*x*log(F)**2 - 12*b**2*d**2*x*
*2*log(F)**2 + 24*b*c**3*log(F) + 72*b*c**2*d*x*log(F) + 72*b*c*d**2*x**2*l
og(F) + 24*b*d**3*x**3*log(F) - 24*c**4 - 96*c**3*d*x - 144*c**2*d**2*x**2
- 96*c*d**3*x**3 - 24*d**4*x**4)/(b**5*c**4*d*log(F)**5 + 4*b**5*c**3*d**2*
x*log(F)**5 + 6*b**5*c**2*d**3*x**2*log(F)**5 + 4*b**5*c*d**4*x**3*log(F)**
5 + b**5*d**5*x**4*log(F)**5)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^6,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(d*x + c)^6, x)
```

Mupad [B]
time = 3.88, size = 231, normalized size = 2.51

$$-\frac{F^{a+\frac{b}{c+d\,x}}\,\left(\frac{b^4\,\ln(F)^4-4\,b^3\,c\,\ln(F)^3+12\,b^2\,c^2\,\ln(F)^2-24\,b\,c^3\,\ln(F)+24\,c^4}{b^5\,d^5\,\ln(F)^5}+\frac{24\,x^4}{b^5\,d\,\ln(F)^5}+\frac{x^2\,\left(12\,b^2\,\ln(F)^2-72\,b\,c\,\ln(F)+144\,c^2\right)}{b^5\,d^3\,\ln(F)^5}+\frac{x^3\,\left(96\,c-24\,b\,\ln(F)\right)}{b^5\,d^2\,\ln(F)^5}-\frac{4\,x\,\left(b^3\,\ln(F)^3-6\,b^2\,c\,\ln(F)^2+18\,b\,c^2\,\ln(F)-24\,c^3\right)}{b^5\,d^4\,\ln(F)^5}\right)}{x^4+\frac{c^4}{d^4}+\frac{4\,c\,x^3}{d}+\frac{4\,c^3\,x}{d^3}+\frac{6\,c^2\,x^2}{d^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))/(c + d*x)^6,x)
```

```
[Out] -(F^(a + b/(c + d*x))*((b^4*log(F)^4 + 24*c^4 - 24*b*c^3*log(F) - 4*b^3*c*l
og(F)^3 + 12*b^2*c^2*log(F)^2)/(b^5*d^5*log(F)^5) + (24*x^4)/(b^5*d*log(F)^
5) + (x^2*(12*b^2*log(F)^2 + 144*c^2 - 72*b*c*log(F)))/(b^5*d^3*log(F)^5) +
 (x^3*(96*c - 24*b*log(F)))/(b^5*d^2*log(F)^5) - (4*x*(b^3*log(F)^3 - 24*c^
3 + 18*b*c^2*log(F) - 6*b^2*c*log(F)^2))/(b^5*d^4*log(F)^5)))/(x^4 + c^4/d^
4 + (4*c*x^3)/d + (4*c^3*x)/d^3 + (6*c^2*x^2)/d^2)
```

3.313 $\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^7} \, dx$

Optimal. Leaf size=108

$$\frac{F^{a+\frac{b}{c+dx}}\left(120(c+dx)^5-120b(c+dx)^4\log(F)+60b^2(c+dx)^3\log^2(F)-20b^3(c+dx)^2\log^3(F)+5b^4(c+d\right.}{b^6d(c+dx)^5\log^6(F)}$$

```
[Out] F^(a+b/(d*x+c))*(120*(d*x+c)^5-120*b*(d*x+c)^4*ln(F)+60*b^2*(d*x+c)^3*ln(F)
^2-20*b^3*(d*x+c)^2*ln(F)^3+5*b^4*(d*x+c)*ln(F)^4-b^5*ln(F)^5)/b^6/d/(d*x+c
)^5/ln(F)^6
```

Rubi [A]
time = 0.05, antiderivative size = 108, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2249}

$$\frac{F^{a+\frac{b}{c+dx}}\left(-b^5\log^5(F)+5b^4\log^4(F)(c+dx)-20b^3\log^3(F)(c+dx)^2+60b^2\log^2(F)(c+dx)^3-120b\log(F)(c+dx)^4+120(c+dx)^5\right)}{b^6d\log^6(F)(c+dx)^5}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))/(c + d*x)^7,x]
```

```
[Out] (F^(a + b/(c + d*x))*(120*(c + d*x)^5 - 120*b*(c + d*x)^4*Log[F] + 60*b^2*(
c + d*x)^3*Log[F]^2 - 20*b^3*(c + d*x)^2*Log[F]^3 + 5*b^4*(c + d*x)*Log[F]^
4 - b^5*Log[F]^5))/(b^6*d*(c + d*x)^5*Log[F]^6)
```

Rule 2249

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> With[{p = Simplify[(m + 1)/n]}, Simp[(-F^a)*((f/d)^m/(d*n*
((-b)*Log[F])^p))*Simplify[FunctionExpand[Gamma[p, (-b)*(c + d*x)^n*Log[F]]
]], x] /; IGtQ[p, 0]] /; FreeQ[{F, a, b, c, d, e, f, m, n}, x] && EqQ[d*e -
 c*f, 0] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^7} \, dx = \frac{F^a\Gamma\left(6,-\frac{b\log(F)}{c+dx}\right)}{b^6d\log^6(F)}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

time = 0.01, size = 28, normalized size = 0.26

$$\frac{F^a\Gamma\left(6,-\frac{b\log(F)}{c+dx}\right)}{b^6d\log^6(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))/(c + d*x)^7,x]
```

```
[Out] (F^a*Gamma[6, -((b*Log[F])/(c + d*x))])/(b^6*d*Log[F]^6)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 270 vs. 2(108) = 216.
time = 0.08, size = 271, normalized size = 2.51

method	result
risch	$-\frac{\left(b^5\ln(F)^5-5\ln(F)^4b^4dx+20\ln(F)^3b^3d^2x^2-60\ln(F)^2b^2d^3x^3+120\ln(F)bd^4x^4-120d^5x^5-5\ln(F)^4b^4c+40\ln(F)^3b^3cdx-180\ln(F\right.}{}$
norman	$\frac{\frac{120d^5x^6e^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{\ln(F)^6b^6}-\frac{\left(b^5\ln(F)^5-10\ln(F)^4b^4c+60\ln(F)^3b^3c^2-240\ln(F)^2b^2c^3+600\ln(F)bc^4-720c^5\right)xe^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{\ln(F)^6b^6}+\frac{5d\left(b^4\ln(F)^4-\right.}{}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c))/(d*x+c)^7,x,method=_RETURNVERBOSE)
```

```
[Out] -(b^5*ln(F)^5-5*ln(F)^4*b^4*d*x+20*ln(F)^3*b^3*d^2*x^2-60*ln(F)^2*b^2*d^3*x
^3+120*ln(F)*b*d^4*x^4-120*d^5*x^5-5*ln(F)^4*b^4*c+40*ln(F)^3*b^3*c*d*x-180
*ln(F)^2*b^2*c*d^2*x^2+480*ln(F)*b*c*d^3*x^3-600*c*d^4*x^4+20*ln(F)^3*b^3*c
^2-180*ln(F)^2*b^2*c^2*d*x+720*ln(F)*b*c^2*d^2*x^2-1200*c^2*d^3*x^3-60*ln(F
)^2*b^2*c^3+480*ln(F)*b*c^3*d*x-1200*c^3*d^2*x^2+120*ln(F)*b*c^4-600*c^4*d*
x-120*c^5)/b^6/ln(F)^6/d/(d*x+c)^5*F^((a*d*x+a*c+b)/(d*x+c))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^7,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(d*x + c)^7, x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 302 vs. 2(108) = 216.
time = 0.39, size = 302, normalized size = 2.80

$$\frac{\left(120\,d^5x^5-b^5\log\left(F\right)^5+600\,cd^4x^4+1200\,c^2d^3x^3+1200\,c^3d^2x^2+600\,c^4dx+120\,c^5+5\left(b^4dx+b^4c\right)\log\left(F\right)^4-20\left(b^3d^2x^2+2\,b^3cdx+b^3c^2\right)\log\left(F\right)^3+60\left(b^2d^3x^3+3\,b^2cd^2x^2+3\,b^2c^2dx+b^2c^3\right)\log\left(F\right)^2-120\left(bd^4x^4+4\,bcd^3x^3+6\,bc^2d^2x^2+4\,bc^3dx+bc^4\right)\log\left(F\right)\right)F^{\frac{adx+ac+b}{dx+c}}}{\left(b^6d^6x^5+5\,b^6cd^5x^4+10\,b^6c^2d^4x^3+10\,b^6c^3d^3x^2+5\,b^6c^4d^2x+b^6c^5d\right)\log\left(F\right)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^7,x, algorithm="fricas")
```

```
[Out] (120*d^5*x^5 - b^5*log(F)^5 + 600*c*d^4*x^4 + 1200*c^2*d^3*x^3 + 1200*c^3*d
^2*x^2 + 600*c^4*d*x + 120*c^5 + 5*(b^4*d*x + b^4*c)*log(F)^4 - 20*(b^3*d^2
*x^2 + 2*b^3*c*d*x + b^3*c^2)*log(F)^3 + 60*(b^2*d^3*x^3 + 3*b^2*c*d^2*x^2
+ 3*b^2*c^2*d*x + b^2*c^3)*log(F)^2 - 120*(b*d^4*x^4 + 4*b*c*d^3*x^3 + 6*b*
c^2*d^2*x^2 + 4*b*c^3*d*x + b*c^4)*log(F))*F^((a*d*x + a*c + b)/(d*x + c))/
((b^6*d^6*x^5 + 5*b^6*c*d^5*x^4 + 10*b^6*c^2*d^4*x^3 + 10*b^6*c^3*d^3*x^2 +
 5*b^6*c^4*d^2*x + b^6*c^5*d)*log(F)^6)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 388 vs. $2(105) = 210$.
time = 0.18, size = 388, normalized size = 3.59

$$\frac{F^{a+\frac{b}{c+dx}}\left(-b^5\log(F)^5+5b^4c\log(F)^4+5b^4dx\log(F)^4-20b^3c^2\log(F)^3-40b^3cdx\log(F)^3-20b^3d^2x^2\log(F)^3+60b^2c^3\log(F)^2+180b^2c^2dx\log(F)^2+180b^2cd^2x^2\log(F)^2+60b^2d^3x^3\log(F)^2-120bc^4\log(F)-480bc^3dx\log(F)-720bc^2d^2x^2\log(F)-480bcd^3x^3\log(F)-120bd^4x^4\log(F)+120c^5+600c^4dx+1200c^3d^2x^2+1200c^2d^3x^3+600cd^4x^4+120d^5x^5\right)}{b^6c^5d\log(F)^6+5b^6c^4d^2x\log(F)^6+10b^6c^3d^3x^2\log(F)^6+10b^6c^2d^4x^3\log(F)^6+5b^6cd^5x^4\log(F)^6+b^6d^6x^5\log(F)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))/(d*x+c)**7,x)
```

```
[Out] F**(a + b/(c + d*x))*(-b**5*log(F)**5 + 5*b**4*c*log(F)**4 + 5*b**4*d*x*log
(F)**4 - 20*b**3*c**2*log(F)**3 - 40*b**3*c*d*x*log(F)**3 - 20*b**3*d**2*x*
*2*log(F)**3 + 60*b**2*c**3*log(F)**2 + 180*b**2*c**2*d*x*log(F)**2 + 180*b
**2*c*d**2*x**2*log(F)**2 + 60*b**2*d**3*x**3*log(F)**2 - 120*b*c**4*log(F)
 - 480*b*c**3*d*x*log(F) - 720*b*c**2*d**2*x**2*log(F) - 480*b*c*d**3*x**3*
log(F) - 120*b*d**4*x**4*log(F) + 120*c**5 + 600*c**4*d*x + 1200*c**3*d**2*
x**2 + 1200*c**2*d**3*x**3 + 600*c*d**4*x**4 + 120*d**5*x**5)/(b**6*c**5*d*
log(F)**6 + 5*b**6*c**4*d**2*x*log(F)**6 + 10*b**6*c**3*d**3*x**2*log(F)**6
 + 10*b**6*c**2*d**4*x**3*log(F)**6 + 5*b**6*c*d**5*x**4*log(F)**6 + b**6*d
**6*x**5*log(F)**6)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^7,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(d*x + c)^7, x)
```

Mupad [B]
time = 3.94, size = 315, normalized size = 2.92

$$\frac{F^a\,F^{\frac{b}{c+d\,x}}\,\left(\frac{120\,x^5}{b^6\,d\,\ln(F)^6}-\frac{b^5\,\ln(F)^5-5\,b^4\,c\,\ln(F)^4+20\,b^3\,c^2\,\ln(F)^3-60\,b^2\,c^3\,\ln(F)^2+120\,b\,c^4\,\ln(F)-120\,c^5}{b^6\,d^6\,\ln(F)^6}-\frac{20\,x^2\,\left(b^3\,\ln(F)^3-9\,b^2\,c\,\ln(F)^2+36\,b\,c^2\,\ln(F)-60\,c^3\right)}{b^6\,d^4\,\ln(F)^6}+\frac{60\,x^3\,\left(b^2\,\ln(F)^2-8\,b\,c\,\ln(F)+20\,c^2\right)}{b^6\,d^3\,\ln(F)^6}+\frac{120\,x^4\,\left(5\,c-b\,\ln(F)\right)}{b^6\,d^2\,\ln(F)^6}+\frac{5\,x\,\left(b^4\,\ln(F)^4-8\,b^3\,c\,\ln(F)^3+36\,b^2\,c^2\,\ln(F)^2-96\,b\,c^3\,\ln(F)+120\,c^4\right)}{b^6\,d^5\,\ln(F)^6}\right)}{x^5+\frac{c^5}{d^5}+\frac{5\,c\,x^4}{d}+\frac{5\,c^4\,x}{d^4}+\frac{10\,c^2\,x^3}{d^2}+\frac{10\,c^3\,x^2}{d^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))/(c + d*x)^7,x)
```

```
[Out] (F^a*F^(b/(c + d*x))*((120*x^5)/(b^6*d*log(F)^6) - (b^5*log(F)^5 - 120*c^5
+ 120*b*c^4*log(F) - 5*b^4*c*log(F)^4 - 60*b^2*c^3*log(F)^2 + 20*b^3*c^2*lo
g(F)^3)/(b^6*d^6*log(F)^6) - (20*x^2*(b^3*log(F)^3 - 60*c^3 + 36*b*c^2*log(
F) - 9*b^2*c*log(F)^2))/(b^6*d^4*log(F)^6) + (60*x^3*(b^2*log(F)^2 + 20*c^2
 - 8*b*c*log(F)))/(b^6*d^3*log(F)^6) + (120*x^4*(5*c - b*log(F)))/(b^6*d^2*
log(F)^6) + (5*x*(b^4*log(F)^4 + 120*c^4 - 96*b*c^3*log(F) - 8*b^3*c*log(F)
^3 + 36*b^2*c^2*log(F)^2))/(b^6*d^5*log(F)^6)))/(x^5 + c^5/d^5 + (5*c*x^4)/
d + (5*c^4*x)/d^4 + (10*c^2*x^3)/d^2 + (10*c^3*x^2)/d^3)
```

3.314 $\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^m\,dx$

Optimal. Leaf size=61

$$\frac{F^a(c+dx)^{1+m}\Gamma\left(\frac{1}{2}(-1-m),-\frac{b\log(F)}{(c+dx)^2}\right)\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{\frac{1+m}{2}}}{2d}$$

```
[Out] 1/2*F^a*(d*x+c)^(1+m)*GAMMA(-1/2-1/2*m,-b*ln(F)/(d*x+c)^2)*(-b*ln(F)/(d*x+c
)^2)^(1/2+1/2*m)/d
```

Rubi [A]
time = 0.03, antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$\frac{F^a(c+dx)^{m+1}\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{\frac{m+1}{2}}\text{Gamma}\left(\frac{1}{2}(-m-1),-\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)*(c + d*x)^m,x]
```

```
[Out] (F^a*(c + d*x)^(1 + m)*Gamma[(-1 - m)/2, -((b*Log[F])/(c + d*x)^2)]*(-((b*L
og[F])/(c + d*x)^2))^((1 + m)/2))/(2*d)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^m\,dx=\frac{F^a(c+dx)^{1+m}\Gamma\left(\frac{1}{2}(-1-m),-\frac{b\log(F)}{(c+dx)^2}\right)\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{\frac{1+m}{2}}}{2d}$$

Mathematica [A]
time = 0.03, size = 61, normalized size = 1.00

$$\frac{F^a(c+dx)^{1+m}\Gamma\left(\frac{1}{2}(-1-m),-\frac{b\log(F)}{(c+dx)^2}\right)\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{\frac{1+m}{2}}}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)*(c + d*x)^m,x]
```

```
[Out] (F^a*(c + d*x)^(1 + m)*Gamma[(-1 - m)/2, -((b*Log[F])/(c + d*x)^2)]*(-((b*L
og[F])/(c + d*x)^2))^((1 + m)/2))/(2*d)
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(dx+c)^2}} (dx+c)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^2)*(d*x+c)^m,x)
```

```
[Out] int(F^(a+b/(d*x+c)^2)*(d*x+c)^m,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^m,x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^m*F^(a + b/(d*x + c)^2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^m,x, algorithm="fricas")
```

```
[Out] integral((d*x + c)^m*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*
d*x + c^2)), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)*(d*x+c)**m,x)
```

[Out] Timed out

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^m,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^m*F^(a + b/(d*x + c)^2), x)
```

Mupad [B]
time = 3.76, size = 73, normalized size = 1.20

$$\frac{F^a\,\mathrm{e}^{\frac{b\,\ln(F)}{2\,(c+d\,x)^2}}\,(c+d\,x)^{m+1}\,\mathrm{M}_{\frac{m}{4}+\frac{3}{4},-\frac{m}{4}-\frac{1}{4}}\left(\frac{b\,\ln(F)}{(c+d\,x)^2}\right)\,\left(\frac{b\,\ln(F)}{(c+d\,x)^2}\right)^{\frac{m}{4}-\frac{1}{4}}}{d\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)*(c + d*x)^m,x)
```

```
[Out] (F^a*exp((b*log(F))/(2*(c + d*x)^2))*(c + d*x)^(m + 1)*whittakerM(m/4 + 3/4
, - m/4 - 1/4, (b*log(F))/(c + d*x)^2)*((b*log(F))/(c + d*x)^2)^(m/4 - 1/4)
)/(d*(m + 1))
```

3.315 $\int F^{a+\frac{b}{(c+dx)^2}} (c+dx)^9 \, dx$

Optimal. Leaf size=31

$$-\frac{b^5 F^a \Gamma\left(-5,-\frac{b \log(F)}{(c+dx)^2}\right) \log^5(F)}{2d}$$

[Out] 1/2*F^a*(d*x+c)^10*Ei(6,-b*ln(F)/(d*x+c)^2)/d

Rubi [A]
time = 0.03, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = $\{2250\}$

$$-\frac{b^5 F^a \log^5(F) \text{Gamma}\left(-5,-\frac{b \log(F)}{(c+dx)^2}\right)}{2d}$$

Antiderivative was successfully verified.

[In] Int[F^(a + b/(c + d*x)^2)*(c + d*x)^9,x]

[Out] -1/2*(b^5*F^a*Gamma[-5, -((b*Log[F])/(c + d*x)^2)]*Log[F]^5)/d

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^2}} (c+dx)^9 \, dx = -\frac{b^5 F^a \Gamma\left(-5,-\frac{b \log(F)}{(c+dx)^2}\right) \log^5(F)}{2d}$$

Mathematica [A]
time = 0.01, size = 31, normalized size = 1.00

$$-\frac{b^5 F^a \Gamma\left(-5,-\frac{b \log(F)}{(c+dx)^2}\right) \log^5(F)}{2d}$$

Antiderivative was successfully verified.

[In] Integrate[F^(a + b/(c + d*x)^2)*(c + d*x)^9,x]

```
[Out] -1/2*(b^5*F^a*Gamma[-5, -((b*Log[F])/(c + d*x)^2)]*Log[F]^5)/d
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 960 vs. $2(29) = 58$.
time = 0.10, size = 961, normalized size = 31.00

method	result
risch	$\frac{F^a b^5 \ln(F)^5 \operatorname{expIntegral}\left(1,-\frac{b\ln(F)}{(dx+c)^2}\right)}{240d}+\frac{F^a d^6 b \ln(F) F^{\frac{b}{(dx+c)^2}} c x^7}{5}+\frac{7F^a d^5 b \ln(F) F^{\frac{b}{(dx+c)^2}} c^2 x^6}{10}+\frac{7F^a d^4 b \ln(F) F^{\frac{b}{(dx+c)^2}}}{5}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^2)*(d*x+c)^9,x,method=_RETURNVERBOSE)
```

```
[Out] 1/5*F^a*d^6*b*ln(F)*F^(b/(d*x+c)^2)*c*x^7+7/10*F^a*d^5*b*ln(F)*F^(b/(d*x+c)
^2)*c^2*x^6+7/5*F^a*d^4*b*ln(F)*F^(b/(d*x+c)^2)*c^3*x^5+7/5*F^a*d^2*b*ln(F)
*F^(b/(d*x+c)^2)*c^5*x^3+7/10*F^a*d*b*ln(F)*F^(b/(d*x+c)^2)*c^6*x^2+7/4*F^a
*d^3*b*ln(F)*F^(b/(d*x+c)^2)*c^4*x^4+1/20*F^a*d^4*b^2*ln(F)^2*F^(b/(d*x+c)^
2)*c*x^5+1/8*F^a*d^3*b^2*ln(F)^2*F^(b/(d*x+c)^2)*c^2*x^4+1/6*F^a*d^2*b^2*ln
(F)^2*F^(b/(d*x+c)^2)*c^3*x^3+1/8*F^a*d*b^2*ln(F)^2*F^(b/(d*x+c)^2)*c^4*x^2
+1/60*F^a*d^2*b^3*ln(F)^3*F^(b/(d*x+c)^2)*c*x^3+1/40*F^a*d*b^3*ln(F)^3*F^(b
/(d*x+c)^2)*c^2*x^2+9/2*F^a*d^7*F^(b/(d*x+c)^2)*c^2*x^8+12*F^a*d^6*F^(b/(d*
x+c)^2)*c^3*x^7+21*F^a*d^5*F^(b/(d*x+c)^2)*c^4*x^6+126/5*F^a*d^4*F^(b/(d*x+
c)^2)*c^5*x^5+21*F^a*d^3*F^(b/(d*x+c)^2)*c^6*x^4+12*F^a*d^2*F^(b/(d*x+c)^2)
*c^7*x^3+9/2*F^a*d*F^(b/(d*x+c)^2)*c^8*x^2+1/240*F^a/d*b^5*ln(F)^5*Ei(1,-b*
ln(F)/(d*x+c)^2)+F^a*d^8*F^(b/(d*x+c)^2)*c*x^9+F^a*F^(b/(d*x+c)^2)*c^9*x+1/
10*F^a*d^9*F^(b/(d*x+c)^2)*x^10+1/10*F^a/d*F^(b/(d*x+c)^2)*c^10+1/240*F^a*d
^3*b^3*ln(F)^3*F^(b/(d*x+c)^2)*x^4+1/240*F^a*d*b^4*ln(F)^4*F^(b/(d*x+c)^2)*
x^2+1/40*F^a/d*b*ln(F)*F^(b/(d*x+c)^2)*c^8+1/120*F^a/d*b^2*ln(F)^2*F^(b/(d*
x+c)^2)*c^6+1/240*F^a/d*b^3*ln(F)^3*F^(b/(d*x+c)^2)*c^4+1/240*F^a/d*b^4*ln(
F)^4*F^(b/(d*x+c)^2)*c^2+1/20*F^a*b^2*ln(F)^2*F^(b/(d*x+c)^2)*c^5*x+1/60*F^
a*b^3*ln(F)^3*F^(b/(d*x+c)^2)*c^3*x+1/120*F^a*b^4*ln(F)^4*F^(b/(d*x+c)^2)*c
*x+1/5*F^a*b*ln(F)*F^(b/(d*x+c)^2)*c^7*x+1/40*F^a*d^7*b*ln(F)*F^(b/(d*x+c)^
2)*x^8+1/120*F^a*d^5*b^2*ln(F)^2*F^(b/(d*x+c)^2)*x^6
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^9,x, algorithm="maxima")
```

```
[Out] 1/240*(24*F^a*d^9*x^10 + 240*F^a*c*d^8*x^9 + 6*(180*F^a*c^2*d^7 + F^a*b*d^7
*log(F))*x^8 + 48*(60*F^a*c^3*d^6 + F^a*b*c*d^6*log(F))*x^7 + 2*(2520*F^a*c
^4*d^5 + 84*F^a*b*c^2*d^5*log(F) + F^a*b^2*d^5*log(F)^2)*x^6 + 12*(504*F^a*
```

```
c^5*d^4 + 28*F^a*b*c^3*d^4*log(F) + F^a*b^2*c*d^4*log(F)^2)*x^5 + (5040*F^a
*c^6*d^3 + 420*F^a*b*c^4*d^3*log(F) + 30*F^a*b^2*c^2*d^3*log(F)^2 + F^a*b^3
*d^3*log(F)^3)*x^4 + 4*(720*F^a*c^7*d^2 + 84*F^a*b*c^5*d^2*log(F) + 10*F^a*
b^2*c^3*d^2*log(F)^2 + F^a*b^3*c*d^2*log(F)^3)*x^3 + (1080*F^a*c^8*d + 168*
F^a*b*c^6*d*log(F) + 30*F^a*b^2*c^4*d*log(F)^2 + 6*F^a*b^3*c^2*d*log(F)^3 +
 F^a*b^4*d*log(F)^4)*x^2 + 2*(120*F^a*c^9 + 24*F^a*b*c^7*log(F) + 6*F^a*b^2
*c^5*log(F)^2 + 2*F^a*b^3*c^3*log(F)^3 + F^a*b^4*c*log(F)^4)*x)*F^(b/(d^2*x
^2 + 2*c*d*x + c^2)) + integrate(1/120*(F^a*b^5*d^2*x^2*log(F)^5 + 2*F^a*b^
5*c*d*x*log(F)^5 - 24*F^a*b*c^10*log(F) - 6*F^a*b^2*c^8*log(F)^2 - 2*F^a*b^
3*c^6*log(F)^3 - F^a*b^4*c^4*log(F)^4)*F^(b/(d^2*x^2 + 2*c*d*x + c^2))/(d^3
*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3), x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 465 vs. $2(29) = 58$.
time = 0.10, size = 465, normalized size = 15.00

$$-\frac{F^a b^5 \operatorname{Ei}\left(\frac{b\log(F)}{d^2x^2+2\,cdx+c^2}\right)\log(F)^5-\left(24\,d^{10}x^{10}+240\,cd^9x^9+1080\,c^2d^8x^8+2880\,c^3d^7x^7+5040\,c^4d^6x^6+6048\,c^5d^5x^5+5040\,c^6d^4x^4+2880\,c^7d^3x^3+1080\,c^8d^2x^2+240\,c^9dx+24\,c^{10}+(b^4d^2x^2+2\,b^4cdx+b^4c^2)\log(F)^4+(b^3d^4x^4+4\,b^3cd^3x^3+6\,b^3c^2d^2x^2+4\,b^3c^3dx+b^3c^4)\log(F)^3+2\,(b^2d^6x^6+6\,b^2cd^5x^5+15\,b^2c^2d^4x^4+20\,b^2c^3d^3x^3+15\,b^2c^4d^2x^2+6\,b^2c^5dx+b^2c^6)\log(F)^2+6\,(bd^8x^8+8\,bcd^7x^7+28\,bc^2d^6x^6+56\,bc^3d^5x^5+70\,bc^4d^4x^4+56\,bc^5d^3x^3+28\,bc^6d^2x^2+8\,bc^7dx+bc^8)\log(F)\right)F^{\frac{ad^2x^2+2\,acdx+ac^2+b}{d^2x^2+2\,cdx+c^2}}}{240\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^9,x, algorithm="fricas")
```

```
[Out] -1/240*(F^a*b^5*Ei(b*log(F)/(d^2*x^2 + 2*c*d*x + c^2))*log(F)^5 - (24*d^10*
x^10 + 240*c*d^9*x^9 + 1080*c^2*d^8*x^8 + 2880*c^3*d^7*x^7 + 5040*c^4*d^6*x
^6 + 6048*c^5*d^5*x^5 + 5040*c^6*d^4*x^4 + 2880*c^7*d^3*x^3 + 1080*c^8*d^2*
x^2 + 240*c^9*d*x + 24*c^10 + (b^4*d^2*x^2 + 2*b^4*c*d*x + b^4*c^2)*log(F)^
4 + (b^3*d^4*x^4 + 4*b^3*c*d^3*x^3 + 6*b^3*c^2*d^2*x^2 + 4*b^3*c^3*d*x + b^
3*c^4)*log(F)^3 + 2*(b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + 2
0*b^2*c^3*d^3*x^3 + 15*b^2*c^4*d^2*x^2 + 6*b^2*c^5*d*x + b^2*c^6)*log(F)^2
+ 6*(b*d^8*x^8 + 8*b*c*d^7*x^7 + 28*b*c^2*d^6*x^6 + 56*b*c^3*d^5*x^5 + 70*b
*c^4*d^4*x^4 + 56*b*c^5*d^3*x^3 + 28*b*c^6*d^2*x^2 + 8*b*c^7*d*x + b*c^8)*l
og(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2)))/d
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(c+dx)^2}}\,(c+dx)^9\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)*(d*x+c)**9,x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**2)*(c + d*x)**9, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^9,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^9*F^(a + b/(d*x + c)^2), x)
```

Mupad [B]
time = 3.95, size = 136, normalized size = 4.39

$$\frac{F^a\,b^5\ln\left(F\right)^5\,\mathrm{expint}\left(-\frac{b\,\ln(F)}{(c+d\,x)^2}\right)}{240\,d}+\frac{F^a\,F^{\frac{b}{(c+d\,x)^2}}\,b^5\ln\left(F\right)^5\left(\frac{(c+d\,x)^2}{120\,b\,\ln(F)}+\frac{(c+d\,x)^4}{120\,b^2\ln(F)^2}+\frac{(c+d\,x)^6}{60\,b^3\ln(F)^3}+\frac{(c+d\,x)^8}{20\,b^4\ln(F)^4}+\frac{(c+d\,x)^{10}}{5\,b^5\ln(F)^5}\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)*(c + d*x)^9,x)
```

```
[Out] (F^a*b^5*log(F)^5*expint(-(b*log(F))/(c + d*x)^2))/(240*d) + (F^a*F^(b/(c +
 d*x)^2)*b^5*log(F)^5*((c + d*x)^2/(120*b*log(F)) + (c + d*x)^4/(120*b^2*lo
g(F)^2) + (c + d*x)^6/(60*b^3*log(F)^3) + (c + d*x)^8/(20*b^4*log(F)^4) + (
c + d*x)^10/(5*b^5*log(F)^5)))/(2*d)
```

3.316 $\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^7\,dx$

Optimal. Leaf size=31

$$\frac{b^4F^a\Gamma\left(-4,-\frac{b\log(F)}{(c+dx)^2}\right)\log^4(F)}{2d}$$

[Out] 1/2*F^a*(d*x+c)^8*Ei(5,-b*ln(F)/(d*x+c)^2)/d

Rubi [A]
time = 0.03, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$\frac{b^4F^a\log^4(F)\text{Gamma}\left(-4,-\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

Antiderivative was successfully verified.

[In] Int[F^(a + b/(c + d*x)^2)*(c + d*x)^7,x]

[Out] (b^4*F^a*Gamma[-4, -((b*Log[F])/(c + d*x)^2)]*Log[F]^4)/(2*d)

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^7\,dx=\frac{b^4F^a\Gamma\left(-4,-\frac{b\log(F)}{(c+dx)^2}\right)\log^4(F)}{2d}$$

Mathematica [A]
time = 0.01, size = 31, normalized size = 1.00

$$\frac{b^4F^a\Gamma\left(-4,-\frac{b\log(F)}{(c+dx)^2}\right)\log^4(F)}{2d}$$

Antiderivative was successfully verified.

[In] Integrate[F^(a + b/(c + d*x)^2)*(c + d*x)^7,x]

```
[Out] (b^4*F^a*Gamma[-4, -((b*Log[F])/(c + d*x)^2)]*Log[F]^4)/(2*d)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 645 vs. $2(29) = 58$.
time = 0.08, size = 646, normalized size = 20.84

method	result
risch	$F^a d^6 F^{\frac{b}{(dx+c)^2}} c\,x^7 + \frac{7F^a d^5 F^{\frac{b}{(dx+c)^2}} c^2 x^6}{2} + 7F^a d^4 F^{\frac{b}{(dx+c)^2}} c^3 x^5 + \frac{35F^a d^3 F^{\frac{b}{(dx+c)^2}} c^4 x^4}{4} + 7F^a d^2 F^{\frac{b}{(dx+c)^2}} c^5$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^2)*(d*x+c)^7,x,method=_RETURNVERBOSE)
```

```
[Out] F^a*d^6*F^(b/(d*x+c)^2)*c*x^7+7/2*F^a*d^5*F^(b/(d*x+c)^2)*c^2*x^6+7*F^a*d^4
*F^(b/(d*x+c)^2)*c^3*x^5+35/4*F^a*d^3*F^(b/(d*x+c)^2)*c^4*x^4+7*F^a*d^2*F^(
b/(d*x+c)^2)*c^5*x^3+7/2*F^a*d*F^(b/(d*x+c)^2)*c^6*x^2+1/48*F^a/d*b^4*ln(F)
^4*Ei(1,-b*ln(F)/(d*x+c)^2)+F^a*F^(b/(d*x+c)^2)*c^7*x+1/8*F^a/d*F^(b/(d*x+c
)^2)*c^8+1/8*F^a*d^7*F^(b/(d*x+c)^2)*x^8+5/6*F^a*d^2*b*ln(F)*F^(b/(d*x+c)^2
)*c^3*x^3+5/8*F^a*d*b*ln(F)*F^(b/(d*x+c)^2)*c^4*x^2+1/12*F^a*d^2*b^2*ln(F)^
2*F^(b/(d*x+c)^2)*c*x^3+1/8*F^a*d*b^2*ln(F)^2*F^(b/(d*x+c)^2)*c^2*x^2+1/4*F
^a*d^4*b*ln(F)*F^(b/(d*x+c)^2)*c*x^5+5/8*F^a*d^3*b*ln(F)*F^(b/(d*x+c)^2)*c^
2*x^4+1/24*F^a*d^5*b*ln(F)*F^(b/(d*x+c)^2)*x^6+1/48*F^a*d^3*b^2*ln(F)^2*F^(
b/(d*x+c)^2)*x^4+1/48*F^a*d*b^3*ln(F)^3*F^(b/(d*x+c)^2)*x^2+1/24*F^a/d*b*ln
(F)*F^(b/(d*x+c)^2)*c^6+1/4*F^a*b*ln(F)*F^(b/(d*x+c)^2)*c^5*x+1/12*F^a*b^2*
ln(F)^2*F^(b/(d*x+c)^2)*c^3*x+1/24*F^a*b^3*ln(F)^3*F^(b/(d*x+c)^2)*c*x+1/48
*F^a/d*b^2*ln(F)^2*F^(b/(d*x+c)^2)*c^4+1/48*F^a/d*b^3*ln(F)^3*F^(b/(d*x+c)^
2)*c^2
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^7,x, algorithm="maxima")
```

```
[Out] 1/48*(6*F^a*d^7*x^8 + 48*F^a*c*d^6*x^7 + 2*(84*F^a*c^2*d^5 + F^a*b*d^5*log(
F))*x^6 + 12*(28*F^a*c^3*d^4 + F^a*b*c*d^4*log(F))*x^5 + (420*F^a*c^4*d^3 +
 30*F^a*b*c^2*d^3*log(F) + F^a*b^2*d^3*log(F)^2)*x^4 + 4*(84*F^a*c^5*d^2 +
10*F^a*b*c^3*d^2*log(F) + F^a*b^2*c*d^2*log(F)^2)*x^3 + (168*F^a*c^6*d + 30
*F^a*b*c^4*d*log(F) + 6*F^a*b^2*c^2*d*log(F)^2 + F^a*b^3*d*log(F)^3)*x^2 +
2*(24*F^a*c^7 + 6*F^a*b*c^5*log(F) + 2*F^a*b^2*c^3*log(F)^2 + F^a*b^3*c*log
(F)^3)*x)*F^(b/(d^2*x^2 + 2*c*d*x + c^2)) + integrate(1/24*(F^a*b^4*d^2*x^2
*log(F)^4 + 2*F^a*b^4*c*d*x*log(F)^4 - 6*F^a*b*c^8*log(F) - 2*F^a*b^2*c^6*l
og(F)^2 - F^a*b^3*c^4*log(F)^3)*F^(b/(d^2*x^2 + 2*c*d*x + c^2))/(d^3*x^3 +
3*c*d^2*x^2 + 3*c^2*d*x + c^3), x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 331 vs. $2(29) = 58$.

time = 0.12, size = 331, normalized size = 10.68

$$-\frac{F^a b^4 \mathrm{Ei}\left(\frac{b\log(F)}{d^2x^2+2\,cdx+c^2}\right)\log(F)^4 - \left(6\,d^8x^8 + 48\,cd^7x^7 + 168\,c^2d^6x^6 + 336\,c^3d^5x^5 + 420\,c^4d^4x^4 + 336\,c^5d^3x^3 + 168\,c^6d^2x^2 + 48\,c^7dx + 6\,c^8 + (b^3d^2x^2 + 2\,b^3cdx + b^3c^2)\log(F)^3 + (b^2d^4x^4 + 4\,b^2cd^3x^3 + 6\,b^2c^2d^2x^2 + 4\,b^2c^3dx + b^2c^4)\log(F)^2 + 2\,(bd^6x^6 + 6\,bcd^5x^5 + 15\,bc^2d^4x^4 + 20\,bc^3d^3x^3 + 15\,bc^4d^2x^2 + 6\,bc^5dx + bc^6)\log(F)\right)F^{\frac{ad^2x^2+2\,acdx+ac^2+b}{d^2x^2+2\,cdx+c^2}}}{48\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^7,x, algorithm="fricas")
```

```
[Out] -1/48*(F^a*b^4*Ei(b*log(F)/(d^2*x^2 + 2*c*d*x + c^2))*log(F)^4 - (6*d^8*x^8
 + 48*c*d^7*x^7 + 168*c^2*d^6*x^6 + 336*c^3*d^5*x^5 + 420*c^4*d^4*x^4 + 336
*c^5*d^3*x^3 + 168*c^6*d^2*x^2 + 48*c^7*d*x + 6*c^8 + (b^3*d^2*x^2 + 2*b^3*
c*d*x + b^3*c^2)*log(F)^3 + (b^2*d^4*x^4 + 4*b^2*c*d^3*x^3 + 6*b^2*c^2*d^2*
x^2 + 4*b^2*c^3*d*x + b^2*c^4)*log(F)^2 + 2*(b*d^6*x^6 + 6*b*c*d^5*x^5 + 15
*b*c^2*d^4*x^4 + 20*b*c^3*d^3*x^3 + 15*b*c^4*d^2*x^2 + 6*b*c^5*d*x + b*c^6)
*log(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2)))
/d
```

Sympy [F]

time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(c+dx)^2}}\left(c+dx\right)^7\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)*(d*x+c)**7,x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**2)*(c + d*x)**7, x)
```

Giac [F]

time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^7,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^7*F^(a + b/(d*x + c)^2), x)
```

Mupad [B]

time = 3.84, size = 120, normalized size = 3.87

$$\frac{F^a\,b^4\,\ln\left(F\right)^4\,\mathrm{expint}\left(-\frac{b\,\ln(F)}{(c+d\,x)^2}\right)}{48\,d}+\frac{F^a\,F^{\frac{b}{(c+d\,x)^2}}\,b^4\,\ln\left(F\right)^4\,\left(\frac{(c+d\,x)^2}{24\,b\,\ln(F)}+\frac{(c+d\,x)^4}{24\,b^2\,\ln(F)^2}+\frac{(c+d\,x)^6}{12\,b^3\,\ln(F)^3}+\frac{(c+d\,x)^8}{4\,b^4\,\ln(F)^4}\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)*(c + d*x)^7,x)
```

```
[Out] (F^a*b^4*log(F)^4*expint(-(b*log(F))/(c + d*x)^2))/(48*d) + (F^a*F^(b/(c +
d*x)^2)*b^4*log(F)^4*((c + d*x)^2/(24*b*log(F)) + (c + d*x)^4/(24*b^2*log(F
)^2) + (c + d*x)^6/(12*b^3*log(F)^3) + (c + d*x)^8/(4*b^4*log(F)^4)))/(2*d)
```

3.317 $\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^5\,dx$

Optimal. Leaf size=121

$$\frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^6}{6d}+\frac{bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^4\log(F)}{12d}+\frac{b^2F^{a+\frac{b}{(c+dx)^2}}(c+dx)^2\log^2(F)}{12d}-\frac{b^3F^a\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)\log^3(F)}{12d}$$

```
[Out] 1/6*F^(a+b/(d*x+c)^2)*(d*x+c)^6/d+1/12*b*F^(a+b/(d*x+c)^2)*(d*x+c)^4*ln(F)/
d+1/12*b^2*F^(a+b/(d*x+c)^2)*(d*x+c)^2*ln(F)^2/d-1/12*b^3*F^a*Ei(b*ln(F)/(d
*x+c)^2)*ln(F)^3/d
```

Rubi [A]
time = 0.12, antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2245, 2241}

$$-\frac{b^3F^a\log^3(F)\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)}{12d}+\frac{b^2\log^2(F)(c+dx)^2F^{a+\frac{b}{(c+dx)^2}}}{12d}+\frac{(c+dx)^6F^{a+\frac{b}{(c+dx)^2}}}{6d}+\frac{b\log(F)(c+dx)^4F^{a+\frac{b}{(c+dx)^2}}}{12d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)*(c + d*x)^5,x]
```

```
[Out] (F^(a + b/(c + d*x)^2)*(c + d*x)^6)/(6*d) + (b*F^(a + b/(c + d*x)^2)*(c + d
*x)^4*Log[F])/(12*d) + (b^2*F^(a + b/(c + d*x)^2)*(c + d*x)^2*Log[F]^2)/(12
*d) - (b^3*F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)^2]*Log[F]^3)/(12*d)
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^5\,dx = \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^6}{6d} + \frac{1}{3}(b\log(F))\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\,dx$$

$$= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^6}{6d} + \frac{bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^4\log(F)}{12d} + \frac{1}{6}\left(b^2\log^2(F)\right)\int F^{a+\frac{b}{(c+dx)^2}}$$

$$= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^6}{6d} + \frac{bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^4\log(F)}{12d} + \frac{b^2F^{a+\frac{b}{(c+dx)^2}}(c+dx)^2\log^2(}{12d}$$

$$= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^6}{6d} + \frac{bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^4\log(F)}{12d} + \frac{b^2F^{a+\frac{b}{(c+dx)^2}}(c+dx)^2\log^2(}{12d}$$

Mathematica [A]
time = 0.11, size = 96, normalized size = 0.79

$$\frac{F^a\left(2F^{\frac{b}{(c+dx)^2}}(c+dx)^6+b\log(F)\left(F^{\frac{b}{(c+dx)^2}}(c+dx)^4+b\log(F)\left(F^{\frac{b}{(c+dx)^2}}(c+dx)^2-b\mathrm{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)\log(F)\right)\right)\right)}{12d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)*(c + d*x)^5,x]
```

```
[Out] (F^a*(2*F^(b/(c + d*x)^2)*(c + d*x)^6 + b*Log[F]*(F^(b/(c + d*x)^2)*(c + d*
x)^4 + b*Log[F]*(F^(b/(c + d*x)^2)*(c + d*x)^2 - b*ExpIntegralEi[(b*Log[F])
/(c + d*x)^2]*Log[F]))))/(12*d)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 394 vs. 2(113) = 226.
time = 0.08, size = 395, normalized size = 3.26

method	result
risch	$\frac{F^a d^5 F^{\frac{b}{(dx+c)^2}} x^6}{6} + F^a d^4 F^{\frac{b}{(dx+c)^2}} c x^5 + \frac{5F^a d^3 F^{\frac{b}{(dx+c)^2}} c^2 x^4}{2} + \frac{10F^a d^2 F^{\frac{b}{(dx+c)^2}} c^3 x^3}{3} + \frac{5F^a d F^{\frac{b}{(dx+c)^2}} c^4 x^2}{2} + F^a F$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^2)*(d*x+c)^5,x,method=_RETURNVERBOSE)
```

```
[Out] 1/6*F^a*d^5*F^(b/(d*x+c)^2)*x^6+F^a*d^4*F^(b/(d*x+c)^2)*c*x^5+5/2*F^a*d^3*F
^(b/(d*x+c)^2)*c^2*x^4+10/3*F^a*d^2*F^(b/(d*x+c)^2)*c^3*x^3+5/2*F^a*d*F^(b/
(d*x+c)^2)*c^4*x^2+F^a*F^(b/(d*x+c)^2)*c^5*x+1/6*F^a/d*F^(b/(d*x+c)^2)*c^6+
1/12*F^a*d^3*b*ln(F)*F^(b/(d*x+c)^2)*x^4+1/3*F^a*d^2*b*ln(F)*F^(b/(d*x+c)^2
)*c*x^3+1/2*F^a*d*b*ln(F)*F^(b/(d*x+c)^2)*c^2*x^2+1/3*F^a*b*ln(F)*F^(b/(d*x
+c)^2)*c^3*x+1/12*F^a/d*b*ln(F)*F^(b/(d*x+c)^2)*c^4+1/12*F^a*d*b^2*ln(F)^2*
```

```
F^(b/(d*x+c)^2)*x^2+1/6*F^a*b^2*ln(F)^2*F^(b/(d*x+c)^2)*c*x+1/12*F^a/d*b^2*
ln(F)^2*F^(b/(d*x+c)^2)*c^2+1/12*F^a/d*b^3*ln(F)^3*Ei(1,-b*ln(F)/(d*x+c)^2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^5,x, algorithm="maxima")
```

```
[Out] 1/12*(2*F^a*d^5*x^6 + 12*F^a*c*d^4*x^5 + (30*F^a*c^2*d^3 + F^a*b*d^3*log(F)
)*x^4 + 4*(10*F^a*c^3*d^2 + F^a*b*c*d^2*log(F))*x^3 + (30*F^a*c^4*d + 6*F^a
*b*c^2*d*log(F) + F^a*b^2*d*log(F)^2)*x^2 + 2*(6*F^a*c^5 + 2*F^a*b*c^3*log(
F) + F^a*b^2*c*log(F)^2)*x)*F^(b/(d^2*x^2 + 2*c*d*x + c^2)) + integrate(1/6
*(F^a*b^3*d^2*x^2*log(F)^3 + 2*F^a*b^3*c*d*x*log(F)^3 - 2*F^a*b*c^6*log(F)
- F^a*b^2*c^4*log(F)^2)*F^(b/(d^2*x^2 + 2*c*d*x + c^2))/(d^3*x^3 + 3*c*d^2*
x^2 + 3*c^2*d*x + c^3), x)
```

Fricas [A]
time = 0.39, size = 225, normalized size = 1.86

$$-\frac{F^{a} b^{3} \mathrm{Ei}\left(\frac{b \log\left(F\right)}{d^{2} x^{2} + 2 \, c d x + c^{2}}\right) \log\left(F\right)^{3} - {\left(2 \, d^{6} x^{6} + 12 \, c d^{5} x^{5} + 30 \, c^{2} d^{4} x^{4} + 40 \, c^{3} d^{3} x^{3} + 30 \, c^{4} d^{2} x^{2} + 12 \, c^{5} d x + 2 \, c^{6} + {\left(b^{2} d^{2} x^{2} + 2 \, b^{2} c d x + b^{2} c^{2}\right)} \log\left(F\right)^{2} + {\left(b d^{4} x^{4} + 4 \, b c d^{3} x^{3} + 6 \, b c^{2} d^{2} x^{2} + 4 \, b c^{3} d x + b c^{4}\right)} \log\left(F\right)\right)} F^{\frac{a d^{2} x^{2} + 2 \, a c d x + a c^{2} + b}{d^{2} x^{2} + 2 \, c d x + c^{2}}}}{12 \, d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^5,x, algorithm="fricas")
```

```
[Out] -1/12*(F^a*b^3*Ei(b*log(F)/(d^2*x^2 + 2*c*d*x + c^2))*log(F)^3 - (2*d^6*x^6
 + 12*c*d^5*x^5 + 30*c^2*d^4*x^4 + 40*c^3*d^3*x^3 + 30*c^4*d^2*x^2 + 12*c^5
*d*x + 2*c^6 + (b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(F)^2 + (b*d^4*x^4
+ 4*b*c*d^3*x^3 + 6*b*c^2*d^2*x^2 + 4*b*c^3*d*x + b*c^4)*log(F))*F^((a*d^2*
x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2)))/d
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a + \frac{b}{\left(c + d x\right)^{2}}} \left(c + d x\right)^{5}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)*(d*x+c)**5,x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**2)*(c + d*x)**5, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^5,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^5*F^(a + b/(d*x + c)^2), x)
```

Mupad [B]
time = 3.78, size = 92, normalized size = 0.76

$$\frac{F^a\,b^3\ln\left(F\right)^3\,\left(\frac{\mathrm{expint}\left(-\frac{b\,\ln(F)}{(c+d\,x)^2}\right)}{6}+F^{\frac{b}{(c+d\,x)^2}}\,\left(\frac{(c+d\,x)^2}{6\,b\,\ln(F)}+\frac{(c+d\,x)^4}{6\,b^2\ln(F)^2}+\frac{(c+d\,x)^6}{3\,b^3\ln(F)^3}\right)\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)*(c + d*x)^5,x)
```

```
[Out] (F^a*b^3*log(F)^3*(expint(-(b*log(F))/(c + d*x)^2)/6 + F^(b/(c + d*x)^2)*((
c + d*x)^2/(6*b*log(F)) + (c + d*x)^4/(6*b^2*log(F)^2) + (c + d*x)^6/(3*b^3
*log(F)^3))))/(2*d)
```

3.318 $\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\,dx$

Optimal. Leaf size=87

$$\frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^4}{4d}+\frac{bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^2\log(F)}{4d}-\frac{b^2F^a\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)\log^2(F)}{4d}$$

```
[Out] 1/4*F^(a+b/(d*x+c)^2)*(d*x+c)^4/d+1/4*b*F^(a+b/(d*x+c)^2)*(d*x+c)^2*ln(F)/d
-1/4*b^2*F^a*Ei(b*ln(F)/(d*x+c)^2)*ln(F)^2/d
```

Rubi [A]
time = 0.08, antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2245, 2241}

$$-\frac{b^2F^a\log^2(F)\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)}{4d}+\frac{(c+dx)^4F^{a+\frac{b}{(c+dx)^2}}}{4d}+\frac{b\log(F)(c+dx)^2F^{a+\frac{b}{(c+dx)^2}}}{4d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)*(c + d*x)^3,x]
```

```
[Out] (F^(a + b/(c + d*x)^2)*(c + d*x)^4)/(4*d) + (b*F^(a + b/(c + d*x)^2)*(c + d
*x)^2*Log[F])/(4*d) - (b^2*F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)^2]*Log[F]
^2)/(4*d)
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\,dx = \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^4}{4d} + \frac{1}{2}(b\log(F))\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)\,dx$$

$$= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^4}{4d} + \frac{bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^2\log(F)}{4d} + \frac{1}{2}\left(b^2\log^2(F)\right)\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{c+dx}$$

$$= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^4}{4d} + \frac{bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^2\log(F)}{4d} - \frac{b^2F^a\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)\log^2(F)}{4d}$$

Mathematica [A]
time = 0.03, size = 71, normalized size = 0.82

$$\frac{F^a\left(F^{\frac{b}{(c+dx)^2}}(c+dx)^4 + b\log(F)\left(F^{\frac{b}{(c+dx)^2}}(c+dx)^2 - b\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)\log(F)\right)\right)}{4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)*(c + d*x)^3,x]
```

```
[Out] (F^a*(F^(b/(c + d*x)^2)*(c + d*x)^4 + b*Log[F]*(F^(b/(c + d*x)^2)*(c + d*x)
^2 - b*ExpIntegralEi[(b*Log[F])/(c + d*x)^2]*Log[F])))/(4*d)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 207 vs. $2(81) = 162$.
time = 0.10, size = 208, normalized size = 2.39

method	result
risch	$\frac{F^a d^3 F^{\frac{b}{(dx+c)^2}} x^4}{4} + F^a d^2 F^{\frac{b}{(dx+c)^2}} c x^3 + \frac{3F^a d F^{\frac{b}{(dx+c)^2}} c^2 x^2}{2} + F^a F^{\frac{b}{(dx+c)^2}} c^3 x + \frac{F^a F^{\frac{b}{(dx+c)^2}} c^4}{4d} + \frac{F^a d b \ln(F) F^{(d}}{4}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^2)*(d*x+c)^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/4*F^a*d^3*F^(b/(d*x+c)^2)*x^4+F^a*d^2*F^(b/(d*x+c)^2)*c*x^3+3/2*F^a*d*F^(
b/(d*x+c)^2)*c^2*x^2+F^a*F^(b/(d*x+c)^2)*c^3*x+1/4*F^a/d*F^(b/(d*x+c)^2)*c^
4+1/4*F^a*d*b*ln(F)*F^(b/(d*x+c)^2)*x^2+1/2*F^a*b*ln(F)*F^(b/(d*x+c)^2)*c*x
+1/4*F^a/d*b*ln(F)*F^(b/(d*x+c)^2)*c^2+1/4*F^a/d*b^2*ln(F)^2*Ei(1,-b*ln(F)/
(d*x+c)^2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] 1/4*(F^a*d^3*x^4 + 4*F^a*c*d^2*x^3 + (6*F^a*c^2*d + F^a*b*d*log(F))*x^2 + 2
*(2*F^a*c^3 + F^a*b*c*log(F))*x)*F^(b/(d^2*x^2 + 2*c*d*x + c^2)) + integrat
e(1/2*(F^a*b^2*d^2*x^2*log(F)^2 + 2*F^a*b^2*c*d*x*log(F)^2 - F^a*b*c^4*log(
F))*F^(b/(d^2*x^2 + 2*c*d*x + c^2))/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^
3), x)
```

Fricas [A]
time = 0.44, size = 145, normalized size = 1.67

$$-\frac{F^a b^2 \mathrm{Ei}\left(\frac{b\log(F)}{d^2x^2+2\,cdx+c^2}\right)\log\left(F\right)^2-\left(d^4x^4+4\,cd^3x^3+6\,c^2d^2x^2+4\,c^3dx+c^4+\left(bd^2x^2+2\,bcdx+bc^2\right)\log\left(F\right)\right)F^{\frac{ad^2x^2+2\,acdx+ac^2+b}{d^2x^2+2\,cdx+c^2}}}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] -1/4*(F^a*b^2*Ei(b*log(F)/(d^2*x^2 + 2*c*d*x + c^2))*log(F)^2 - (d^4*x^4 +
4*c*d^3*x^3 + 6*c^2*d^2*x^2 + 4*c^3*d*x + c^4 + (b*d^2*x^2 + 2*b*c*d*x + b*
c^2)*log(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^
2)))/d
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(c+dx)^2}}\left(c+dx\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)*(d*x+c)**3,x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**2)*(c + d*x)**3, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^3,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^3*F^(a + b/(d*x + c)^2), x)
```

Mupad [B]
time = 3.70, size = 76, normalized size = 0.87

$$\frac{F^a\,b^2\ln\left(F\right)^2\left(\frac{\mathrm{expint}\left(-\frac{b\,\ln(F)}{(c+d\,x)^2}\right)}{2}+F^{\frac{b}{(c+d\,x)^2}}\left(\frac{(c+d\,x)^2}{2\,b\,\ln(F)}+\frac{(c+d\,x)^4}{2\,b^2\ln(F)^2}\right)\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)*(c + d*x)^3,x)
```

```
[Out] (F^a*b^2*log(F)^2*(expint(-(b*log(F))/(c + d*x)^2)/2 + F^(b/(c + d*x)^2)*((
c + d*x)^2/(2*b*log(F)) + (c + d*x)^4/(2*b^2*log(F)^2))))/(2*d)
```

3.319 $\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)\,dx$

Optimal. Leaf size=53

$$\frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^2}{2d}-\frac{bF^a\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)\log(F)}{2d}$$

```
[Out] 1/2*F^(a+b/(d*x+c)^2)*(d*x+c)^2/d-1/2*b*F^a*Ei(b*ln(F)/(d*x+c)^2)*ln(F)/d
```

Rubi [A]
time = 0.05, antiderivative size = 53, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2245, 2241}

$$\frac{(c+dx)^2F^{a+\frac{b}{(c+dx)^2}}}{2d}-\frac{bF^a\log(F)\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)*(c + d*x),x]
```

```
[Out] (F^(a + b/(c + d*x)^2)*(c + d*x)^2)/(2*d) - (b*F^a*ExpIntegralEi[(b*Log[F])
/(c + d*x)^2]*Log[F])/(2*d)
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)\,dx&=\frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^2}{2d}+(b\log(F))\int\frac{F^{a+\frac{b}{(c+dx)^2}}}{c+dx}\,dx\\&=\frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^2}{2d}-\frac{bF^a\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)\log(F)}{2d}\end{aligned}$$

Mathematica [A]
time = 0.02, size = 47, normalized size = 0.89

$$\frac{F^a\left(F^{\frac{b}{(c+dx)^2}}(c+dx)^2-b\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)\log(F)\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)*(c + d*x),x]
```

```
[Out] (F^a*(F^(b/(c + d*x)^2)*(c + d*x)^2 - b*ExpIntegralEi[(b*Log[F])/(c + d*x)^
2]*Log[F]))/(2*d)
```

Maple [A]
time = 0.03, size = 86, normalized size = 1.62

method	result	size
risch	$\frac{d\,F^a F^{\frac{b}{(dx+c)^2}}x^2}{2}+F^a F^{\frac{b}{(dx+c)^2}}cx+\frac{F^a F^{\frac{b}{(dx+c)^2}}c^2}{2d}+\frac{F^a b\ln(F)\,\text{expIntegral}\left(1,-\frac{b\ln(F)}{(dx+c)^2}\right)}{2d}$	86

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^2)*(d*x+c),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*d*F^a*F^(b/(d*x+c)^2)*x^2+F^a*F^(b/(d*x+c)^2)*c*x+1/2/d*F^a*F^(b/(d*x+c
)^2)*c^2+1/2/d*F^a*b*ln(F)*Ei(1,-b*ln(F)/(d*x+c)^2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c),x, algorithm="maxima")
```

```
[Out] 1/2*(F^a*d*x^2 + 2*F^a*c*x)*F^(b/(d^2*x^2 + 2*c*d*x + c^2)) + integrate((F^
a*b*d^2*x^2*log(F) + 2*F^a*b*c*d*x*log(F))*F^(b/(d^2*x^2 + 2*c*d*x + c^2))/
(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3), x)
```

Fricas [A]
time = 0.43, size = 96, normalized size = 1.81

$$-\frac{F^a b\text{Ei}\left(\frac{b\log(F)}{d^2x^2+2\,cdx+c^2}\right)\log\left(F\right)-\left(d^2x^2+2\,cdx+c^2\right)F^{\frac{ad^2x^2+2\,acdx+ac^2+b}{d^2x^2+2\,cdx+c^2}}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c),x, algorithm="fricas")
```

```
[Out] -1/2*(F^a*b*Ei(b*log(F)/(d^2*x^2 + 2*c*d*x + c^2))*log(F) - (d^2*x^2 + 2*c*
d*x + c^2)*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2)
))/d
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)*(d*x+c),x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**2)*(c + d*x), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)*F^(a + b/(d*x + c)^2), x)
```

Mupad [B]
time = 5.45, size = 51, normalized size = 0.96

$$\frac{F^a\,F^{\frac{b}{(c+d\,x)^2}}\,(c+d\,x)^2}{2\,d}+\frac{F^a\,b\,\ln(F)\,\mathrm{expint}\left(-\frac{b\,\ln(F)}{(c+d\,x)^2}\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)*(c + d*x),x)
```

```
[Out] (F^a*F^(b/(c + d*x)^2)*(c + d*x)^2)/(2*d) + (F^a*b*log(F)*expint(-(b*log(F)
)/(c + d*x)^2))/(2*d)
```

3.320 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{c+dx}\,dx$

Optimal. Leaf size=22

$$-\frac{F^a \text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

```
[Out] -1/2*F^a*Ei(b*ln(F)/(d*x+c)^2)/d
```

Rubi [A]
time = 0.03, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2241}

$$-\frac{F^a \text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x),x]
```

```
[Out] -1/2*(F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)^2])/d
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{c+dx}\,dx = -\frac{F^a \text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

Mathematica [A]
time = 0.01, size = 22, normalized size = 1.00

$$-\frac{F^a \text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x),x]
```

[Out] -1/2*(F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)^2])/d

Maple [A]
time = 0.07, size = 23, normalized size = 1.05

method	result	size
risch	$\frac{F^a \operatorname{expIntegral}\left(1,-\frac{b \ln(F)}{(dx+c)^2}\right)}{2d}$	23

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a+b/(d*x+c)^2)/(d*x+c),x,method=_RETURNVERBOSE)

[Out] 1/2/d*F^a*Ei(1,-b*ln(F)/(d*x+c)^2)

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c),x, algorithm="maxima")

[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c), x)

Fricas [A]
time = 0.36, size = 31, normalized size = 1.41

$$-\frac{F^a \operatorname{Ei}\left(\frac{b \log(F)}{d^2x^2+2\,cdx+c^2}\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c),x, algorithm="fricas")

[Out] -1/2*F^a*Ei(b*log(F)/(d^2*x^2 + 2*c*d*x + c^2))/d

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{c+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c),x)

[Out] Integral(F**(a + b/(c + d*x)**2)/(c + d*x), x)

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c),x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c), x)
```

Mupad [B]
time = 3.70, size = 20, normalized size = 0.91

$$-\frac{F^a\,\mathrm{ei}\left(\frac{b\,\ln(F)}{(c+d\,x)^2}\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x),x)
```

```
[Out] -(F^a*ei((b*log(F))/(c + d*x)^2))/(2*d)
```

3.321 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^3}\,dx$

Optimal. Leaf size=27

$$-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)}$$

```
[Out] -1/2*F^(a+b/(d*x+c)^2)/b/d/ln(F)
```

Rubi [A]
time = 0.03, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2240}

$$-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^3,x]
```

```
[Out] -1/2*F^(a + b/(c + d*x)^2)/(b*d*Log[F])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^3}\,dx = -\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)}$$

Mathematica [A]
time = 0.01, size = 27, normalized size = 1.00

$$-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^3,x]
```

[Out] -1/2*F^(a + b/(c + d*x)^2)/(b*d*Log[F])

Maple [A]
time = 0.06, size = 26, normalized size = 0.96

method	result	size
derivativedivides	$-\frac{F^{a+\frac{b}{(dx+c)^{2}}}}{2bd\ln(F)}$	26
default	$-\frac{F^{a+\frac{b}{(dx+c)^{2}}}}{2bd\ln(F)}$	26
risch	$-\frac{F^{\frac{a\,d^{2}x^{2}+2acdx+a\,c^{2}+b}{(dx+c)^{2}}}}{2bd\ln(F)}$	44
norman	$\frac{-\frac{c^{2}{\mathrm e}^{\left(a+\frac{b}{(dx+c)^{2}}\right)\ln(F)}}{2\ln(F)bd}-\frac{cx\,{\mathrm e}^{\left(a+\frac{b}{(dx+c)^{2}}\right)\ln(F)}}{\ln(F)b}-\frac{d\,x^{2}{\mathrm e}^{\left(a+\frac{b}{(dx+c)^{2}}\right)\ln(F)}}{2\ln(F)b}}{(dx+c)^{2}}$	94

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a+b/(d*x+c)^2)/(d*x+c)^3,x,method=_RETURNVERBOSE)

[Out] -1/2*F^(a+b/(d*x+c)^2)/b/d/ln(F)

Maxima [A]
time = 0.29, size = 25, normalized size = 0.93

$$-\frac{F^{a+\frac{b}{(dx+c)^{2}}}}{2\,bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^3,x, algorithm="maxima")

[Out] -1/2*F^(a + b/(d*x + c)^2)/(b*d*log(F))

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 54 vs. 2(25) = 50.
time = 0.38, size = 54, normalized size = 2.00

$$-\frac{F^{\frac{ad^{2}x^{2}+2\,acdx+ac^{2}+b}{d^{2}x^{2}+2\,cdx+c^{2}}}}{2\,bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^3,x, algorithm="fricas")

[Out] -1/2*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2))/(b*d*log(F))

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 53 vs. $2(20) = 40$.
time = 0.13, size = 53, normalized size = 1.96

$$\begin{cases} -\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log{(F)}} & \text{for } bd\log{(F)} \neq 0 \\ -\frac{1}{2c^2d+4cd^2x+2d^3x^2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**3,x)
```

```
[Out] Piecewise((-F**(a + b/(c + d*x)**2)/(2*b*d*log(F)), Ne(b*d*log(F), 0)), (-1
/(2*c**2*d + 4*c*d**2*x + 2*d**3*x**2), True))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 54 vs. $2(25) = 50$.
time = 1.95, size = 54, normalized size = 2.00

$$-\frac{F^{\frac{ad^2x^2+2\,acdx+ac^2+b}{d^2x^2+2\,cdx+c^2}}}{2\,bd\log{(F)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^3,x, algorithm="giac")
```

```
[Out] -1/2*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2))/(b*d
*log(F))
```

Mupad [B]
time = 3.54, size = 37, normalized size = 1.37

$$-\frac{F^a\,F^{\frac{b}{c^2+2\,c\,d\,x+d^2\,x^2}}}{2\,b\,d\,\ln{(F)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^3,x)
```

```
[Out] -(F^a*F^(b/(c^2 + d^2*x^2 + 2*c*d*x)))/(2*b*d*log(F))
```

3.322 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^5} dx$

Optimal. Leaf size=62

$$\frac{F^{a+\frac{b}{(c+dx)^2}}}{2b^2d\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^2\log(F)}$$

```
[Out] 1/2*F^(a+b/(d*x+c)^2)/b^2/d/ln(F)^2-1/2*F^(a+b/(d*x+c)^2)/b/d/(d*x+c)^2/ln(
F)
```

Rubi [A]
time = 0.06, antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2243, 2240}

$$\frac{F^{a+\frac{b}{(c+dx)^2}}}{2b^2d\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^5,x]
```

```
[Out] F^(a + b/(c + d*x)^2)/(2*b^2*d*Log[F]^2) - F^(a + b/(c + d*x)^2)/(2*b*d*(c
+ d*x)^2*Log[F])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^5}\,dx = -\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^2\log(F)} - \frac{\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^3}\,dx}{b\log(F)}$$
$$= \frac{F^{a+\frac{b}{(c+dx)^2}}}{2b^2d\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^2\log(F)}$$

Mathematica [A]
time = 0.02, size = 47, normalized size = 0.76

$$\frac{F^{a+\frac{b}{(c+dx)^2}}\left((c+dx)^2-b\log(F)\right)}{2b^2d(c+dx)^2\log^2(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^5,x]
```

```
[Out] (F^(a + b/(c + d*x)^2)*((c + d*x)^2 - b*Log[F]))/(2*b^2*d*(c + d*x)^2*Log[F
]^2)
```

Maple [A]
time = 0.06, size = 74, normalized size = 1.19

method	result
risch	$-\frac{\left(-d^2x^2-2cdx+b\ln(F)-c^2\right)F^{\frac{a\,d^2x^2+2acdx+a\,c^2+b}{(dx+c)^2}}}{2d\ln(F)^2b^2(dx+c)^2}$
norman	$\frac{\frac{d^3x^4\mathrm{e}^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{2\ln(F)^2b^2}-\frac{c\left(b\ln(F)-2c^2\right)x\,\mathrm{e}^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{\ln(F)^2b^2}-\frac{c^2\left(b\ln(F)-c^2\right)\mathrm{e}^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{2d\ln(F)^2b^2}-\frac{d\left(b\ln(F)-6c^2\right)x^2\mathrm{e}^{\left(a+\frac{b}{(dx+c)^2}\right.}}{2\ln(F)^2b^2}}{(dx+c)^4}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^2)/(d*x+c)^5,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*(-d^2*x^2-2*c*d*x+b*ln(F)-c^2)/d/ln(F)^2/b^2/(d*x+c)^2*F^((a*d^2*x^2+2
*a*c*d*x+a*c^2+b)/(d*x+c)^2)
```

Maxima [A]
time = 0.28, size = 101, normalized size = 1.63

$$\frac{\left(F^ad^2x^2+2\,F^acdx+F^ac^2-F^ab\log\left(F\right)\right)F^{\frac{b}{d^2x^2+2\,cdx+c^2}}}{2\,\left(b^2d^3x^2\log\left(F\right)^2+2\,b^2cd^2x\log\left(F\right)^2+b^2c^2d\log\left(F\right)^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^5,x, algorithm="maxima")
```

```
[Out] 1/2*(F^a*d^2*x^2 + 2*F^a*c*d*x + F^a*c^2 - F^a*b*log(F))*F^(b/(d^2*x^2 + 2*
c*d*x + c^2))/(b^2*d^3*x^2*log(F)^2 + 2*b^2*c*d^2*x*log(F)^2 + b^2*c^2*d*lo
g(F)^2)
```

Fricas [A]
time = 0.37, size = 100, normalized size = 1.61

$$\frac{(d^2x^2 + 2\,cdx + c^2 - b\log(F))F^{\frac{ad^2x^2 + 2\,acdx + ac^2 + b}{d^2x^2 + 2\,cdx + c^2}}}{2\,(b^2d^3x^2 + 2\,b^2cd^2x + b^2c^2d)\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^5,x, algorithm="fricas")
```

```
[Out] 1/2*(d^2*x^2 + 2*c*d*x + c^2 - b*log(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2
+ b)/(d^2*x^2 + 2*c*d*x + c^2))/((b^2*d^3*x^2 + 2*b^2*c*d^2*x + b^2*c^2*d)*
log(F)^2)
```

Sympy [A]
time = 0.12, size = 82, normalized size = 1.32

$$\frac{F^{a+\frac{b}{(c+dx)^2}}(-b\log(F) + c^2 + 2cdx + d^2x^2)}{2b^2c^2d\log(F)^2 + 4b^2cd^2x\log(F)^2 + 2b^2d^3x^2\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**5,x)
```

```
[Out] F**(a + b/(c + d*x)**2)*(-b*log(F) + c**2 + 2*c*d*x + d**2*x**2)/(2*b**2*c*
*2*d*log(F)**2 + 4*b**2*c*d**2*x*log(F)**2 + 2*b**2*d**3*x**2*log(F)**2)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^5,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^5, x)
```

Mupad [B]
time = 3.71, size = 97, normalized size = 1.56

$$\frac{F^a\,F^{\frac{b}{c^2+2\,c\,d\,x+d^2\,x^2}}\,\left(\frac{x^2}{2\,b^2\,d\ln(F)^2}-\frac{b\,\ln(F)-c^2}{2\,b^2\,d^3\,\ln(F)^2}+\frac{c\,x}{b^2\,d^2\,\ln(F)^2}\right)}{x^2+\frac{c^2}{d^2}+\frac{2\,c\,x}{d}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^5,x)
```

```
[Out] (F^a*F^(b/(c^2 + d^2*x^2 + 2*c*d*x))*(x^2/(2*b^2*d*log(F)^2) - (b*log(F) -
c^2)/(2*b^2*d^3*log(F)^2) + (c*x)/(b^2*d^2*log(F)^2)))/(x^2 + c^2/d^2 + (2*
c*x)/d)
```

3.323 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^7}\,dx$

Optimal. Leaf size=91

$$-\frac{F^{a+\frac{b}{(c+dx)^2}}}{b^3d\log^3(F)}+\frac{F^{a+\frac{b}{(c+dx)^2}}}{b^2d(c+dx)^2\log^2(F)}-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^4\log(F)}$$

```
[Out] -F^(a+b/(d*x+c)^2)/b^3/d/ln(F)^3+F^(a+b/(d*x+c)^2)/b^2/d/(d*x+c)^2/ln(F)^2-
1/2*F^(a+b/(d*x+c)^2)/b/d/(d*x+c)^4/ln(F)
```

Rubi [A]
time = 0.09, antiderivative size = 91, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2243, 2240}

$$-\frac{F^{a+\frac{b}{(c+dx)^2}}}{b^3d\log^3(F)}+\frac{F^{a+\frac{b}{(c+dx)^2}}}{b^2d\log^2(F)(c+dx)^2}-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)(c+dx)^4}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^7,x]
```

```
[Out] -(F^(a + b/(c + d*x)^2)/(b^3*d*Log[F]^3)) + F^(a + b/(c + d*x)^2)/(b^2*d*(c
 + d*x)^2*Log[F]^2) - F^(a + b/(c + d*x)^2)/(2*b*d*(c + d*x)^4*Log[F])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^7}\,dx = -\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^4\log(F)} - \frac{2\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^5}\,dx}{b\log(F)}$$
$$= \frac{F^{a+\frac{b}{(c+dx)^2}}}{b^2d(c+dx)^2\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^4\log(F)} + \frac{2\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^3}\,dx}{b^2\log^2(F)}$$
$$= -\frac{F^{a+\frac{b}{(c+dx)^2}}}{b^3d\log^3(F)} + \frac{F^{a+\frac{b}{(c+dx)^2}}}{b^2d(c+dx)^2\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^4\log(F)}$$

Mathematica [A]
time = 0.03, size = 64, normalized size = 0.70

$$-\frac{F^{a+\frac{b}{(c+dx)^2}}\left(2(c+dx)^4-2b(c+dx)^2\log(F)+b^2\log^2(F)\right)}{2b^3d(c+dx)^4\log^3(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^7,x]
```

```
[Out] -1/2*(F^(a + b/(c + d*x)^2)*(2*(c + d*x)^4 - 2*b*(c + d*x)^2*Log[F] + b^2*L
og[F]^2))/(b^3*d*(c + d*x)^4*Log[F]^3)
```

Maple [A]
time = 0.07, size = 127, normalized size = 1.40

method	result
risch	$-\frac{\left(2d^4x^4+8c\,d^3x^3-2\ln(F)b\,d^2x^2+12c^2d^2x^2-4\ln(F)bcdx+8c^3dx+\ln(F)^2b^2-2\ln(F)b\,c^2+2c^4\right)F^{\frac{a\,d^2x^2+2acdx+a\,c^2+b}{(dx+c)^2}}}{2b^3\ln(F)^3d(dx+c)^4}$
norman	$\frac{\frac{d^3\left(b\ln(F)-15c^2\right)x^4\mathrm{e}^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{\ln(F)^3b^3}-\frac{d^5x^6\mathrm{e}^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{\ln(F)^3b^3}-\frac{c\left(\ln(F)^2b^2-4\ln(F)b\,c^2+6c^4\right)x\,\mathrm{e}^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{b^3\ln(F)^3}-\frac{d\left(\ln(F)^2b^2-1\right.}{}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^2)/(d*x+c)^7,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*(2*d^4*x^4+8*c*d^3*x^3-2*ln(F)*b*d^2*x^2+12*c^2*d^2*x^2-4*ln(F)*b*c*d*
x+8*c^3*d*x+ln(F)^2*b^2-2*ln(F)*b*c^2+2*c^4)/b^3/ln(F)^3/d/(d*x+c)^4*F^((a*
d^2*x^2+2*a*c*d*x+a*c^2+b)/(d*x+c)^2)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 208 vs. 2(89) = 178.
time = 0.29, size = 208, normalized size = 2.29

$$-\frac{\left(2\,F^a d^4x^4+8\,F^a cd^3x^3+2\,F^a c^4-2\,F^a bc^2\log(F)+F^a b^2\log(F)^2+2\,(6\,F^a c^2d^2-F^a bd^2\log(F))x^2+4\,(2\,F^a c^3d-F^a bcd\log(F))x\right)F^{\frac{b}{d^2x^2+2\,cdx+c^2}}}{2\,\left(b^3d^5x^4\log(F)^3+4\,b^3cd^4x^3\log(F)^3+6\,b^3c^2d^3x^2\log(F)^3+4\,b^3c^3d^2x\log(F)^3+b^3c^4d\log(F)^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^7,x, algorithm="maxima")
```

```
[Out] -1/2*(2*F^a*d^4*x^4 + 8*F^a*c*d^3*x^3 + 2*F^a*c^4 - 2*F^a*b*c^2*log(F) + F^
a*b^2*log(F)^2 + 2*(6*F^a*c^2*d^2 - F^a*b*d^2*log(F))*x^2 + 4*(2*F^a*c^3*d
- F^a*b*c*d*log(F))*x)*F^(b/(d^2*x^2 + 2*c*d*x + c^2))/(b^3*d^5*x^4*log(F)^
3 + 4*b^3*c*d^4*x^3*log(F)^3 + 6*b^3*c^2*d^3*x^2*log(F)^3 + 4*b^3*c^3*d^2*x
*log(F)^3 + b^3*c^4*d*log(F)^3)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 180 vs. $2(89) = 178$.
time = 0.37, size = 180, normalized size = 1.98

$$-\frac{\left(2\,d^4x^4+8\,cd^3x^3+12\,c^2d^2x^2+8\,c^3dx+2\,c^4+b^2\log\left(F\right)^2-2\left(bd^2x^2+2\,bcdx+bc^2\right)\log\left(F\right)\right)F^{\frac{ad^2x^2+2\,acdx+ac^2+b}{d^2x^2+2\,cdx+c^2}}}{2\left(b^3d^5x^4+4\,b^3cd^4x^3+6\,b^3c^2d^3x^2+4\,b^3c^3d^2x+b^3c^4d\right)\log\left(F\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^7,x, algorithm="fricas")
```

```
[Out] -1/2*(2*d^4*x^4 + 8*c*d^3*x^3 + 12*c^2*d^2*x^2 + 8*c^3*d*x + 2*c^4 + b^2*lo
g(F)^2 - 2*(b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F))*F^((a*d^2*x^2 + 2*a*c*d*
x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2))/((b^3*d^5*x^4 + 4*b^3*c*d^4*x^3 +
 6*b^3*c^2*d^3*x^2 + 4*b^3*c^3*d^2*x + b^3*c^4*d)*log(F)^3)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 189 vs. $2(76) = 152$.
time = 0.16, size = 189, normalized size = 2.08

$$\frac{F^{a+\frac{b}{(c+dx)^2}}\left(-b^2\log\left(F\right)^2+2bc^2\log\left(F\right)+4bcdx\log\left(F\right)+2bd^2x^2\log\left(F\right)-2c^4-8c^3dx-12c^2d^2x^2-8cd^3x^3-2d^4x^4\right)}{2b^3c^4d\log\left(F\right)^3+8b^3c^3d^2x\log\left(F\right)^3+12b^3c^2d^3x^2\log\left(F\right)^3+8b^3cd^4x^3\log\left(F\right)^3+2b^3d^5x^4\log\left(F\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**7,x)
```

```
[Out] F**(a + b/(c + d*x)**2)*(-b**2*log(F)**2 + 2*b*c**2*log(F) + 4*b*c*d*x*log(
F) + 2*b*d**2*x**2*log(F) - 2*c**4 - 8*c**3*d*x - 12*c**2*d**2*x**2 - 8*c*d
**3*x**3 - 2*d**4*x**4)/(2*b**3*c**4*d*log(F)**3 + 8*b**3*c**3*d**2*x*log(F
)**3 + 12*b**3*c**2*d**3*x**2*log(F)**3 + 8*b**3*c*d**4*x**3*log(F)**3 + 2*
b**3*d**5*x**4*log(F)**3)
```

Giac [C] Result contains complex when optimal does not.
time = 2.72, size = 1703, normalized size = 18.71

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^7,x, algorithm="giac")

[Out] -1/2*((2*(pi^3*b^3*d^3*sgn(F) - 3*pi*b^3*d^3*log(abs(F))^2*sgn(F) - pi^3*b^
3*d^3 + 3*pi*b^3*d^3*log(abs(F))^2)*(pi*b*d^2*sgn(F)/(d*x + c)^2 - pi*b^2*d
^2*log(abs(F))*sgn(F)/(d*x + c)^4 - pi*b*d^2/(d*x + c)^2 + pi*b^2*d^2*log(a
bs(F))/(d*x + c)^4)/((pi^3*b^3*d^3*sgn(F) - 3*pi*b^3*d^3*log(abs(F))^2*sgn(
F) - pi^3*b^3*d^3 + 3*pi*b^3*d^3*log(abs(F))^2)^2 + (3*pi^2*b^3*d^3*log(abs
(F))*sgn(F) - 3*pi^2*b^3*d^3*log(abs(F)) + 2*b^3*d^3*log(abs(F))^3)^2) + (3
*pi^2*b^3*d^3*log(abs(F))*sgn(F) - 3*pi^2*b^3*d^3*log(abs(F)) + 2*b^3*d^3*l
og(abs(F))^3)*(pi^2*b^2*d^2*sgn(F)/(d*x + c)^4 - pi^2*b^2*d^2/(d*x + c)^4 +
 4*d^2 - 4*b*d^2*log(abs(F))/(d*x + c)^2 + 2*b^2*d^2*log(abs(F))^2/(d*x + c
)^4)/((pi^3*b^3*d^3*sgn(F) - 3*pi*b^3*d^3*log(abs(F))^2*sgn(F) - pi^3*b^3*d
^3 + 3*pi*b^3*d^3*log(abs(F))^2)^2 + (3*pi^2*b^3*d^3*log(abs(F))*sgn(F) - 3
*pi^2*b^3*d^3*log(abs(F)) + 2*b^3*d^3*log(abs(F))^3)^2))*cos(-1/2*pi*a*sgn(
F) + 1/2*pi*a - 1/2*pi*b*sgn(F)/(d^2*x^2 + 2*c*d*x + c^2) + 1/2*pi*b/(d^2*x
^2 + 2*c*d*x + c^2)) - (2*(3*pi^2*b^3*d^3*log(abs(F))*sgn(F) - 3*pi^2*b^3*d
^3*log(abs(F)) + 2*b^3*d^3*log(abs(F))^3)*(pi*b*d^2*sgn(F)/(d*x + c)^2 - pi
*b^2*d^2*log(abs(F))*sgn(F)/(d*x + c)^4 - pi*b*d^2/(d*x + c)^2 + pi*b^2*d^2
*log(abs(F))/(d*x + c)^4)/((pi^3*b^3*d^3*sgn(F) - 3*pi*b^3*d^3*log(abs(F))^
2*sgn(F) - pi^3*b^3*d^3 + 3*pi*b^3*d^3*log(abs(F))^2)^2 + (3*pi^2*b^3*d^3*l
og(abs(F))*sgn(F) - 3*pi^2*b^3*d^3*log(abs(F)) + 2*b^3*d^3*log(abs(F))^3)^2
) - (pi^3*b^3*d^3*sgn(F) - 3*pi*b^3*d^3*log(abs(F))^2*sgn(F) - pi^3*b^3*d^3
 + 3*pi*b^3*d^3*log(abs(F))^2)*(pi^2*b^2*d^2*sgn(F)/(d*x + c)^4 - pi^2*b^2*
d^2/(d*x + c)^4 + 4*d^2 - 4*b*d^2*log(abs(F))/(d*x + c)^2 + 2*b^2*d^2*log(a
bs(F))^2/(d*x + c)^4)/((pi^3*b^3*d^3*sgn(F) - 3*pi*b^3*d^3*log(abs(F))^2*sg
n(F) - pi^3*b^3*d^3 + 3*pi*b^3*d^3*log(abs(F))^2)^2 + (3*pi^2*b^3*d^3*log(a
bs(F))*sgn(F) - 3*pi^2*b^3*d^3*log(abs(F)) + 2*b^3*d^3*log(abs(F))^3)^2))*s
in(-1/2*pi*a*sgn(F) + 1/2*pi*a - 1/2*pi*b*sgn(F)/(d^2*x^2 + 2*c*d*x + c^2)
+ 1/2*pi*b/(d^2*x^2 + 2*c*d*x + c^2)))*e^(a*log(abs(F)) + b*log(abs(F))/(d*
x + c)^2) + I*((2*pi*b*d^2*sgn(F)/(d*x + c)^2 + I*pi^2*b^2*d^2*sgn(F)/(d*x
+ c)^4 - 2*pi*b^2*d^2*log(abs(F))*sgn(F)/(d*x + c)^4 - 2*pi*b*d^2/(d*x + c)
^2 - I*pi^2*b^2*d^2/(d*x + c)^4 + 4*I*d^2 - 4*I*b*d^2*log(abs(F))/(d*x + c)
^2 + 2*pi*b^2*d^2*log(abs(F))/(d*x + c)^4 + 2*I*b^2*d^2*log(abs(F))^2/(d*x
+ c)^4)*e^(1/2*I*pi*a*sgn(F) - 1/2*I*pi*a + 1/2*I*pi*b*sgn(F)/(d^2*x^2 + 2*
c*d*x + c^2) - 1/2*I*pi*b/(d^2*x^2 + 2*c*d*x + c^2))/(4*I*pi^3*b^3*d^3*sgn(
F) - 12*pi^2*b^3*d^3*log(abs(F))*sgn(F) - 12*I*pi*b^3*d^3*log(abs(F))^2*sgn
(F) - 4*I*pi^3*b^3*d^3 + 12*pi^2*b^3*d^3*log(abs(F)) + 12*I*pi*b^3*d^3*log(
abs(F))^2 - 8*b^3*d^3*log(abs(F))^3) + (2*pi*b*d^2*sgn(F)/(d*x + c)^2 - I*p
i^2*b^2*d^2*sgn(F)/(d*x + c)^4 - 2*pi*b^2*d^2*log(abs(F))*sgn(F)/(d*x + c)^
4 - 2*pi*b*d^2/(d*x + c)^2 + I*pi^2*b^2*d^2/(d*x + c)^4 - 4*I*d^2 + 4*I*b*d
^2*log(abs(F))/(d*x + c)^2 + 2*pi*b^2*d^2*log(abs(F))/(d*x + c)^4 - 2*I*b^2
*d^2*log(abs(F))^2/(d*x + c)^4)*e^(-1/2*I*pi*a*sgn(F) + 1/2*I*pi*a - 1/2*I*
pi*b*sgn(F)/(d^2*x^2 + 2*c*d*x + c^2) + 1/2*I*pi*b/(d^2*x^2 + 2*c*d*x + c^2
))/(-4*I*pi^3*b^3*d^3*sgn(F) - 12*pi^2*b^3*d^3*log(abs(F))*sgn(F) + 12*I*pi
*b^3*d^3*log(abs(F))^2*sgn(F) + 4*I*pi^3*b^3*d^3 + 12*pi^2*b^3*d^3*log(abs(
```

```
F)) - 12*I*pi*b^3*d^3*log(abs(F))^2 - 8*b^3*d^3*log(abs(F))^3))*e^(a*log(ab
s(F)) + b*log(abs(F))/(d*x + c)^2)
```

Mupad [B]
time = 3.96, size = 183, normalized size = 2.01

$$-\frac{F^a F^{\frac{b}{c^2+2\,c\,d\,x+d^2\,x^2}}\left(\frac{x^4}{b^3\,d\ln(F)^3}+\frac{b^2\ln(F)^2-2\,b\,c^2\,\ln(F)+2\,c^4}{2\,b^3\,d^5\ln(F)^3}+\frac{4\,c\,x^3}{b^3\,d^2\ln(F)^3}-\frac{x^2\,\left(b\,\ln(F)-6\,c^2\right)}{b^3\,d^3\ln(F)^3}-\frac{2\,c\,x\,\left(b\,\ln(F)-2\,c^2\right)}{b^3\,d^4\ln(F)^3}\right)}{x^4+\frac{c^4}{d^4}+\frac{4\,c\,x^3}{d}+\frac{4\,c^3\,x}{d^3}+\frac{6\,c^2\,x^2}{d^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^7,x)
```

```
[Out] -(F^a*F^(b/(c^2 + d^2*x^2 + 2*c*d*x))*(x^4/(b^3*d*log(F)^3) + (b^2*log(F)^2
 + 2*c^4 - 2*b*c^2*log(F))/(2*b^3*d^5*log(F)^3) + (4*c*x^3)/(b^3*d^2*log(F)
^3) - (x^2*(b*log(F) - 6*c^2))/(b^3*d^3*log(F)^3) - (2*c*x*(b*log(F) - 2*c^
2))/(b^3*d^4*log(F)^3)))/(x^4 + c^4/d^4 + (4*c*x^3)/d + (4*c^3*x)/d^3 + (6*
c^2*x^2)/d^2)
```

3.324 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^9} dx$

Optimal. Leaf size=126

$$\frac{3F^{a+\frac{b}{(c+dx)^2}}}{b^4 d\log^4(F)} - \frac{3F^{a+\frac{b}{(c+dx)^2}}}{b^3 d(c+dx)^2\log^3(F)} + \frac{3F^{a+\frac{b}{(c+dx)^2}}}{2b^2 d(c+dx)^4\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^6\log(F)}$$

```
[Out] 3*F^(a+b/(d*x+c)^2)/b^4/d/ln(F)^4-3*F^(a+b/(d*x+c)^2)/b^3/d/(d*x+c)^2/ln(F)
^3+3/2*F^(a+b/(d*x+c)^2)/b^2/d/(d*x+c)^4/ln(F)^2-1/2*F^(a+b/(d*x+c)^2)/b/d/
(d*x+c)^6/ln(F)
```

Rubi [A]

time = 0.13, antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2243, 2240}

$$\frac{3F^{a+\frac{b}{(c+dx)^2}}}{b^4 d\log^4(F)} - \frac{3F^{a+\frac{b}{(c+dx)^2}}}{b^3 d\log^3(F)(c+dx)^2} + \frac{3F^{a+\frac{b}{(c+dx)^2}}}{2b^2 d\log^2(F)(c+dx)^4} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)(c+dx)^6}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^9,x]
```

```
[Out] (3*F^(a + b/(c + d*x)^2))/(b^4*d*Log[F]^4) - (3*F^(a + b/(c + d*x)^2))/(b^3
*d*(c + d*x)^2*Log[F]^3) + (3*F^(a + b/(c + d*x)^2))/(2*b^2*d*(c + d*x)^4*L
og[F]^2) - F^(a + b/(c + d*x)^2)/(2*b*d*(c + d*x)^6*Log[F])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^9}\,dx = -\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^6\log(F)} - \frac{3\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^7}\,dx}{b\log(F)}$$

$$= \frac{3F^{a+\frac{b}{(c+dx)^2}}}{2b^2d(c+dx)^4\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^6\log(F)} + \frac{6\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^5}\,dx}{b^2\log^2(F)}$$

$$= -\frac{3F^{a+\frac{b}{(c+dx)^2}}}{b^3d(c+dx)^2\log^3(F)} + \frac{3F^{a+\frac{b}{(c+dx)^2}}}{2b^2d(c+dx)^4\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^6\log(F)} - \frac{6\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^3}\,d}{b^3\log^3(F)}$$

$$= \frac{3F^{a+\frac{b}{(c+dx)^2}}}{b^4d\log^4(F)} - \frac{3F^{a+\frac{b}{(c+dx)^2}}}{b^3d(c+dx)^2\log^3(F)} + \frac{3F^{a+\frac{b}{(c+dx)^2}}}{2b^2d(c+dx)^4\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^6\log(F)}$$

Mathematica [A]
time = 0.03, size = 81, normalized size = 0.64

$$\frac{F^{a+\frac{b}{(c+dx)^2}}\left(6(c+dx)^6-6b(c+dx)^4\log(F)+3b^2(c+dx)^2\log^2(F)-b^3\log^3(F)\right)}{2b^4d(c+dx)^6\log^4(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^9,x]
```

```
[Out] (F^(a + b/(c + d*x)^2)*(6*(c + d*x)^6 - 6*b*(c + d*x)^4*Log[F] + 3*b^2*(c +
 d*x)^2*Log[F]^2 - b^3*Log[F]^3))/(2*b^4*d*(c + d*x)^6*Log[F]^4)
```

Maple [A]
time = 0.09, size = 216, normalized size = 1.71

method	result
risch	$-\frac{\left(-6d^6x^6-36cd^5x^5+6\ln(F)bd^4x^4-90c^2d^4x^4+24\ln(F)bcd^3x^3-120c^3d^3x^3-3b^2d^2x^2\ln(F)^2+36\ln(F)bc^2d^2x^2-90c^4d^2x^2-6\ln(F\right.}{2b^4\ln(F)^4d(dx+c)^6}$
norman	$\frac{\frac{3d^7x^8 e^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{\ln(F)^4b^4}-\frac{c\left(\ln(F)^3b^3-6\ln(F)^2b^2c^2+18\ln(F)bc^4-24c^6\right)x\,e^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{b^4\ln(F)^4}-\frac{d\left(\ln(F)^3b^3-18\ln(F)^2b^2c^2+90\ln(F)bc^4-1\right.}{2\ln(F)^4b^4}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^2)/(d*x+c)^9,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*(-6*d^6*x^6-36*c*d^5*x^5+6*ln(F)*b*d^4*x^4-90*c^2*d^4*x^4+24*ln(F)*b*c
*d^3*x^3-120*c^3*d^3*x^3-3*b^2*d^2*x^2*ln(F)^2+36*ln(F)*b*c^2*d^2*x^2-90*c^
4*d^2*x^2-6*ln(F)^2*b^2*c*d*x+24*ln(F)*b*c^3*d*x-36*c^5*d*x+ln(F)^3*b^3-3*l
```

```
n(F)^2*b^2*c^2+6*ln(F)*b*c^4-6*c^6)/b^4/ln(F)^4/d/(d*x+c)^6*F^((a*d^2*x^2+2
*a*c*d*x+a*c^2+b)/(d*x+c)^2)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 349 vs. $2(122) = 244$.
time = 0.30, size = 349, normalized size = 2.77

$$\frac{\left(6\,F^a d^6 x^6 + 36\,F^a c d^5 x^5 + 6\,F^a c^6 - 6\,F^a b c^4 \log\left(F\right) + 3\,F^a b^2 c^2 \log\left(F\right)^2 - F^a b^3 \log\left(F\right)^3 + 6\left(15\,F^a c^2 d^4 - F^a b d^4 \log\left(F\right)\right)x^4 + 24\left(5\,F^a c^3 d^3 - F^a b c d^3 \log\left(F\right)\right)x^3 + 3\left(30\,F^a c^4 d^2 - 12\,F^a b c^2 d^2 \log\left(F\right) + F^a b^2 d^2 \log\left(F\right)^2\right)x^2 + 6\left(6\,F^a c^5 d - 4\,F^a b c^3 d \log\left(F\right) + F^a b^2 c d \log\left(F\right)^2\right)x\right)F^{\frac{b}{d^2x^2+2\,cdx+c^2}}}{2\left(b^4 d^7 x^6 \log\left(F\right)^4 + 6\,b^4 c d^6 x^5 \log\left(F\right)^4 + 15\,b^4 c^2 d^5 x^4 \log\left(F\right)^4 + 20\,b^4 c^3 d^4 x^3 \log\left(F\right)^4 + 15\,b^4 c^4 d^3 x^2 \log\left(F\right)^4 + 6\,b^4 c^5 d^2 x \log\left(F\right)^4 + b^4 c^6 d \log\left(F\right)^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^9,x, algorithm="maxima")
```

```
[Out] 1/2*(6*F^a*d^6*x^6 + 36*F^a*c*d^5*x^5 + 6*F^a*c^6 - 6*F^a*b*c^4*log(F) + 3*
F^a*b^2*c^2*log(F)^2 - F^a*b^3*log(F)^3 + 6*(15*F^a*c^2*d^4 - F^a*b*d^4*log
(F))*x^4 + 24*(5*F^a*c^3*d^3 - F^a*b*c*d^3*log(F))*x^3 + 3*(30*F^a*c^4*d^2
- 12*F^a*b*c^2*d^2*log(F) + F^a*b^2*d^2*log(F)^2)*x^2 + 6*(6*F^a*c^5*d - 4*
F^a*b*c^3*d*log(F) + F^a*b^2*c*d*log(F)^2)*x)*F^(b/(d^2*x^2 + 2*c*d*x + c^2
))/(b^4*d^7*x^6*log(F)^4 + 6*b^4*c*d^6*x^5*log(F)^4 + 15*b^4*c^2*d^5*x^4*lo
g(F)^4 + 20*b^4*c^3*d^4*x^3*log(F)^4 + 15*b^4*c^4*d^3*x^2*log(F)^4 + 6*b^4*
c^5*d^2*x*log(F)^4 + b^4*c^6*d*log(F)^4)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 287 vs. $2(122) = 244$.
time = 0.36, size = 287, normalized size = 2.28

$$\frac{\left(6\,d^6x^6 + 36\,cd^5x^5 + 90\,c^2d^4x^4 + 120\,c^3d^3x^3 + 90\,c^4d^2x^2 + 36\,c^5dx + 6\,c^6 - b^3\log\left(F\right)^3 + 3\left(b^2d^2x^2 + 2\,b^2cdx + b^2c^2\right)\log\left(F\right)^2 - 6\left(bd^4x^4 + 4\,bcd^3x^3 + 6\,bc^2d^2x^2 + 4\,bc^3dx + bc^4\right)\log\left(F\right)\right)F^{\frac{ad^2x^2+2\,acdx+ac^2+b}{d^2x^2+2\,cdx+c^2}}}{2\left(b^4d^7x^6 + 6\,b^4cd^6x^5 + 15\,b^4c^2d^5x^4 + 20\,b^4c^3d^4x^3 + 15\,b^4c^4d^3x^2 + 6\,b^4c^5d^2x + b^4c^6d\right)\log\left(F\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^9,x, algorithm="fricas")
```

```
[Out] 1/2*(6*d^6*x^6 + 36*c*d^5*x^5 + 90*c^2*d^4*x^4 + 120*c^3*d^3*x^3 + 90*c^4*d
^2*x^2 + 36*c^5*d*x + 6*c^6 - b^3*log(F)^3 + 3*(b^2*d^2*x^2 + 2*b^2*c*d*x +
 b^2*c^2)*log(F)^2 - 6*(b*d^4*x^4 + 4*b*c*d^3*x^3 + 6*b*c^2*d^2*x^2 + 4*b*c
^3*d*x + b*c^4)*log(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2
*c*d*x + c^2))/((b^4*d^7*x^6 + 6*b^4*c*d^6*x^5 + 15*b^4*c^2*d^5*x^4 + 20*b^
4*c^3*d^4*x^3 + 15*b^4*c^4*d^3*x^2 + 6*b^4*c^5*d^2*x + b^4*c^6*d)*log(F)^4)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 333 vs. $2(112) = 224$.
time = 0.21, size = 333, normalized size = 2.64

$$\frac{F^{a+\frac{b}{(c+dx)^2}}\left(-b^3\log\left(F\right)^3 + 3b^2c^2\log\left(F\right)^2 + 6b^2cdx\log\left(F\right)^2 + 3b^2d^2x^2\log\left(F\right)^2 - 6bc^4\log\left(F\right) - 24bc^3dx\log\left(F\right) - 36bc^2d^2x^2\log\left(F\right) - 24bcd^3x^3\log\left(F\right) - 6bd^4x^4\log\left(F\right) + 6c^6 + 36c^5dx + 90c^4d^2x^2 + 120c^3d^3x^3 + 90c^2d^4x^4 + 36cd^5x^5 + 6d^6x^6\right)}{2b^4c^6d\log\left(F\right)^4 + 12b^4c^5d^2x\log\left(F\right)^4 + 30b^4c^4d^3x^2\log\left(F\right)^4 + 40b^4c^3d^4x^3\log\left(F\right)^4 + 30b^4c^2d^5x^4\log\left(F\right)^4 + 12b^4cd^6x^5\log\left(F\right)^4 + 2b^4d^7x^6\log\left(F\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**9,x)
```

```
[Out] F**(a + b/(c + d*x)**2)*(-b**3*log(F)**3 + 3*b**2*c**2*log(F)**2 + 6*b**2*c
*d*x*log(F)**2 + 3*b**2*d**2*x**2*log(F)**2 - 6*b*c**4*log(F) - 24*b*c**3*d
*x*log(F) - 36*b*c**2*d**2*x**2*log(F) - 24*b*c*d**3*x**3*log(F) - 6*b*d**4
*x**4*log(F) + 6*c**6 + 36*c**5*d*x + 90*c**4*d**2*x**2 + 120*c**3*d**3*x**
3 + 90*c**2*d**4*x**4 + 36*c*d**5*x**5 + 6*d**6*x**6)/(2*b**4*c**6*d*log(F)
**4 + 12*b**4*c**5*d**2*x*log(F)**4 + 30*b**4*c**4*d**3*x**2*log(F)**4 + 40
*b**4*c**3*d**4*x**3*log(F)**4 + 30*b**4*c**2*d**5*x**4*log(F)**4 + 12*b**4
*c*d**6*x**5*log(F)**4 + 2*b**4*d**7*x**6*log(F)**4)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^9,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^9, x)
```

Mupad [B]
time = 4.25, size = 292, normalized size = 2.32

$$\frac{F^a\,F^{\frac{b}{c^2+2\,c\,d\,x+d^2\,x^2}}\,\left(\frac{3\,x^6}{b^4\,d\,\ln(F)^4}-\frac{b^3\,\ln(F)^3-3\,b^2\,c^2\,\ln(F)^2+6\,b\,c^4\,\ln(F)-6\,c^6}{2\,b^4\,d^7\,\ln(F)^4}+\frac{18\,c\,x^5}{b^4\,d^2\,\ln(F)^4}+\frac{3\,x^2\,\left(b^2\,\ln(F)^2-12\,b\,c^2\,\ln(F)+30\,c^4\right)}{2\,b^4\,d^5\,\ln(F)^4}-\frac{3\,x^4\,\left(b\,\ln(F)-15\,c^2\right)}{b^4\,d^3\,\ln(F)^4}-\frac{12\,c\,x^3\,\left(b\,\ln(F)-5\,c^2\right)}{b^4\,d^4\,\ln(F)^4}+\frac{3\,c\,x\,\left(b^2\,\ln(F)^2-4\,b\,c^2\,\ln(F)+6\,c^4\right)}{b^4\,d^6\,\ln(F)^4}\right)}{x^6+\frac{c^6}{d^6}+\frac{6\,c\,x^5}{d}+\frac{6\,c^5\,x}{d^5}+\frac{15\,c^2\,x^4}{d^2}+\frac{20\,c^3\,x^3}{d^3}+\frac{15\,c^4\,x^2}{d^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^9,x)
```

```
[Out] (F^a*F^(b/(c^2 + d^2*x^2 + 2*c*d*x))*((3*x^6)/(b^4*d*log(F)^4) - (b^3*log(F
)^3 - 6*c^6 + 6*b*c^4*log(F) - 3*b^2*c^2*log(F)^2)/(2*b^4*d^7*log(F)^4) + (
18*c*x^5)/(b^4*d^2*log(F)^4) + (3*x^2*(b^2*log(F)^2 + 30*c^4 - 12*b*c^2*log
(F)))/(2*b^4*d^5*log(F)^4) - (3*x^4*(b*log(F) - 15*c^2))/(b^4*d^3*log(F)^4)
 - (12*c*x^3*(b*log(F) - 5*c^2))/(b^4*d^4*log(F)^4) + (3*c*x*(b^2*log(F)^2
+ 6*c^4 - 4*b*c^2*log(F)))/(b^4*d^6*log(F)^4)))/(x^6 + c^6/d^6 + (6*c*x^5)/
d + (6*c^5*x)/d^5 + (15*c^2*x^4)/d^2 + (20*c^3*x^3)/d^3 + (15*c^4*x^2)/d^4)
```

3.325 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^{11}}\,dx$

Optimal. Leaf size=96

$$-\frac{F^{a+\frac{b}{(c+dx)^2}}\left(24(c+dx)^8-24b(c+dx)^6\log(F)+12b^2(c+dx)^4\log^2(F)-4b^3(c+dx)^2\log^3(F)+b^4\log^4(F)\right)}{2b^5d(c+dx)^8\log^5(F)}$$

```
[Out] -1/2*F^(a+b/(d*x+c)^2)*(24*(d*x+c)^8-24*b*(d*x+c)^6*ln(F)+12*b^2*(d*x+c)^4*
ln(F)^2-4*b^3*(d*x+c)^2*ln(F)^3+b^4*ln(F)^4)/b^5/d/(d*x+c)^8/ln(F)^5
```

Rubi [A]
time = 0.05, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2249}

$$-\frac{F^{a+\frac{b}{(c+dx)^2}}\left(b^4\log^4(F)-4b^3\log^3(F)(c+dx)^2+12b^2\log^2(F)(c+dx)^4-24b\log(F)(c+dx)^6+24(c+dx)^8\right)}{2b^5d\log^5(F)(c+dx)^8}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^11,x]
```

```
[Out] -1/2*(F^(a + b/(c + d*x)^2)*(24*(c + d*x)^8 - 24*b*(c + d*x)^6*Log[F] + 12*
b^2*(c + d*x)^4*Log[F]^2 - 4*b^3*(c + d*x)^2*Log[F]^3 + b^4*Log[F]^4))/(b^5
*d*(c + d*x)^8*Log[F]^5)
```

Rule 2249

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> With[{p = Simplify[(m + 1)/n]}, Simp[(-F^a)*((f/d)^m/(d*n*
((-b)*Log[F])^p))*Simplify[FunctionExpand[Gamma[p, (-b)*(c + d*x)^n*Log[F]]
]], x] /; IGtQ[p, 0]] /; FreeQ[{F, a, b, c, d, e, f, m, n}, x] && EqQ[d*e -
 c*f, 0] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^{11}}\,dx=-\frac{F^a\Gamma\left(5,-\frac{b\log(F)}{(c+dx)^2}\right)}{2b^5d\log^5(F)}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

time = 0.01, size = 31, normalized size = 0.32

$$-\frac{F^a\Gamma\left(5,-\frac{b\log(F)}{(c+dx)^2}\right)}{2b^5d\log^5(F)}$$

Antiderivative was successfully verified.

[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^11,x]

[Out] -1/2*(F^a*Gamma[5, -((b*Log[F])/(c + d*x)^2)])/(b^5*d*Log[F]^5)

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 340 vs. 2(94) = 188.
time = 0.12, size = 341, normalized size = 3.55

method	result
risch	$-\frac{\left(b^4\ln(F)^4+24c^8+48d^3cx^3b^2\ln(F)^2+72\ln(F)^2b^2c^2d^2x^2+48\ln(F)^2b^2c^3dx+12\ln(F)^2b^2c^4-4\ln(F)^3b^3c^2-24\ln(F)bc^6-144\ln(F)\right.}{}$
norman	$\frac{-\frac{12d^9x^{10}e^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{\ln(F)^5b^5}-\frac{c\left(b^4\ln(F)^4-8\ln(F)^3b^3c^2+36\ln(F)^2b^2c^4-96\ln(F)bc^6+120c^8\right)xe^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{b^5\ln(F)^5}-\frac{d\left(b^4\ln(F)^4-24\ln(F)^3\right.}{}}{}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a+b/(d*x+c)^2)/(d*x+c)^11,x,method=_RETURNVERBOSE)

[Out] -1/2*(b^4*ln(F)^4+24*c^8+48*d^3*c*x^3*b^2*ln(F)^2+72*ln(F)^2*b^2*c^2*d^2*x^2+48*ln(F)^2*b^2*c^3*d*x+12*ln(F)^2*b^2*c^4-4*ln(F)^3*b^3*c^2-24*ln(F)*b*c^6-144*ln(F)*b*c*d^5*x^5-360*ln(F)*b*c^2*d^4*x^4-480*ln(F)*b*c^3*d^3*x^3-360*ln(F)*b*c^4*d^2*x^2-144*ln(F)*b*c^5*d*x-8*ln(F)^3*b^3*c*d*x-4*ln(F)^3*b^3*d^2*x^2+12*d^4*x^4*b^2*ln(F)^2+192*c*d^7*x^7+672*c^2*d^6*x^6+1344*c^3*d^5*x^5+1680*c^4*d^4*x^4+1344*c^5*d^3*x^3+672*c^6*d^2*x^2+192*c^7*d*x+24*d^8*x^8-24*ln(F)*b*d^6*x^6)/b^5/ln(F)^5/d/(d*x+c)^8*F^((a*d^2*x^2+2*a*c*d*x+a*c^2+b)/(d*x+c)^2)

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 526 vs. 2(94) = 188.
time = 0.30, size = 526, normalized size = 5.48

$$-\frac{\left(24F^ad^8x^8+192F^acd^7x^7+24F^ac^8-24F^abc^6\log(F)+12F^ab^2c^4\log(F)^2-4F^ab^3c^2\log(F)^3+F^ab^4\log(F)^4+24\left(28F^ac^2d^6-F^abd^6\log(F)\right)x^6+48\left(28F^ac^3d^5-3F^abcd^5\log(F)\right)x^5+12\left(140F^ac^4d^4-30F^abc^2d^4\log(F)+F^ab^2d^4\log(F)^2\right)x^4+48\left(28F^ac^5d^3-10F^abc^3d^3\log(F)+F^ab^2cd^3\log(F)^2\right)x^3+4\left(168F^ac^6d^2-90F^abc^4d^2\log(F)+18F^ab^2c^2d^2\log(F)^2-F^ab^3d^2\log(F)^3\right)x^2+8\left(24F^ac^7d-18F^abc^5d\log(F)+6F^ab^2c^3d\log(F)^2-F^ab^3cd\log(F)^3\right)x\right)F^{\frac{b}{d^2x^2+2cdx+c^2}}}{2\left(b^5d^9x^8\log(F)^5+8b^5cd^8x^7\log(F)^5+28b^5c^2d^7x^6\log(F)^5+56b^5c^3d^6x^5\log(F)^5+70b^5c^4d^5x^4\log(F)^5+56b^5c^5d^4x^3\log(F)^5+28b^5c^6d^3x^2\log(F)^5+8b^5c^7d^2x\log(F)^5+b^5c^8d\log(F)^5\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^11,x, algorithm="maxima")

[Out] -1/2*(24*F^a*d^8*x^8 + 192*F^a*c*d^7*x^7 + 24*F^a*c^8 - 24*F^a*b*c^6*log(F) + 12*F^a*b^2*c^4*log(F)^2 - 4*F^a*b^3*c^2*log(F)^3 + F^a*b^4*log(F)^4 + 24

```
*(28*F^a*c^2*d^6 - F^a*b*d^6*log(F))*x^6 + 48*(28*F^a*c^3*d^5 - 3*F^a*b*c*d
^5*log(F))*x^5 + 12*(140*F^a*c^4*d^4 - 30*F^a*b*c^2*d^4*log(F) + F^a*b^2*d^
4*log(F)^2)*x^4 + 48*(28*F^a*c^5*d^3 - 10*F^a*b*c^3*d^3*log(F) + F^a*b^2*c*
d^3*log(F)^2)*x^3 + 4*(168*F^a*c^6*d^2 - 90*F^a*b*c^4*d^2*log(F) + 18*F^a*b
^2*c^2*d^2*log(F)^2 - F^a*b^3*d^2*log(F)^3)*x^2 + 8*(24*F^a*c^7*d - 18*F^a*
b*c^5*d*log(F) + 6*F^a*b^2*c^3*d*log(F)^2 - F^a*b^3*c*d*log(F)^3)*x)*F^(b/(
d^2*x^2 + 2*c*d*x + c^2))/(b^5*d^9*x^8*log(F)^5 + 8*b^5*c*d^8*x^7*log(F)^5
+ 28*b^5*c^2*d^7*x^6*log(F)^5 + 56*b^5*c^3*d^6*x^5*log(F)^5 + 70*b^5*c^4*d^
5*x^4*log(F)^5 + 56*b^5*c^5*d^4*x^3*log(F)^5 + 28*b^5*c^6*d^3*x^2*log(F)^5
+ 8*b^5*c^7*d^2*x*log(F)^5 + b^5*c^8*d*log(F)^5)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 420 vs. $2(94) = 188$.
time = 0.40, size = 420, normalized size = 4.38

$$-\frac{\left(24\,d^{8}x^{8}+192\,cd^{7}x^{7}+672\,c^{2}d^{6}x^{6}+1344\,c^{3}d^{5}x^{5}+1680\,c^{4}d^{4}x^{4}+1344\,c^{5}d^{3}x^{3}+672\,c^{6}d^{2}x^{2}+192\,c^{7}dx+24\,c^{8}+b^{4}\log\left(F\right)^{4}-4\left(b^{3}d^{2}x^{2}+2\,b^{3}cdx+b^{3}c^{2}\right)\log\left(F\right)^{3}+12\left(b^{2}d^{4}x^{4}+4\,b^{2}cd^{3}x^{3}+6\,b^{2}c^{2}d^{2}x^{2}+4\,b^{2}c^{3}dx+b^{2}c^{4}\right)\log\left(F\right)^{2}-24\left(bd^{6}x^{6}+6\,bcd^{5}x^{5}+15\,bc^{2}d^{4}x^{4}+20\,bc^{3}d^{3}x^{3}+15\,bc^{4}d^{2}x^{2}+6\,bc^{5}dx+bc^{6}\right)\log\left(F\right)\right)F^{\frac{ad^{2}x^{2}+2\,acdx+ac^{2}+b}{d^{2}x^{2}+2\,cdx+c^{2}}}}{2\left(b^{5}d^{9}x^{8}+8\,b^{5}cd^{8}x^{7}+28\,b^{5}c^{2}d^{7}x^{6}+56\,b^{5}c^{3}d^{6}x^{5}+70\,b^{5}c^{4}d^{5}x^{4}+56\,b^{5}c^{5}d^{4}x^{3}+28\,b^{5}c^{6}d^{3}x^{2}+8\,b^{5}c^{7}d^{2}x+b^{5}c^{8}d\right)\log\left(F\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^11,x, algorithm="fricas")
```

```
[Out] -1/2*(24*d^8*x^8 + 192*c*d^7*x^7 + 672*c^2*d^6*x^6 + 1344*c^3*d^5*x^5 + 168
0*c^4*d^4*x^4 + 1344*c^5*d^3*x^3 + 672*c^6*d^2*x^2 + 192*c^7*d*x + 24*c^8 +
 b^4*log(F)^4 - 4*(b^3*d^2*x^2 + 2*b^3*c*d*x + b^3*c^2)*log(F)^3 + 12*(b^2*
d^4*x^4 + 4*b^2*c*d^3*x^3 + 6*b^2*c^2*d^2*x^2 + 4*b^2*c^3*d*x + b^2*c^4)*lo
g(F)^2 - 24*(b*d^6*x^6 + 6*b*c*d^5*x^5 + 15*b*c^2*d^4*x^4 + 20*b*c^3*d^3*x^
3 + 15*b*c^4*d^2*x^2 + 6*b*c^5*d*x + b*c^6)*log(F))*F^((a*d^2*x^2 + 2*a*c*d
*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2))/((b^5*d^9*x^8 + 8*b^5*c*d^8*x^7
+ 28*b^5*c^2*d^7*x^6 + 56*b^5*c^3*d^6*x^5 + 70*b^5*c^4*d^5*x^4 + 56*b^5*c^5
*d^4*x^3 + 28*b^5*c^6*d^3*x^2 + 8*b^5*c^7*d^2*x + b^5*c^8*d)*log(F)^5)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 518 vs. $2(95) = 190$.
time = 0.33, size = 518, normalized size = 5.40

$$\frac{F^{a+\frac{b}{(c+dx)^{2}}}\left(-b^{4}\log\left(F\right)^{4}+4b^{3}c^{2}\log\left(F\right)^{3}+8b^{3}cdx\log\left(F\right)^{3}+4b^{3}d^{2}x^{2}\log\left(F\right)^{3}-12b^{2}c^{4}\log\left(F\right)^{2}-48b^{2}c^{3}dx\log\left(F\right)^{2}-72b^{2}c^{2}d^{2}x^{2}\log\left(F\right)^{2}-48b^{2}cd^{3}x^{3}\log\left(F\right)^{2}-12b^{2}d^{4}x^{4}\log\left(F\right)^{2}+24bc^{6}\log\left(F\right)+144bc^{5}dx\log\left(F\right)+360bc^{4}d^{2}x^{2}\log\left(F\right)+480bc^{3}d^{3}x^{3}\log\left(F\right)+360bc^{2}d^{4}x^{4}\log\left(F\right)+144bcd^{5}x^{5}\log\left(F\right)+24bd^{6}x^{6}\log\left(F\right)-24c^{8}-192c^{7}dx-672c^{6}d^{2}x^{2}-1344c^{5}d^{3}x^{3}-1680c^{4}d^{4}x^{4}-1344c^{3}d^{5}x^{5}-672c^{2}d^{6}x^{6}-192cd^{7}x^{7}-24d^{8}x^{8}\right)}{2b^{5}c^{8}d\log\left(F\right)^{5}+16b^{5}c^{7}d^{2}x\log\left(F\right)^{5}+56b^{5}c^{6}d^{3}x^{2}\log\left(F\right)^{5}+112b^{5}c^{5}d^{4}x^{3}\log\left(F\right)^{5}+140b^{5}c^{4}d^{5}x^{4}\log\left(F\right)^{5}+112b^{5}c^{3}d^{6}x^{5}\log\left(F\right)^{5}+56b^{5}c^{2}d^{7}x^{6}\log\left(F\right)^{5}+16b^{5}cd^{8}x^{7}\log\left(F\right)^{5}+2b^{5}d^{9}x^{8}\log\left(F\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**11,x)
```

```
[Out] F**(a + b/(c + d*x)**2)*(-b**4*log(F)**4 + 4*b**3*c**2*log(F)**3 + 8*b**3*c
*d*x*log(F)**3 + 4*b**3*d**2*x**2*log(F)**3 - 12*b**2*c**4*log(F)**2 - 48*b
**2*c**3*d*x*log(F)**2 - 72*b**2*c**2*d**2*x**2*log(F)**2 - 48*b**2*c*d**3*
x**3*log(F)**2 - 12*b**2*d**4*x**4*log(F)**2 + 24*b*c**6*log(F) + 144*b*c**
5*d*x*log(F) + 360*b*c**4*d**2*x**2*log(F) + 480*b*c**3*d**3*x**3*log(F) +
360*b*c**2*d**4*x**4*log(F) + 144*b*c*d**5*x**5*log(F) + 24*b*d**6*x**6*log
(F) - 24*c**8 - 192*c**7*d*x - 672*c**6*d**2*x**2 - 1344*c**5*d**3*x**3 - 1
```

```
680*c**4*d**4*x**4 - 1344*c**3*d**5*x**5 - 672*c**2*d**6*x**6 - 192*c*d**7*
x**7 - 24*d**8*x**8)/(2*b**5*c**8*d*log(F)**5 + 16*b**5*c**7*d**2*x*log(F)*
*5 + 56*b**5*c**6*d**3*x**2*log(F)**5 + 112*b**5*c**5*d**4*x**3*log(F)**5 +
 140*b**5*c**4*d**5*x**4*log(F)**5 + 112*b**5*c**3*d**6*x**5*log(F)**5 + 56
*b**5*c**2*d**7*x**6*log(F)**5 + 16*b**5*c*d**8*x**7*log(F)**5 + 2*b**5*d**
9*x**8*log(F)**5)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^11,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^11, x)
```

Mupad [B]
time = 4.57, size = 427, normalized size = 4.45

$$-\frac{F^a\,F^{\frac{b}{c^2+2\,c\,d\,x+d^2\,x^2}}\,\left(\frac{b^4\,\ln(F)^4-4\,b^3\,c^2\,\ln(F)^3+12\,b^2\,c^4\,\ln(F)^2-24\,b\,c^6\,\ln(F)+24\,c^8}{2\,b^5\,d^9\,\ln(F)^5}+\frac{12\,x^8}{b^5\,d\,\ln(F)^5}+\frac{96\,c\,x^7}{b^5\,d^2\,\ln(F)^5}-\frac{2\,x^2\,\left(b^3\,\ln(F)^3-18\,b^2\,c^2\,\ln(F)^2+90\,b\,c^4\,\ln(F)-168\,c^6\right)}{b^5\,d^7\,\ln(F)^5}+\frac{6\,x^4\,\left(b^2\,\ln(F)^2-30\,b\,c^2\,\ln(F)+140\,c^4\right)}{b^5\,d^5\,\ln(F)^5}-\frac{12\,x^6\,\left(b\,\ln(F)-28\,c^2\right)}{b^5\,d^3\,\ln(F)^5}+\frac{24\,c\,x^3\,\left(b^2\,\ln(F)^2-10\,b\,c^2\,\ln(F)+28\,c^4\right)}{b^5\,d^6\,\ln(F)^5}-\frac{24\,c\,x^5\,\left(3\,b\,\ln(F)-28\,c^2\right)}{b^5\,d^4\,\ln(F)^5}-\frac{4\,c\,x\,\left(b^3\,\ln(F)^3-6\,b^2\,c^2\,\ln(F)^2+18\,b\,c^4\,\ln(F)-24\,c^6\right)}{b^5\,d^8\,\ln(F)^5}\right)}{x^8+\frac{c^8}{d^8}+\frac{8\,c\,x^7}{d}+\frac{8\,c^7\,x}{d^7}+\frac{28\,c^2\,x^6}{d^2}+\frac{56\,c^3\,x^5}{d^3}+\frac{70\,c^4\,x^4}{d^4}+\frac{56\,c^5\,x^3}{d^5}+\frac{28\,c^6\,x^2}{d^6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^11,x)
```

```
[Out] -(F^a*F^(b/(c^2 + d^2*x^2 + 2*c*d*x))*((b^4*log(F)^4 + 24*c^8 - 24*b*c^6*lo
g(F) + 12*b^2*c^4*log(F)^2 - 4*b^3*c^2*log(F)^3)/(2*b^5*d^9*log(F)^5) + (12
*x^8)/(b^5*d*log(F)^5) + (96*c*x^7)/(b^5*d^2*log(F)^5) - (2*x^2*(b^3*log(F)
^3 - 168*c^6 + 90*b*c^4*log(F) - 18*b^2*c^2*log(F)^2))/(b^5*d^7*log(F)^5) +
 (6*x^4*(b^2*log(F)^2 + 140*c^4 - 30*b*c^2*log(F)))/(b^5*d^5*log(F)^5) - (1
2*x^6*(b*log(F) - 28*c^2))/(b^5*d^3*log(F)^5) + (24*c*x^3*(b^2*log(F)^2 + 2
8*c^4 - 10*b*c^2*log(F)))/(b^5*d^6*log(F)^5) - (24*c*x^5*(3*b*log(F) - 28*c
^2))/(b^5*d^4*log(F)^5) - (4*c*x*(b^3*log(F)^3 - 24*c^6 + 18*b*c^4*log(F) -
 6*b^2*c^2*log(F)^2))/(b^5*d^8*log(F)^5)))/(x^8 + c^8/d^8 + (8*c*x^7)/d + (
8*c^7*x)/d^7 + (28*c^2*x^6)/d^2 + (56*c^3*x^5)/d^3 + (70*c^4*x^4)/d^4 + (56
*c^5*x^3)/d^5 + (28*c^6*x^2)/d^6)
```

3.326 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^{13}}\,dx$

Optimal. Leaf size=113

$$\frac{F^{a+\frac{b}{(c+dx)^2}}\left(120(c+dx)^{10}-120b(c+dx)^8\log(F)+60b^2(c+dx)^6\log^2(F)-20b^3(c+dx)^4\log^3(F)+5b^4(c-\right.}{2b^6d(c+dx)^{10}\log^6(F)}$$

```
[Out] 1/2*F^(a+b/(d*x+c)^2)*(120*(d*x+c)^10-120*b*(d*x+c)^8*ln(F)+60*b^2*(d*x+c)^
6*ln(F)^2-20*b^3*(d*x+c)^4*ln(F)^3+5*b^4*(d*x+c)^2*ln(F)^4-b^5*ln(F)^5)/b^6
/d/(d*x+c)^10/ln(F)^6
```

Rubi [A]
time = 0.06, antiderivative size = 113, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2249}

$$\frac{F^{a+\frac{b}{(c+dx)^2}}\left(-b^5\log^5(F)+5b^4\log^4(F)(c+dx)^2-20b^3\log^3(F)(c+dx)^4+60b^2\log^2(F)(c+dx)^6-120b\log(F)(c+dx)^8+120(c+dx)^{10}\right)}{2b^6d\log^6(F)(c+dx)^{10}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^13,x]
```

```
[Out] (F^(a + b/(c + d*x)^2)*(120*(c + d*x)^10 - 120*b*(c + d*x)^8*Log[F] + 60*b^
2*(c + d*x)^6*Log[F]^2 - 20*b^3*(c + d*x)^4*Log[F]^3 + 5*b^4*(c + d*x)^2*Lo
g[F]^4 - b^5*Log[F]^5))/(2*b^6*d*(c + d*x)^10*Log[F]^6)
```

Rule 2249

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> With[{p = Simplify[(m + 1)/n]}, Simp[(-F^a)*((f/d)^m/(d*n*
((-b)*Log[F])^p))*Simplify[FunctionExpand[Gamma[p, (-b)*(c + d*x)^n*Log[F]]
]], x] /; IGtQ[p, 0]] /; FreeQ[{F, a, b, c, d, e, f, m, n}, x] && EqQ[d*e -
 c*f, 0] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^{13}}\,dx = \frac{F^a\Gamma\left(6,-\frac{b\log(F)}{(c+dx)^2}\right)}{2b^6d\log^6(F)}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

time = 0.01, size = 31, normalized size = 0.27

$$\frac{F^a\Gamma\left(6,-\frac{b\log(F)}{(c+dx)^2}\right)}{2b^6d\log^6(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^13,x]
```

```
[Out] (F^a*Gamma[6, -((b*Log[F])/(c + d*x)^2)])/(2*b^6*d*Log[F]^6)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 501 vs. 2(111) = 222.
time = 0.15, size = 502, normalized size = 4.44

method	result
risch	$-\frac{\left(b^5\ln(F)^5+960\ln(F)bcd^7x^7+3360\ln(F)bc^2d^6x^6+6720\ln(F)bc^3d^5x^5+8400\ln(F)bc^4d^4x^4+80\ln(F)^3b^3cd^3x^3+6720\ln(F)bc^5d^3x\cdots\right.}{\cdots}$
norman	$\frac{\frac{60d^{11}x^{12}e^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{\ln(F)^6b^6}-\frac{\left(b^5\ln(F)^5-5\ln(F)^4b^4c^2+20\ln(F)^3b^3c^4-60\ln(F)^2b^2c^6+120\ln(F)bc^8-120c^{10}\right)c^2e^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{2b^6\ln(F)^6d}-\frac{c\left(b^5\cdots\right.}{\cdots}\cdots}{\cdots}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^2)/(d*x+c)^13,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*(b^5*ln(F)^5+960*ln(F)*b*c*d^7*x^7+3360*ln(F)*b*c^2*d^6*x^6+6720*ln(F)
*b*c^3*d^5*x^5+8400*ln(F)*b*c^4*d^4*x^4+80*ln(F)^3*b^3*c*d^3*x^3+6720*ln(F)
*b*c^5*d^3*x^3+120*ln(F)^3*b^3*c^2*d^2*x^2+3360*ln(F)*b*c^6*d^2*x^2-10*ln(F
)^4*b^4*c*d*x+80*ln(F)^3*b^3*c^3*d*x+960*ln(F)*b*c^7*d*x-120*c^10-1200*c*d^
9*x^9-5400*c^2*d^8*x^8-14400*c^3*d^7*x^7-25200*c^4*d^6*x^6-30240*c^5*d^5*x^
5-25200*c^6*d^4*x^4-14400*c^7*d^3*x^3-5400*c^8*d^2*x^2+120*ln(F)*b*c^8-360*
c*d^5*x^5*ln(F)^2*b^2-900*c^2*d^4*x^4*ln(F)^2*b^2-1200*ln(F)^2*b^2*c^3*d^3*
x^3-900*ln(F)^2*b^2*c^4*d^2*x^2-360*ln(F)^2*b^2*c^5*d*x+120*ln(F)*b*d^8*x^8
+20*ln(F)^3*b^3*d^4*x^4-5*ln(F)^4*b^4*d^2*x^2-60*ln(F)^2*b^2*c^6-120*d^10*x
^10-60*d^6*x^6*ln(F)^2*b^2-1200*c^9*d*x-5*ln(F)^4*b^4*c^2+20*ln(F)^3*b^3*c^
4)/b^6/ln(F)^6/d/(d*x+c)^10*F^((a*d^2*x^2+2*a*c*d*x+a*c^2+b)/(d*x+c)^2)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 740 vs. 2(111) = 222.
time = 0.31, size = 740, normalized size = 6.55

$$\frac{\left(120F^ad^{10}x^{10}+1200F^acd^9x^9+120F^ac^{10}-120F^abc^8\log(F)+60F^ab^2c^6\log(F)^2-20F^ab^3c^4\log(F)^3+5F^ab^4c^2\log(F)^4-F^ab^5\log(F)^5+120\left(45F^ac^2d^8-F^abd^8\log(F)\right)x^8+960\left(15F^ac^3d^7-F^abcd^7\log(F)\right)x^7+60\left(420F^ac^4d^6-56F^abc^2d^6\log(F)+F^ab^2d^6\log(F)^2\right)x^6+120\left(252F^ac^5d^5-56F^abc^3d^5\log(F)+3F^ab^2cd^5\log(F)^2\right)x^5+20\left(1260F^ac^6d^4-420F^abc^4d^4\log(F)+45F^ab^2c^2d^4\log(F)^2-F^ab^3d^4\log(F)^3\right)x^4+80\left(180F^ac^7d^3-84F^abc^5d^3\log(F)+15F^ab^2c^3d^3\log(F)^2-F^ab^3cd^3\log(F)^3\right)x^3+5\left(1080F^ac^8d^2-672F^abc^6d^2\log(F)+180F^ab^2c^4d^2\log(F)^2-24F^ab^3c^2d^2\log(F)^3+F^ab^4d^2\log(F)^4\right)x^2+10\left(120F^ac^9d-96F^abc^7d\log(F)+36F^ab^2c^5d\log(F)^2-8F^ab^3c^3d\log(F)^3+F^ab^4cd\log(F)^4\right)x\right)F^{\frac{b}{d^2x^2+2cdx+c^2}}}{2\left(b^6d^{11}x^{10}\log(F)^6+10b^6cd^{10}x^9\log(F)^6+45b^6c^2d^9x^8\log(F)^6+120b^6c^3d^8x^7\log(F)^6+210b^6c^4d^7x^6\log(F)^6+252b^6c^5d^6x^5\log(F)^6+210b^6c^6d^5x^4\log(F)^6+120b^6c^7d^4x^3\log(F)^6+45b^6c^8d^3x^2\log(F)^6+10b^6c^9d^2x\log(F)^6+b^6c^{10}d\log(F)^6\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^13,x, algorithm="maxima")
```

```
[Out] 1/2*(120*F^a*d^10*x^10 + 1200*F^a*c*d^9*x^9 + 120*F^a*c^10 - 120*F^a*b*c^8*
log(F) + 60*F^a*b^2*c^6*log(F)^2 - 20*F^a*b^3*c^4*log(F)^3 + 5*F^a*b^4*c^2*
log(F)^4 - F^a*b^5*log(F)^5 + 120*(45*F^a*c^2*d^8 - F^a*b*d^8*log(F))*x^8 +
 960*(15*F^a*c^3*d^7 - F^a*b*c*d^7*log(F))*x^7 + 60*(420*F^a*c^4*d^6 - 56*F
^a*b*c^2*d^6*log(F) + F^a*b^2*d^6*log(F)^2)*x^6 + 120*(252*F^a*c^5*d^5 - 56
*F^a*b*c^3*d^5*log(F) + 3*F^a*b^2*c*d^5*log(F)^2)*x^5 + 20*(1260*F^a*c^6*d^
4 - 420*F^a*b*c^4*d^4*log(F) + 45*F^a*b^2*c^2*d^4*log(F)^2 - F^a*b^3*d^4*lo
g(F)^3)*x^4 + 80*(180*F^a*c^7*d^3 - 84*F^a*b*c^5*d^3*log(F) + 15*F^a*b^2*c^
3*d^3*log(F)^2 - F^a*b^3*c*d^3*log(F)^3)*x^3 + 5*(1080*F^a*c^8*d^2 - 672*F^
a*b*c^6*d^2*log(F) + 180*F^a*b^2*c^4*d^2*log(F)^2 - 24*F^a*b^3*c^2*d^2*log(
F)^3 + F^a*b^4*d^2*log(F)^4)*x^2 + 10*(120*F^a*c^9*d - 96*F^a*b*c^7*d*log(F
) + 36*F^a*b^2*c^5*d*log(F)^2 - 8*F^a*b^3*c^3*d*log(F)^3 + F^a*b^4*c*d*log(
F)^4)*x)*F^(b/(d^2*x^2 + 2*c*d*x + c^2))/(b^6*d^11*x^10*log(F)^6 + 10*b^6*c
*d^10*x^9*log(F)^6 + 45*b^6*c^2*d^9*x^8*log(F)^6 + 120*b^6*c^3*d^8*x^7*log(
F)^6 + 210*b^6*c^4*d^7*x^6*log(F)^6 + 252*b^6*c^5*d^6*x^5*log(F)^6 + 210*b^
6*c^6*d^5*x^4*log(F)^6 + 120*b^6*c^7*d^4*x^3*log(F)^6 + 45*b^6*c^8*d^3*x^2*
log(F)^6 + 10*b^6*c^9*d^2*x*log(F)^6 + b^6*c^10*d*log(F)^6)
```

Fricas [**B**] Leaf count of result is larger than twice the leaf count of optimal. 583 vs. $2(111) = 222$.

time = 0.38, size = 583, normalized size = 5.16

$$\frac{\left(120\,d^{10}x^{10}+1200\,cd^{9}x^{9}+5400\,c^{2}d^{8}x^{8}+14400\,c^{3}d^{7}x^{7}+25200\,c^{4}d^{6}x^{6}+30240\,c^{5}d^{5}x^{5}+25200\,c^{6}d^{4}x^{4}+14400\,c^{7}d^{3}x^{3}+5400\,c^{8}d^{2}x^{2}+1200\,c^{9}dx+120\,c^{10}-b^{5}\log\left(F\right)^{5}+5\left(b^{4}d^{2}x^{2}+2\,b^{4}cdx+b^{4}c^{2}\right)\log\left(F\right)^{4}-20\left(b^{3}d^{4}x^{4}+4\,b^{3}cd^{3}x^{3}+6\,b^{3}c^{2}d^{2}x^{2}+4\,b^{3}c^{3}dx+b^{3}c^{4}\right)\log\left(F\right)^{3}+60\left(b^{2}d^{6}x^{6}+6\,b^{2}cd^{5}x^{5}+15\,b^{2}c^{2}d^{4}x^{4}+20\,b^{2}c^{3}d^{3}x^{3}+15\,b^{2}c^{4}d^{2}x^{2}+6\,b^{2}c^{5}dx+b^{2}c^{6}\right)\log\left(F\right)^{2}-120\left(bd^{8}x^{8}+8\,bcd^{7}x^{7}+28\,bc^{2}d^{6}x^{6}+56\,bc^{3}d^{5}x^{5}+70\,bc^{4}d^{4}x^{4}+56\,bc^{5}d^{3}x^{3}+28\,bc^{6}d^{2}x^{2}+8\,bc^{7}dx+bc^{8}\right)\log\left(F\right)\right)F^{\frac{ad^{2}x^{2}+2\,acdx+ac^{2}+b}{d^{2}x^{2}+2\,cdx+c^{2}}}}{2\left(b^{6}d^{11}x^{10}+10\,b^{6}cd^{10}x^{9}+45\,b^{6}c^{2}d^{9}x^{8}+120\,b^{6}c^{3}d^{8}x^{7}+210\,b^{6}c^{4}d^{7}x^{6}+252\,b^{6}c^{5}d^{6}x^{5}+210\,b^{6}c^{6}d^{5}x^{4}+120\,b^{6}c^{7}d^{4}x^{3}+45\,b^{6}c^{8}d^{3}x^{2}+10\,b^{6}c^{9}d^{2}x+b^{6}c^{10}d\right)\log\left(F\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^13,x, algorithm="fricas")
```

```
[Out] 1/2*(120*d^10*x^10 + 1200*c*d^9*x^9 + 5400*c^2*d^8*x^8 + 14400*c^3*d^7*x^7
+ 25200*c^4*d^6*x^6 + 30240*c^5*d^5*x^5 + 25200*c^6*d^4*x^4 + 14400*c^7*d^3
*x^3 + 5400*c^8*d^2*x^2 + 1200*c^9*d*x + 120*c^10 - b^5*log(F)^5 + 5*(b^4*d
^2*x^2 + 2*b^4*c*d*x + b^4*c^2)*log(F)^4 - 20*(b^3*d^4*x^4 + 4*b^3*c*d^3*x^
3 + 6*b^3*c^2*d^2*x^2 + 4*b^3*c^3*d*x + b^3*c^4)*log(F)^3 + 60*(b^2*d^6*x^6
 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + 20*b^2*c^3*d^3*x^3 + 15*b^2*c^4*d
^2*x^2 + 6*b^2*c^5*d*x + b^2*c^6)*log(F)^2 - 120*(b*d^8*x^8 + 8*b*c*d^7*x^7
 + 28*b*c^2*d^6*x^6 + 56*b*c^3*d^5*x^5 + 70*b*c^4*d^4*x^4 + 56*b*c^5*d^3*x^
3 + 28*b*c^6*d^2*x^2 + 8*b*c^7*d*x + b*c^8)*log(F))*F^((a*d^2*x^2 + 2*a*c*d
*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2))/((b^6*d^11*x^10 + 10*b^6*c*d^10*
x^9 + 45*b^6*c^2*d^9*x^8 + 120*b^6*c^3*d^8*x^7 + 210*b^6*c^4*d^7*x^6 + 252*
b^6*c^5*d^6*x^5 + 210*b^6*c^6*d^5*x^4 + 120*b^6*c^7*d^4*x^3 + 45*b^6*c^8*d^
3*x^2 + 10*b^6*c^9*d^2*x + b^6*c^10*d)*log(F)^6)
```

Sympy [**B**] Leaf count of result is larger than twice the leaf count of optimal. 745 vs. $2(110) = 220$.

time = 1.51, size = 745, normalized size = 6.59

$$\frac{F^{a+\frac{b}{(c+dx)^{2}}}\left(-b^{5}\log\left(F\right)^{5}+5b^{4}c^{2}\log\left(F\right)^{4}+10b^{4}cdx\log\left(F\right)^{4}+5b^{4}d^{2}x^{2}\log\left(F\right)^{4}-20b^{3}c^{4}\log\left(F\right)^{3}-80b^{3}c^{3}dx\log\left(F\right)^{3}-120b^{3}c^{2}d^{2}x^{2}\log\left(F\right)^{3}-80b^{3}cd^{3}x^{3}\log\left(F\right)^{3}-20b^{3}d^{4}x^{4}\log\left(F\right)^{3}+60b^{2}c^{6}\log\left(F\right)^{2}+360b^{2}c^{5}dx\log\left(F\right)^{2}+900b^{2}c^{4}d^{2}x^{2}\log\left(F\right)^{2}+1200b^{2}c^{3}d^{3}x^{3}\log\left(F\right)^{2}+900b^{2}c^{2}d^{4}x^{4}\log\left(F\right)^{2}+360b^{2}cd^{5}x^{5}\log\left(F\right)^{2}+60b^{2}d^{6}x^{6}\log\left(F\right)^{2}-120bc^{8}\log\left(F\right)-960bc^{7}dx\log\left(F\right)-3360bc^{6}d^{2}x^{2}\log\left(F\right)-6720bc^{5}d^{3}x^{3}\log\left(F\right)-8400bc^{4}d^{4}x^{4}\log\left(F\right)-6720bc^{3}d^{5}x^{5}\log\left(F\right)-3360bc^{2}d^{6}x^{6}\log\left(F\right)-960bcd^{7}x^{7}\log\left(F\right)-120bd^{8}x^{8}\log\left(F\right)+120c^{10}+1200c^{9}dx+5400c^{8}d^{2}x^{2}+14400c^{7}d^{3}x^{3}+25200c^{6}d^{4}x^{4}+30240c^{5}d^{5}x^{5}+25200c^{4}d^{6}x^{6}+14400c^{3}d^{7}x^{7}+5400c^{2}d^{8}x^{8}+1200cd^{9}x^{9}+120d^{10}x^{10}\right)}{2b^{6}c^{10}d\log\left(F\right)^{6}+20b^{6}c^{9}d^{2}x\log\left(F\right)^{6}+90b^{6}c^{8}d^{3}x^{2}\log\left(F\right)^{6}+240b^{6}c^{7}d^{4}x^{3}\log\left(F\right)^{6}+420b^{6}c^{6}d^{5}x^{4}\log\left(F\right)^{6}+504b^{6}c^{5}d^{6}x^{5}\log\left(F\right)^{6}+420b^{6}c^{4}d^{7}x^{6}\log\left(F\right)^{6}+240b^{6}c^{3}d^{8}x^{7}\log\left(F\right)^{6}+90b^{6}c^{2}d^{9}x^{8}\log\left(F\right)^{6}+20b^{6}cd^{10}x^{9}\log\left(F\right)^{6}+2b^{6}d^{11}x^{10}\log\left(F\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**13,x)
```

```
[Out] F**(a + b/(c + d*x)**2)*(-b**5*log(F)**5 + 5*b**4*c**2*log(F)**4 + 10*b**4*
c*d*x*log(F)**4 + 5*b**4*d**2*x**2*log(F)**4 - 20*b**3*c**4*log(F)**3 - 80*
b**3*c**3*d*x*log(F)**3 - 120*b**3*c**2*d**2*x**2*log(F)**3 - 80*b**3*c*d**
3*x**3*log(F)**3 - 20*b**3*d**4*x**4*log(F)**3 + 60*b**2*c**6*log(F)**2 + 3
60*b**2*c**5*d*x*log(F)**2 + 900*b**2*c**4*d**2*x**2*log(F)**2 + 1200*b**2*
c**3*d**3*x**3*log(F)**2 + 900*b**2*c**2*d**4*x**4*log(F)**2 + 360*b**2*c*d
**5*x**5*log(F)**2 + 60*b**2*d**6*x**6*log(F)**2 - 120*b*c**8*log(F) - 960*
b*c**7*d*x*log(F) - 3360*b*c**6*d**2*x**2*log(F) - 6720*b*c**5*d**3*x**3*lo
g(F) - 8400*b*c**4*d**4*x**4*log(F) - 6720*b*c**3*d**5*x**5*log(F) - 3360*b
*c**2*d**6*x**6*log(F) - 960*b*c*d**7*x**7*log(F) - 120*b*d**8*x**8*log(F)
+ 120*c**10 + 1200*c**9*d*x + 5400*c**8*d**2*x**2 + 14400*c**7*d**3*x**3 +
25200*c**6*d**4*x**4 + 30240*c**5*d**5*x**5 + 25200*c**4*d**6*x**6 + 14400*
c**3*d**7*x**7 + 5400*c**2*d**8*x**8 + 1200*c*d**9*x**9 + 120*d**10*x**10)/
(2*b**6*c**10*d*log(F)**6 + 20*b**6*c**9*d**2*x*log(F)**6 + 90*b**6*c**8*d*
*3*x**2*log(F)**6 + 240*b**6*c**7*d**4*x**3*log(F)**6 + 420*b**6*c**6*d**5*
x**4*log(F)**6 + 504*b**6*c**5*d**6*x**5*log(F)**6 + 420*b**6*c**4*d**7*x**
6*log(F)**6 + 240*b**6*c**3*d**8*x**7*log(F)**6 + 90*b**6*c**2*d**9*x**8*lo
g(F)**6 + 20*b**6*c*d**10*x**9*log(F)**6 + 2*b**6*d**11*x**10*log(F)**6)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^13,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^13, x)
```

Mupad [B]
time = 4.99, size = 583, normalized size = 5.16

$$\frac{F^a\,F^{\frac{b}{c^2+2\,c\,d\,x+d^2\,x^2}}\,\left(\frac{60\,x^{10}}{b^6\,d\,\ln(F)^6}-\frac{b^5\,\ln(F)^5-5\,b^4\,c^2\,\ln(F)^4+20\,b^3\,c^4\,\ln(F)^3-60\,b^2\,c^6\,\ln(F)^2+120\,b\,c^8\,\ln(F)-120\,c^{10}}{2\,b^6\,d^{11}\,\ln(F)^6}+\frac{600\,c\,x^9}{b^6\,d^2\,\ln(F)^6}+\frac{5\,x^2\,\left(b^4\,\ln(F)^4-24\,b^3\,c^2\,\ln(F)^3+180\,b^2\,c^4\,\ln(F)^2-672\,b\,c^6\,\ln(F)+1080\,c^8\right)}{2\,b^6\,d^9\,\ln(F)^6}-\frac{10\,x^4\,\left(b^3\,\ln(F)^3-45\,b^2\,c^2\,\ln(F)^2+420\,b\,c^4\,\ln(F)-1260\,c^6\right)}{b^6\,d^7\,\ln(F)^6}+\frac{30\,x^6\,\left(b^2\,\ln(F)^2-56\,b\,c^2\,\ln(F)+420\,c^4\right)}{b^6\,d^5\,\ln(F)^6}-\frac{60\,x^8\,\left(b\,\ln(F)-45\,c^2\right)}{b^6\,d^3\,\ln(F)^6}-\frac{40\,c\,x^3\,\left(b^3\,\ln(F)^3-15\,b^2\,c^2\,\ln(F)^2+84\,b\,c^4\,\ln(F)-180\,c^6\right)}{b^6\,d^8\,\ln(F)^6}+\frac{60\,c\,x^5\,\left(3\,b^2\,\ln(F)^2-56\,b\,c^2\,\ln(F)+252\,c^4\right)}{b^6\,d^6\,\ln(F)^6}-\frac{480\,c\,x^7\,\left(b\,\ln(F)-15\,c^2\right)}{b^6\,d^4\,\ln(F)^6}+\frac{5\,c\,x\,\left(b^4\,\ln(F)^4-8\,b^3\,c^2\,\ln(F)^3+36\,b^2\,c^4\,\ln(F)^2-96\,b\,c^6\,\ln(F)+120\,c^8\right)}{b^6\,d^{10}\,\ln(F)^6}\right)}{x^{10}+\frac{c^{10}}{d^{10}}+\frac{10\,c\,x^9}{d}+\frac{10\,c^9\,x}{d^9}+\frac{45\,c^2\,x^8}{d^2}+\frac{120\,c^3\,x^7}{d^3}+\frac{210\,c^4\,x^6}{d^4}+\frac{252\,c^5\,x^5}{d^5}+\frac{210\,c^6\,x^4}{d^6}+\frac{120\,c^7\,x^3}{d^7}+\frac{45\,c^8\,x^2}{d^8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^13,x)
```

```
[Out] (F^a*F^(b/(c^2 + d^2*x^2 + 2*c*d*x))*((60*x^10)/(b^6*d*log(F)^6) - (b^5*log
(F)^5 - 120*c^10 + 120*b*c^8*log(F) - 60*b^2*c^6*log(F)^2 + 20*b^3*c^4*log(
F)^3 - 5*b^4*c^2*log(F)^4)/(2*b^6*d^11*log(F)^6) + (600*c*x^9)/(b^6*d^2*log
(F)^6) + (5*x^2*(b^4*log(F)^4 + 1080*c^8 - 672*b*c^6*log(F) + 180*b^2*c^4*l
og(F)^2 - 24*b^3*c^2*log(F)^3))/(2*b^6*d^9*log(F)^6) - (10*x^4*(b^3*log(F)^
```

```
3 - 1260*c^6 + 420*b*c^4*log(F) - 45*b^2*c^2*log(F)^2))/(b^6*d^7*log(F)^6)
+ (30*x^6*(b^2*log(F)^2 + 420*c^4 - 56*b*c^2*log(F)))/(b^6*d^5*log(F)^6) -
(60*x^8*(b*log(F) - 45*c^2))/(b^6*d^3*log(F)^6) - (40*c*x^3*(b^3*log(F)^3 -
 180*c^6 + 84*b*c^4*log(F) - 15*b^2*c^2*log(F)^2))/(b^6*d^8*log(F)^6) + (60
*c*x^5*(3*b^2*log(F)^2 + 252*c^4 - 56*b*c^2*log(F)))/(b^6*d^6*log(F)^6) - (
480*c*x^7*(b*log(F) - 15*c^2))/(b^6*d^4*log(F)^6) + (5*c*x*(b^4*log(F)^4 +
120*c^8 - 96*b*c^6*log(F) + 36*b^2*c^4*log(F)^2 - 8*b^3*c^2*log(F)^3))/(b^6
*d^10*log(F)^6)))/(x^10 + c^10/d^10 + (10*c*x^9)/d + (10*c^9*x)/d^9 + (45*c
^2*x^8)/d^2 + (120*c^3*x^7)/d^3 + (210*c^4*x^6)/d^4 + (252*c^5*x^5)/d^5 + (
210*c^6*x^4)/d^6 + (120*c^7*x^3)/d^7 + (45*c^8*x^2)/d^8)
```

3.327 $\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^{10}\,dx$

Optimal. Leaf size=49

$$\frac{F^a(c+dx)^{11}\Gamma\left(-\frac{11}{2},-\frac{b\log(F)}{(c+dx)^2}\right)\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{11/2}}{2d}$$

```
[Out] 1/2*F^a*(d*x+c)^11*(64/10395*Pi^(1/2)*erfc((-b*ln(F)/(d*x+c)^2)^(1/2))-64/1
0395/(-b*ln(F)/(d*x+c)^2)^(1/2)*exp(b*ln(F)/(d*x+c)^2)+32/10395/(-b*ln(F)/(
d*x+c)^2)^(3/2)*exp(b*ln(F)/(d*x+c)^2)-16/3465/(-b*ln(F)/(d*x+c)^2)^(5/2)*e
xp(b*ln(F)/(d*x+c)^2)+8/693/(-b*ln(F)/(d*x+c)^2)^(7/2)*exp(b*ln(F)/(d*x+c)^
2)-4/99/(-b*ln(F)/(d*x+c)^2)^(9/2)*exp(b*ln(F)/(d*x+c)^2)+2/11/(-b*ln(F)/(d
*x+c)^2)^(11/2)*exp(b*ln(F)/(d*x+c)^2))*(-b*ln(F)/(d*x+c)^2)^(11/2)/d
```

Rubi [A]
time = 0.03, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$\frac{F^a(c+dx)^{11}\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{11/2}\text{Gamma}\left(-\frac{11}{2},-\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)*(c + d*x)^10,x]
```

```
[Out] (F^a*(c + d*x)^11*Gamma[-11/2, -((b*Log[F])/(c + d*x)^2)]*(-((b*Log[F])/(c
+ d*x)^2))^(11/2))/(2*d)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^{10}\,dx=\frac{F^a(c+dx)^{11}\Gamma\left(-\frac{11}{2},-\frac{b\log(F)}{(c+dx)^2}\right)\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{11/2}}{2d}$$

Mathematica [A]
time = 0.02, size = 49, normalized size = 1.00

$$\frac{F^a(c+dx)^{11}\Gamma\left(-\frac{11}{2},-\frac{b\log(F)}{(c+dx)^2}\right)\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{11/2}}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)*(c + d*x)^10,x]
```

```
[Out] (F^a*(c + d*x)^11*Gamma[-11/2, -((b*Log[F])/(c + d*x)^2)]*(-((b*Log[F])/(c
+ d*x)^2))^(11/2))/(2*d)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 1172 vs. $2(218) = 436$.
time = 0.13, size = 1173, normalized size = 23.94

method	result	size
risch	Expression too large to display	1173

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^2)*(d*x+c)^10,x,method=_RETURNVERBOSE)
```

```
[Out] 4/99*F^a*d^5*b^2*ln(F)^2*F^(b/(d*x+c)^2)*c*x^6+4/33*F^a*d^4*b^2*ln(F)^2*F^(
b/(d*x+c)^2)*c^2*x^5+20/99*F^a*d^3*b^2*ln(F)^2*F^(b/(d*x+c)^2)*c^3*x^4+20/9
9*F^a*d^2*b^2*ln(F)^2*F^(b/(d*x+c)^2)*c^4*x^3+4/33*F^a*d*b^2*ln(F)^2*F^(b/(
d*x+c)^2)*c^5*x^2+8/693*F^a*d^3*b^3*ln(F)^3*F^(b/(d*x+c)^2)*c*x^4+16/693*F^
a*d^2*b^3*ln(F)^3*F^(b/(d*x+c)^2)*c^2*x^3+16/693*F^a*d*b^3*ln(F)^3*F^(b/(d*
x+c)^2)*c^3*x^2+16/3465*F^a*d*b^4*ln(F)^4*F^(b/(d*x+c)^2)*c*x^2+2/11*F^a*d^
7*b*ln(F)*F^(b/(d*x+c)^2)*c*x^8+8/11*F^a*d^6*b*ln(F)*F^(b/(d*x+c)^2)*c^2*x^
7+56/33*F^a*d^5*b*ln(F)*F^(b/(d*x+c)^2)*c^3*x^6+28/11*F^a*d^4*b*ln(F)*F^(b/
(d*x+c)^2)*c^4*x^5+28/11*F^a*d^3*b*ln(F)*F^(b/(d*x+c)^2)*c^5*x^4+56/33*F^a*
d^2*b*ln(F)*F^(b/(d*x+c)^2)*c^6*x^3+8/11*F^a*d*b*ln(F)*F^(b/(d*x+c)^2)*c^7*
x^2-32/10395*F^a/d*b^6*ln(F)^6*Pi^(1/2)/(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1/
2)/(d*x+c))+2/99*F^a/d*b*ln(F)*F^(b/(d*x+c)^2)*c^9+2/99*F^a*d^8*b*ln(F)*F^(
b/(d*x+c)^2)*x^9+4/693*F^a*d^6*b^2*ln(F)^2*F^(b/(d*x+c)^2)*x^7+8/3465*F^a*d
^4*b^3*ln(F)^3*F^(b/(d*x+c)^2)*x^5+16/10395*F^a*d^2*b^4*ln(F)^4*F^(b/(d*x+c
)^2)*x^3+4/99*F^a*b^2*ln(F)^2*F^(b/(d*x+c)^2)*c^6*x+8/693*F^a*b^3*ln(F)^3*F
^(b/(d*x+c)^2)*c^4*x+16/3465*F^a*b^4*ln(F)^4*F^(b/(d*x+c)^2)*c^2*x+2/11*F^a
*b*ln(F)*F^(b/(d*x+c)^2)*c^8*x+4/693*F^a/d*b^2*ln(F)^2*F^(b/(d*x+c)^2)*c^7+
8/3465*F^a/d*b^3*ln(F)^3*F^(b/(d*x+c)^2)*c^5+16/10395*F^a/d*b^4*ln(F)^4*F^(
b/(d*x+c)^2)*c^3+32/10395*F^a/d*b^5*ln(F)^5*F^(b/(d*x+c)^2)*c+1/11*F^a*d^10
*F^(b/(d*x+c)^2)*x^11+1/11*F^a/d*F^(b/(d*x+c)^2)*c^11+F^a*F^(b/(d*x+c)^2)*c
^10*x+32/10395*F^a*b^5*ln(F)^5*F^(b/(d*x+c)^2)*x+15*F^a*d^7*F^(b/(d*x+c)^2)
*c^3*x^8+30*F^a*d^6*F^(b/(d*x+c)^2)*c^4*x^7+42*F^a*d^5*F^(b/(d*x+c)^2)*c^5*
```

```
x^6+42*F^a*d^4*F^(b/(d*x+c)^2)*c^6*x^5+30*F^a*d^3*F^(b/(d*x+c)^2)*c^7*x^4+1
5*F^a*d^2*F^(b/(d*x+c)^2)*c^8*x^3+5*F^a*d*F^(b/(d*x+c)^2)*c^9*x^2+F^a*d^9*F
^(b/(d*x+c)^2)*c*x^10+5*F^a*d^8*F^(b/(d*x+c)^2)*c^2*x^9
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^10,x, algorithm="maxima")
```

```
[Out] 1/10395*(945*F^a*d^10*x^11 + 10395*F^a*c*d^9*x^10 + 105*(495*F^a*c^2*d^8 +
2*F^a*b*d^8*log(F))*x^9 + 945*(165*F^a*c^3*d^7 + 2*F^a*b*c*d^7*log(F))*x^8
+ 30*(10395*F^a*c^4*d^6 + 252*F^a*b*c^2*d^6*log(F) + 2*F^a*b^2*d^6*log(F)^2
)*x^7 + 210*(2079*F^a*c^5*d^5 + 84*F^a*b*c^3*d^5*log(F) + 2*F^a*b^2*c*d^5*l
og(F)^2)*x^6 + 6*(72765*F^a*c^6*d^4 + 4410*F^a*b*c^4*d^4*log(F) + 210*F^a*b
^2*c^2*d^4*log(F)^2 + 4*F^a*b^3*d^4*log(F)^3)*x^5 + 30*(10395*F^a*c^7*d^3 +
 882*F^a*b*c^5*d^3*log(F) + 70*F^a*b^2*c^3*d^3*log(F)^2 + 4*F^a*b^3*c*d^3*l
og(F)^3)*x^4 + (155925*F^a*c^8*d^2 + 17640*F^a*b*c^6*d^2*log(F) + 2100*F^a*
b^2*c^4*d^2*log(F)^2 + 240*F^a*b^3*c^2*d^2*log(F)^3 + 16*F^a*b^4*d^2*log(F)
^4)*x^3 + 3*(17325*F^a*c^9*d + 2520*F^a*b*c^7*d*log(F) + 420*F^a*b^2*c^5*d*
log(F)^2 + 80*F^a*b^3*c^3*d*log(F)^3 + 16*F^a*b^4*c*d*log(F)^4)*x^2 + (1039
5*F^a*c^10 + 1890*F^a*b*c^8*log(F) + 420*F^a*b^2*c^6*log(F)^2 + 120*F^a*b^3
*c^4*log(F)^3 + 48*F^a*b^4*c^2*log(F)^4 + 32*F^a*b^5*log(F)^5)*x)*F^(b/(d^2
*x^2 + 2*c*d*x + c^2)) + integrate(2/10395*(32*F^a*b^6*d*x*log(F)^6 - 945*F
^a*b*c^11*log(F) - 210*F^a*b^2*c^9*log(F)^2 - 60*F^a*b^3*c^7*log(F)^3 - 24*
F^a*b^4*c^5*log(F)^4 - 16*F^a*b^5*c^3*log(F)^5)*F^(b/(d^2*x^2 + 2*c*d*x + c
^2))/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3), x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 561 vs. 2(212) = 424.
time = 0.38, size = 561, normalized size = 11.45

$$\frac{32\sqrt{\pi}F^ab^5d\sqrt{-\frac{b\log(F)}{d^2}}\operatorname{erf}\left(\frac{d\sqrt{-\frac{b\log(F)}{d^2}}}{dx+c}\right)\log(F)^5+\left(945d^{11}x^{11}+10395cd^{10}x^{10}+51975c^2d^9x^9+155925c^3d^8x^8+311850c^4d^7x^7+436590c^5d^6x^6+436590c^6d^5x^5+311850c^7d^4x^4+155925c^8d^3x^3+51975c^9d^2x^2+10395c^{10}dx+945c^{11}+32(b^5dx+b^5c)\log(F)^5+16(b^4d^3x^3+3b^4cd^2x^2+3b^4c^2dx+b^4c^3)\log(F)^4+24(b^3d^5x^5+5b^3cd^4x^4+10b^3c^2d^3x^3+10b^3c^3d^2x^2+5b^3c^4dx+b^3c^5)\log(F)^3+60(b^2d^7x^7+7b^2cd^6x^6+21b^2c^2d^5x^5+35b^2c^3d^4x^4+35b^2c^4d^3x^3+21b^2c^5d^2x^2+7b^2c^6dx+b^2c^7)\log(F)^2+210(bd^9x^9+9bcd^8x^8+36bc^2d^7x^7+84bc^3d^6x^6+126bc^4d^5x^5+126bc^5d^4x^4+84bc^6d^3x^3+36bc^7d^2x^2+9bc^8dx+bc^9)\log(F)\right)F^{\frac{ad^2x^2+2acdx+ac^2+b}{d^2x^2+2cdx+c^2}}}{10395d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^10,x, algorithm="fricas")
```

```
[Out] 1/10395*(32*sqrt(pi)*F^a*b^5*d*sqrt(-b*log(F)/d^2)*erf(d*sqrt(-b*log(F)/d^2
)/(d*x + c))*log(F)^5 + (945*d^11*x^11 + 10395*c*d^10*x^10 + 51975*c^2*d^9*
x^9 + 155925*c^3*d^8*x^8 + 311850*c^4*d^7*x^7 + 436590*c^5*d^6*x^6 + 436590
*c^6*d^5*x^5 + 311850*c^7*d^4*x^4 + 155925*c^8*d^3*x^3 + 51975*c^9*d^2*x^2
+ 10395*c^10*d*x + 945*c^11 + 32*(b^5*d*x + b^5*c)*log(F)^5 + 16*(b^4*d^3*x
^3 + 3*b^4*c*d^2*x^2 + 3*b^4*c^2*d*x + b^4*c^3)*log(F)^4 + 24*(b^3*d^5*x^5
+ 5*b^3*c*d^4*x^4 + 10*b^3*c^2*d^3*x^3 + 10*b^3*c^3*d^2*x^2 + 5*b^3*c^4*d*x
```

```
 + b^3*c^5)*log(F)^3 + 60*(b^2*d^7*x^7 + 7*b^2*c*d^6*x^6 + 21*b^2*c^2*d^5*x
^5 + 35*b^2*c^3*d^4*x^4 + 35*b^2*c^4*d^3*x^3 + 21*b^2*c^5*d^2*x^2 + 7*b^2*c
^6*d*x + b^2*c^7)*log(F)^2 + 210*(b*d^9*x^9 + 9*b*c*d^8*x^8 + 36*b*c^2*d^7*
x^7 + 84*b*c^3*d^6*x^6 + 126*b*c^4*d^5*x^5 + 126*b*c^5*d^4*x^4 + 84*b*c^6*d
^3*x^3 + 36*b*c^7*d^2*x^2 + 9*b*c^8*d*x + b*c^9)*log(F))*F^((a*d^2*x^2 + 2*
a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2)))/d
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(c+dx)^2}}\left(c+dx\right)^{10}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)*(d*x+c)**10,x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**2)*(c + d*x)**10, x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^10,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^10*F^(a + b/(d*x + c)^2), x)
```

Mupad [**B**]
time = 4.35, size = 265, normalized size = 5.41

$$\frac{F^a\,F^{\frac{b}{(c+d\,x)^2}}\,{(c+d\,x)}^{11}}{11\,d}-\frac{32\,F^a\,\sqrt{\pi}\,{(c+d\,x)}^{11}\,{\left(-\frac{b\,\ln(F)}{(c+d\,x)^2}\right)}^{11/2}}{10395\,d}+\frac{4\,F^a\,F^{\frac{b}{(c+d\,x)^2}}\,b^2\ln\left(F\right)^2{(c+d\,x)}^7}{693\,d}+\frac{8\,F^a\,F^{\frac{b}{(c+d\,x)^2}}\,b^3\ln\left(F\right)^3{(c+d\,x)}^5}{3465\,d}+\frac{16\,F^a\,F^{\frac{b}{(c+d\,x)^2}}\,b^4\ln\left(F\right)^4{(c+d\,x)}^3}{10395\,d}+\frac{2\,F^a\,F^{\frac{b}{(c+d\,x)^2}}\,b\,\ln\left(F\right)\,{(c+d\,x)}^9}{99\,d}+\frac{32\,F^a\,F^{\frac{b}{(c+d\,x)^2}}\,b^5\ln\left(F\right)^5\left(c+d\,x\right)}{10395\,d}+\frac{32\,F^a\,\sqrt{\pi}\,\mathrm{erfc}\left(\sqrt{-\frac{b\,\ln\left(F\right)}{{(c+d\,x)}^2}}\right)\,{(c+d\,x)}^{11}\,{\left(-\frac{b\,\ln(F)}{(c+d\,x)^2}\right)}^{11/2}}{10395\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)*(c + d*x)^10,x)
```

```
[Out] (F^a*F^(b/(c + d*x)^2)*(c + d*x)^11)/(11*d) - (32*F^a*pi^(1/2)*(c + d*x)^11
*(-(b*log(F))/(c + d*x)^2)^(11/2))/(10395*d) + (4*F^a*F^(b/(c + d*x)^2)*b^2
*log(F)^2*(c + d*x)^7)/(693*d) + (8*F^a*F^(b/(c + d*x)^2)*b^3*log(F)^3*(c +
 d*x)^5)/(3465*d) + (16*F^a*F^(b/(c + d*x)^2)*b^4*log(F)^4*(c + d*x)^3)/(10
395*d) + (2*F^a*F^(b/(c + d*x)^2)*b*log(F)*(c + d*x)^9)/(99*d) + (32*F^a*F^
(b/(c + d*x)^2)*b^5*log(F)^5*(c + d*x))/(10395*d) + (32*F^a*pi^(1/2)*erfc((
-(b*log(F))/(c + d*x)^2)^(1/2))*(c + d*x)^11*(-(b*log(F))/(c + d*x)^2)^(11/
2))/(10395*d)
```

3.328 $\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^8\,dx$

Optimal. Leaf size=49

$$\frac{F^a(c+dx)^9\Gamma\left(-\frac{9}{2},-\frac{b\log(F)}{(c+dx)^2}\right)\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{9/2}}{2d}$$

```
[Out] 1/2*F^a*(d*x+c)^9*(-32/945*Pi^(1/2)*erfc((-b*ln(F)/(d*x+c)^2)^(1/2))+32/945
/(-b*ln(F)/(d*x+c)^2)^(1/2)*exp(b*ln(F)/(d*x+c)^2)-16/945/(-b*ln(F)/(d*x+c)
^2)^(3/2)*exp(b*ln(F)/(d*x+c)^2)+8/315/(-b*ln(F)/(d*x+c)^2)^(5/2)*exp(b*ln(
F)/(d*x+c)^2)-4/63/(-b*ln(F)/(d*x+c)^2)^(7/2)*exp(b*ln(F)/(d*x+c)^2)+2/9/(-
b*ln(F)/(d*x+c)^2)^(9/2)*exp(b*ln(F)/(d*x+c)^2))*(-b*ln(F)/(d*x+c)^2)^(9/2)
/d
```

Rubi [A]
time = 0.03, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$\frac{F^a(c+dx)^9\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{9/2}\text{Gamma}\left(-\frac{9}{2},-\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)*(c + d*x)^8,x]
```

```
[Out] (F^a*(c + d*x)^9*Gamma[-9/2, -((b*Log[F])/(c + d*x)^2)]*(-((b*Log[F])/(c +
d*x)^2))^(9/2))/(2*d)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^8\,dx=\frac{F^a(c+dx)^9\Gamma\left(-\frac{9}{2},-\frac{b\log(F)}{(c+dx)^2}\right)\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{9/2}}{2d}$$

Mathematica [**A**]
time = 0.02, size = 49, normalized size = 1.00

$$\frac{F^a(c+dx)^9\Gamma\left(-\frac{9}{2},-\frac{b\log(F)}{(c+dx)^2}\right)\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{9/2}}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)*(c + d*x)^8,x]
```

```
[Out] (F^a*(c + d*x)^9*Gamma[-9/2, -((b*Log[F])/(c + d*x)^2)]*(-((b*Log[F])/(c +
d*x)^2))^(9/2))/(2*d)
```

Maple [**B**] Leaf count of result is larger than twice the leaf count of optimal. 825 vs. $2(190) = 380$.
time = 0.10, size = 826, normalized size = 16.86

method	result
risch	$\frac{2F^a b\ln(F)F^{\frac{b}{(dx+c)^2}}c^7}{63d}+\frac{4F^a b^2\ln(F)^2F^{\frac{b}{(dx+c)^2}}c^5}{315d}+\frac{8F^a b^3\ln(F)^3F^{\frac{b}{(dx+c)^2}}c^3}{945d}+\frac{16F^a b^4\ln(F)^4F^{\frac{b}{(dx+c)^2}}c}{945d}+\frac{2F^a d^6 b\ln(F$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^2)*(d*x+c)^8,x,method=_RETURNVERBOSE)
```

```
[Out] 2/63*F^a/d*b*ln(F)*F^(b/(d*x+c)^2)*c^7+4/315*F^a/d*b^2*ln(F)^2*F^(b/(d*x+c)
^2)*c^5+8/945*F^a/d*b^3*ln(F)^3*F^(b/(d*x+c)^2)*c^3+16/945*F^a/d*b^4*ln(F)^
4*F^(b/(d*x+c)^2)*c+2/63*F^a*d^6*b*ln(F)*F^(b/(d*x+c)^2)*x^7+4/315*F^a*d^4*
b^2*ln(F)^2*F^(b/(d*x+c)^2)*x^5+8/945*F^a*d^2*b^3*ln(F)^3*F^(b/(d*x+c)^2)*x
^3+4/63*F^a*b^2*ln(F)^2*F^(b/(d*x+c)^2)*c^4*x+8/315*F^a*b^3*ln(F)^3*F^(b/(d
*x+c)^2)*c^2*x+2/9*F^a*b*ln(F)*F^(b/(d*x+c)^2)*c^6*x+2/3*F^a*d*b*ln(F)*F^(b
/(d*x+c)^2)*c^5*x^2+4/63*F^a*d^3*b^2*ln(F)^2*F^(b/(d*x+c)^2)*c*x^4+8/63*F^a
*d^2*b^2*ln(F)^2*F^(b/(d*x+c)^2)*c^2*x^3+8/63*F^a*d*b^2*ln(F)^2*F^(b/(d*x+c
)^2)*c^3*x^2-16/945*F^a/d*b^5*ln(F)^5*Pi^(1/2)/(-b*ln(F))^(1/2)*erf((-b*ln(
F))^(1/2)/(d*x+c))+8/315*F^a*d*b^3*ln(F)^3*F^(b/(d*x+c)^2)*c*x^2+2/9*F^a*d^
5*b*ln(F)*F^(b/(d*x+c)^2)*c*x^6+2/3*F^a*d^4*b*ln(F)*F^(b/(d*x+c)^2)*c^2*x^5
+10/9*F^a*d^3*b*ln(F)*F^(b/(d*x+c)^2)*c^3*x^4+10/9*F^a*d^2*b*ln(F)*F^(b/(d*
x+c)^2)*c^4*x^3+1/9*F^a/d*F^(b/(d*x+c)^2)*c^9+1/9*F^a*d^8*F^(b/(d*x+c)^2)*x
^9+F^a*F^(b/(d*x+c)^2)*c^8*x+4*F^a*d*F^(b/(d*x+c)^2)*c^7*x^2+16/945*F^a*b^4
*ln(F)^4*F^(b/(d*x+c)^2)*x+F^a*d^7*F^(b/(d*x+c)^2)*c*x^8+4*F^a*d^6*F^(b/(d*
x+c)^2)*c^2*x^7+28/3*F^a*d^5*F^(b/(d*x+c)^2)*c^3*x^6+14*F^a*d^4*F^(b/(d*x+c
)^2)*c^4*x^5+14*F^a*d^3*F^(b/(d*x+c)^2)*c^5*x^4+28/3*F^a*d^2*F^(b/(d*x+c)^2
)*c^6*x^3
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^8,x, algorithm="maxima")
```

```
[Out] 1/945*(105*F^a*d^8*x^9 + 945*F^a*c*d^7*x^8 + 30*(126*F^a*c^2*d^6 + F^a*b*d^
6*log(F))*x^7 + 210*(42*F^a*c^3*d^5 + F^a*b*c*d^5*log(F))*x^6 + 6*(2205*F^a
*c^4*d^4 + 105*F^a*b*c^2*d^4*log(F) + 2*F^a*b^2*d^4*log(F)^2)*x^5 + 30*(441
*F^a*c^5*d^3 + 35*F^a*b*c^3*d^3*log(F) + 2*F^a*b^2*c*d^3*log(F)^2)*x^4 + 2*
(4410*F^a*c^6*d^2 + 525*F^a*b*c^4*d^2*log(F) + 60*F^a*b^2*c^2*d^2*log(F)^2
+ 4*F^a*b^3*d^2*log(F)^3)*x^3 + 6*(630*F^a*c^7*d + 105*F^a*b*c^5*d*log(F) +
 20*F^a*b^2*c^3*d*log(F)^2 + 4*F^a*b^3*c*d*log(F)^3)*x^2 + (945*F^a*c^8 + 2
10*F^a*b*c^6*log(F) + 60*F^a*b^2*c^4*log(F)^2 + 24*F^a*b^3*c^2*log(F)^3 + 1
6*F^a*b^4*log(F)^4)*x)*F^(b/(d^2*x^2 + 2*c*d*x + c^2)) + integrate(2/945*(1
6*F^a*b^5*d*x*log(F)^5 - 105*F^a*b*c^9*log(F) - 30*F^a*b^2*c^7*log(F)^2 - 1
2*F^a*b^3*c^5*log(F)^3 - 8*F^a*b^4*c^3*log(F)^4)*F^(b/(d^2*x^2 + 2*c*d*x +
c^2))/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3), x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 413 vs. 2(185) = 370.
time = 0.39, size = 413, normalized size = 8.43

$$\frac{16\,\sqrt{\pi}\,F^{a}b^{4}d\sqrt{-\frac{b\log\left(F\right)}{d^{2}}}\operatorname{erf}\left(\frac{d\sqrt{-\frac{b\log\left(F\right)}{d^{2}}}}{dx+c}\right)\log\left(F\right)^{4}+\left(105\,d^{9}x^{9}+945\,cd^{8}x^{8}+3780\,c^{2}d^{7}x^{7}+8820\,c^{3}d^{6}x^{6}+13230\,c^{4}d^{5}x^{5}+13230\,c^{5}d^{4}x^{4}+8820\,c^{6}d^{3}x^{3}+3780\,c^{7}d^{2}x^{2}+945\,c^{8}dx+105\,c^{9}+16\left(b^{4}dx+b^{4}c\right)\log\left(F\right)^{4}+8\left(b^{3}d^{3}x^{3}+3\,b^{3}cd^{2}x^{2}+3\,b^{3}c^{2}dx+b^{3}c^{3}\right)\log\left(F\right)^{3}+12\left(b^{2}d^{5}x^{5}+5\,b^{2}cd^{4}x^{4}+10\,b^{2}c^{2}d^{3}x^{3}+10\,b^{2}c^{3}d^{2}x^{2}+5\,b^{2}c^{4}dx+b^{2}c^{5}\right)\log\left(F\right)^{2}+30\left(bd^{7}x^{7}+7\,bcd^{6}x^{6}+21\,bc^{2}d^{5}x^{5}+35\,bc^{3}d^{4}x^{4}+35\,bc^{4}d^{3}x^{3}+21\,bc^{5}d^{2}x^{2}+7\,bc^{6}dx+bc^{7}\right)\log\left(F\right)\right)F^{\frac{ad^{2}x^{2}+2\,acdx+ac^{2}+b}{d^{2}x^{2}+2\,cdx+c^{2}}}}{945\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^8,x, algorithm="fricas")
```

```
[Out] 1/945*(16*sqrt(pi)*F^a*b^4*d*sqrt(-b*log(F)/d^2)*erf(d*sqrt(-b*log(F)/d^2)/
(d*x + c))*log(F)^4 + (105*d^9*x^9 + 945*c*d^8*x^8 + 3780*c^2*d^7*x^7 + 882
0*c^3*d^6*x^6 + 13230*c^4*d^5*x^5 + 13230*c^5*d^4*x^4 + 8820*c^6*d^3*x^3 +
3780*c^7*d^2*x^2 + 945*c^8*d*x + 105*c^9 + 16*(b^4*d*x + b^4*c)*log(F)^4 +
8*(b^3*d^3*x^3 + 3*b^3*c*d^2*x^2 + 3*b^3*c^2*d*x + b^3*c^3)*log(F)^3 + 12*(
b^2*d^5*x^5 + 5*b^2*c*d^4*x^4 + 10*b^2*c^2*d^3*x^3 + 10*b^2*c^3*d^2*x^2 + 5
*b^2*c^4*d*x + b^2*c^5)*log(F)^2 + 30*(b*d^7*x^7 + 7*b*c*d^6*x^6 + 21*b*c^2
*d^5*x^5 + 35*b*c^3*d^4*x^4 + 35*b*c^4*d^3*x^3 + 21*b*c^5*d^2*x^2 + 7*b*c^6
*d*x + b*c^7)*log(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c
*d*x + c^2)))/d
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(c+dx)^2}}\left(c+dx\right)^8\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)*(d*x+c)**8,x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**2)*(c + d*x)**8, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^8,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^8*F^(a + b/(d*x + c)^2), x)
```

Mupad [B]
time = 4.17, size = 232, normalized size = 4.73

$$\frac{F^a\,F^{\frac{b}{{(c+d\,x)}^2}}\,{\left(c+d\,x\right)}^9}{9\,d}+\frac{16\,F^a\,\sqrt{\pi }\,{\left(c+d\,x\right)}^9\,{\left(-\frac{b\,\ln(F)}{{(c+d\,x)}^2}\right)}^{9/2}}{945\,d}+\frac{4\,F^a\,F^{\frac{b}{{(c+d\,x)}^2}}\,b^2\,{\ln\left(F\right)}^2\,{\left(c+d\,x\right)}^5}{315\,d}+\frac{8\,F^a\,F^{\frac{b}{{(c+d\,x)}^2}}\,b^3\,{\ln\left(F\right)}^3\,{\left(c+d\,x\right)}^3}{945\,d}+\frac{2\,F^a\,F^{\frac{b}{{(c+d\,x)}^2}}\,b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^7}{63\,d}+\frac{16\,F^a\,F^{\frac{b}{{(c+d\,x)}^2}}\,b^4\,{\ln\left(F\right)}^4\,\left(c+d\,x\right)}{945\,d}-\frac{16\,F^a\,\sqrt{\pi }\,\mathrm{erfc}\left(\sqrt{-\frac{b\,\ln\left(F\right)}{{\left(c+d\,x\right)}^2}}\right)\,{\left(c+d\,x\right)}^9\,{\left(-\frac{b\,\ln(F)}{{(c+d\,x)}^2}\right)}^{9/2}}{945\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)*(c + d*x)^8,x)
```

```
[Out] (F^a*F^(b/(c + d*x)^2)*(c + d*x)^9)/(9*d) + (16*F^a*pi^(1/2)*(c + d*x)^9*(-
(b*log(F))/(c + d*x)^2)^(9/2))/(945*d) + (4*F^a*F^(b/(c + d*x)^2)*b^2*log(F
)^2*(c + d*x)^5)/(315*d) + (8*F^a*F^(b/(c + d*x)^2)*b^3*log(F)^3*(c + d*x)^
3)/(945*d) + (2*F^a*F^(b/(c + d*x)^2)*b*log(F)*(c + d*x)^7)/(63*d) + (16*F^
a*F^(b/(c + d*x)^2)*b^4*log(F)^4*(c + d*x))/(945*d) - (16*F^a*pi^(1/2)*erfc
((-(b*log(F))/(c + d*x)^2)^(1/2))*(c + d*x)^9*(-(b*log(F))/(c + d*x)^2)^(9/
2))/(945*d)
```

3.329 $\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^6\,dx$

Optimal. Leaf size=170

$$\frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^7}{7d}+\frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^5\log(F)}{35d}+\frac{4b^2F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\log^2(F)}{105d}+\frac{8b^3F^{a+\frac{b}{(c+dx)^2}}(c+dx)\,\mathrm{lo}}{105d}$$

```
[Out] 1/7*F^(a+b/(d*x+c)^2)*(d*x+c)^7/d+2/35*b*F^(a+b/(d*x+c)^2)*(d*x+c)^5*ln(F)/
d+4/105*b^2*F^(a+b/(d*x+c)^2)*(d*x+c)^3*ln(F)^2/d+8/105*b^3*F^(a+b/(d*x+c)^
2)*(d*x+c)*ln(F)^3/d-8/105*b^(7/2)*F^a*erfi(b^(1/2)*ln(F)^(1/2)/(d*x+c))*ln
(F)^(7/2)*Pi^(1/2)/d
```

Rubi [A]
time = 0.17, antiderivative size = 170, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.190$, Rules used = {2245, 2237, 2242, 2235}

$$-\frac{8\sqrt{\pi}\,b^{7/2}F^a\log^{\frac{7}{2}}(F)\,\mathrm{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{105d}+\frac{8b^3\log^3(F)(c+dx)F^{a+\frac{b}{(c+dx)^2}}}{105d}+\frac{4b^2\log^2(F)(c+dx)^3F^{a+\frac{b}{(c+dx)^2}}}{105d}+\frac{(c+dx)^7F^{a+\frac{b}{(c+dx)^2}}}{7d}+\frac{2b\log(F)(c+dx)^5F^{a+\frac{b}{(c+dx)^2}}}{35d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)*(c + d*x)^6,x]
```

```
[Out] (F^(a + b/(c + d*x)^2)*(c + d*x)^7)/(7*d) + (2*b*F^(a + b/(c + d*x)^2)*(c +
 d*x)^5*Log[F])/(35*d) + (4*b^2*F^(a + b/(c + d*x)^2)*(c + d*x)^3*Log[F]^2)
/(105*d) + (8*b^3*F^(a + b/(c + d*x)^2)*(c + d*x)*Log[F]^3)/(105*d) - (8*b^
(7/2)*F^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)]*Log[F]^(7/2))/(10
5*d)
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
```

```
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^6\,dx = \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^7}{7d} + \frac{1}{7}(2b\log(F))\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^4\,dx$$

$$= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^7}{7d} + \frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^5\log(F)}{35d} + \frac{1}{35}\left(4b^2\log^2(F)\right)\int F^{a+}$$

$$= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^7}{7d} + \frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^5\log(F)}{35d} + \frac{4b^2F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\,\mathrm{lo}}{105d}$$

$$= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^7}{7d} + \frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^5\log(F)}{35d} + \frac{4b^2F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\,\mathrm{lo}}{105d}$$

$$= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^7}{7d} + \frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^5\log(F)}{35d} + \frac{4b^2F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\,\mathrm{lo}}{105d}$$

$$= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^7}{7d} + \frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^5\log(F)}{35d} + \frac{4b^2F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\,\mathrm{lo}}{105d}$$

Mathematica [A]
time = 0.09, size = 113, normalized size = 0.66

$$\frac{F^a\left(-8b^{7/2}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)\log^{\frac{7}{2}}(F)+F^{\frac{b}{(c+dx)^2}}(c+dx)\left(15(c+dx)^6+6b(c+dx)^4\log(F)+4b^2(c+dx)^2\log^2(F)+8b^3\log^3(F)\right)\right)}{105d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)*(c + d*x)^6,x]
```

```
[Out] (F^a*(-8*b^(7/2)*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)]*Log[F]^(7/
2) + F^(b/(c + d*x)^2)*(c + d*x)*(15*(c + d*x)^6 + 6*b*(c + d*x)^4*Log[F] +
 4*b^2*(c + d*x)^2*Log[F]^2 + 8*b^3*Log[F]^3)))/(105*d)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 542 vs. $2(150) = 300$.
time = 0.10, size = 543, normalized size = 3.19

method	result
risch	$\frac{F^{a} d^{6} F^{\frac{b}{(dx+c)^{2}}} x^{7}}{7}+F^{a} d^{5} F^{\frac{b}{(dx+c)^{2}}} c\,x^{6}+3 F^{a} d^{4} F^{\frac{b}{(dx+c)^{2}}} c^{2} x^{5}+5 F^{a} d^{3} F^{\frac{b}{(dx+c)^{2}}} c^{3} x^{4}+5 F^{a} d^{2} F^{\frac{b}{(dx+c)^{2}}} c^{4} x^{3}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^2)*(d*x+c)^6,x,method=_RETURNVERBOSE)
```

```
[Out] 1/7*F^a*d^6*F^(b/(d*x+c)^2)*x^7+F^a*d^5*F^(b/(d*x+c)^2)*c*x^6+3*F^a*d^4*F^(
b/(d*x+c)^2)*c^2*x^5+5*F^a*d^3*F^(b/(d*x+c)^2)*c^3*x^4+5*F^a*d^2*F^(b/(d*x+
c)^2)*c^4*x^3+3*F^a*d*F^(b/(d*x+c)^2)*c^5*x^2+F^a*F^(b/(d*x+c)^2)*c^6*x+1/7
*F^a/d*F^(b/(d*x+c)^2)*c^7+2/35*F^a*d^4*b*ln(F)*F^(b/(d*x+c)^2)*x^5+2/7*F^a
*d^3*b*ln(F)*F^(b/(d*x+c)^2)*c*x^4+4/7*F^a*d^2*b*ln(F)*F^(b/(d*x+c)^2)*c^2*
x^3+4/7*F^a*d*b*ln(F)*F^(b/(d*x+c)^2)*c^3*x^2+2/7*F^a*b*ln(F)*F^(b/(d*x+c)^
2)*c^4*x+2/35*F^a/d*b*ln(F)*F^(b/(d*x+c)^2)*c^5+4/105*F^a*d^2*b^2*ln(F)^2*F
^(b/(d*x+c)^2)*x^3+4/35*F^a*d*b^2*ln(F)^2*F^(b/(d*x+c)^2)*c*x^2+4/35*F^a*b^
2*ln(F)^2*F^(b/(d*x+c)^2)*c^2*x+4/105*F^a/d*b^2*ln(F)^2*F^(b/(d*x+c)^2)*c^3
+8/105*F^a*b^3*ln(F)^3*F^(b/(d*x+c)^2)*x+8/105*F^a/d*b^3*ln(F)^3*F^(b/(d*x+
c)^2)*c-8/105*F^a/d*b^4*ln(F)^4*Pi^(1/2)/(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1
/2)/(d*x+c))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^6,x, algorithm="maxima")
```

```
[Out] 1/105*(15*F^a*d^6*x^7 + 105*F^a*c*d^5*x^6 + 3*(105*F^a*c^2*d^4 + 2*F^a*b*d^
4*log(F))*x^5 + 15*(35*F^a*c^3*d^3 + 2*F^a*b*c*d^3*log(F))*x^4 + (525*F^a*c
^4*d^2 + 60*F^a*b*c^2*d^2*log(F) + 4*F^a*b^2*d^2*log(F)^2)*x^3 + 3*(105*F^a
*c^5*d + 20*F^a*b*c^3*d*log(F) + 4*F^a*b^2*c*d*log(F)^2)*x^2 + (105*F^a*c^6
 + 30*F^a*b*c^4*log(F) + 12*F^a*b^2*c^2*log(F)^2 + 8*F^a*b^3*log(F)^3)*x)*F
^(b/(d^2*x^2 + 2*c*d*x + c^2)) + integrate(2/105*(8*F^a*b^4*d*x*log(F)^4 -
15*F^a*b*c^7*log(F) - 6*F^a*b^2*c^5*log(F)^2 - 4*F^a*b^3*c^3*log(F)^3)*F^(b
/(d^2*x^2 + 2*c*d*x + c^2))/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3), x)
```

Fricas [A]
time = 0.36, size = 293, normalized size = 1.72

$$\frac{8\,\sqrt{\pi}\,F^{a} b^{3} d \sqrt{-\frac{b \log\left(F\right)}{d^{2}}}\,\mathrm{erf}\left(\frac{d \sqrt{-\frac{b \log\left(F\right)}{d^{2}}}}{dx+c}\right) \log\left(F\right)^{3} + \left(15\,d^{7} x^{7} + 105\,c d^{6} x^{6} + 315\,c^{2} d^{5} x^{5} + 525\,c^{3} d^{4} x^{4} + 525\,c^{4} d^{3} x^{3} + 315\,c^{5} d^{2} x^{2} + 105\,c^{6} d x + 15\,c^{7} + 8\left(b^{3} d x + b^{3} c\right) \log\left(F\right)^{3} + 4\left(b^{2} d^{3} x^{3} + 3\,b^{2} c d^{2} x^{2} + 3\,b^{2} c^{2} d x + b^{2} c^{3}\right) \log\left(F\right)^{2} + 6\left(b d^{5} x^{5} + 5\,b c d^{4} x^{4} + 10\,b c^{2} d^{3} x^{3} + 10\,b c^{3} d^{2} x^{2} + 5\,b c^{4} d x + b c^{5}\right) \log\left(F\right)\right) F^{\frac{a d^{2} x^{2} + 2\,a c d x + a c^{2} + b}{d^{2} x^{2} + 2\,c d x + c^{2}}}}{105\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^6,x, algorithm="fricas")
```

```
[Out] 1/105*(8*sqrt(pi)*F^a*b^3*d*sqrt(-b*log(F)/d^2)*erf(d*sqrt(-b*log(F)/d^2)/(
d*x + c))*log(F)^3 + (15*d^7*x^7 + 105*c*d^6*x^6 + 315*c^2*d^5*x^5 + 525*c^
3*d^4*x^4 + 525*c^4*d^3*x^3 + 315*c^5*d^2*x^2 + 105*c^6*d*x + 15*c^7 + 8*(b
^3*d*x + b^3*c)*log(F)^3 + 4*(b^2*d^3*x^3 + 3*b^2*c*d^2*x^2 + 3*b^2*c^2*d*x
 + b^2*c^3)*log(F)^2 + 6*(b*d^5*x^5 + 5*b*c*d^4*x^4 + 10*b*c^2*d^3*x^3 + 10
*b*c^3*d^2*x^2 + 5*b*c^4*d*x + b*c^5)*log(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a
*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2)))/d
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^6\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)*(d*x+c)**6,x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**2)*(c + d*x)**6, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^6,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^6*F^(a + b/(d*x + c)^2), x)
```

Mupad [B]
time = 4.41, size = 199, normalized size = 1.17

$$\frac{F^a\,F^{\frac{b}{(c+d\,x)^2}}\,(c+d\,x)^7}{7\,d}-\frac{8\,F^a\,\sqrt{\pi }\,(c+d\,x)^7\,\left(-\frac{b\,\ln(F)}{(c+d\,x)^2}\right)^{7/2}}{105\,d}+\frac{4\,F^a\,F^{\frac{b}{(c+d\,x)^2}}\,b^2\,\ln\left(F\right)^2\,(c+d\,x)^3}{105\,d}+\frac{2\,F^a\,F^{\frac{b}{(c+d\,x)^2}}\,b\,\ln\left(F\right)\,(c+d\,x)^5}{35\,d}+\frac{8\,F^a\,F^{\frac{b}{(c+d\,x)^2}}\,b^3\,\ln\left(F\right)^3\,(c+d\,x)}{105\,d}+\frac{8\,F^a\,\sqrt{\pi }\,\mathrm{erfc}\left(\sqrt{-\frac{b\,\ln\left(F\right)}{(c+d\,x)^2}}\right)\,(c+d\,x)^7\,\left(-\frac{b\,\ln(F)}{(c+d\,x)^2}\right)^{7/2}}{105\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)*(c + d*x)^6,x)
```

```
[Out] (F^a*F^(b/(c + d*x)^2)*(c + d*x)^7)/(7*d) - (8*F^a*pi^(1/2)*(c + d*x)^7*(-(
b*log(F))/(c + d*x)^2)^(7/2))/(105*d) + (4*F^a*F^(b/(c + d*x)^2)*b^2*log(F)
^2*(c + d*x)^3)/(105*d) + (2*F^a*F^(b/(c + d*x)^2)*b*log(F)*(c + d*x)^5)/(3
5*d) + (8*F^a*F^(b/(c + d*x)^2)*b^3*log(F)^3*(c + d*x))/(105*d) + (8*F^a*pi
^(1/2)*erfc((-(b*log(F))/(c + d*x)^2)^(1/2))*(c + d*x)^7*(-(b*log(F))/(c +
d*x)^2)^(7/2))/(105*d)
```

3.330 $\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^4\,dx$

Optimal. Leaf size=136

$$\frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^5}{5d}+\frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\log(F)}{15d}+\frac{4b^2F^{a+\frac{b}{(c+dx)^2}}(c+dx)\log^2(F)}{15d}-\frac{4b^{5/2}F^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\,\sqrt{\cdots}}{c+\cdots}\right)\cdots}{15d}$$

```
[Out] 1/5*F^(a+b/(d*x+c)^2)*(d*x+c)^5/d+2/15*b*F^(a+b/(d*x+c)^2)*(d*x+c)^3*ln(F)/
d+4/15*b^2*F^(a+b/(d*x+c)^2)*(d*x+c)*ln(F)^2/d-4/15*b^(5/2)*F^a*erfi(b^(1/2
)*ln(F)^(1/2)/(d*x+c))*ln(F)^(5/2)*Pi^(1/2)/d
```

Rubi [A]
time = 0.12, antiderivative size = 136, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2245, 2237, 2242, 2235}

$$-\frac{4\sqrt{\pi}\,b^{5/2}F^a\log^{\frac{5}{2}}(F)\mathrm{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{15d}+\frac{4b^2\log^2(F)(c+dx)F^{a+\frac{b}{(c+dx)^2}}}{15d}+\frac{(c+dx)^5F^{a+\frac{b}{(c+dx)^2}}}{5d}+\frac{2b\log(F)(c+dx)^3F^{a+\frac{b}{(c+dx)^2}}}{15d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)*(c + d*x)^4,x]
```

```
[Out] (F^(a + b/(c + d*x)^2)*(c + d*x)^5)/(5*d) + (2*b*F^(a + b/(c + d*x)^2)*(c +
 d*x)^3*Log[F])/(15*d) + (4*b^2*F^(a + b/(c + d*x)^2)*(c + d*x)*Log[F]^2)/(
15*d) - (4*b^(5/2)*F^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)]*Log[
F]^(5/2))/(15*d)
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
```

```
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^4\,dx &= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^5}{5d}+\frac{1}{5}(2b\log(F))\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^2\,dx\\ &= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^5}{5d}+\frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\log(F)}{15d}+\frac{1}{15}\left(4b^2\log^2(F)\right)\int F^{a+\frac{}{(}}\\ &= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^5}{5d}+\frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\log(F)}{15d}+\frac{4b^2F^{a+\frac{b}{(c+dx)^2}}(c+dx)\log}{15d}\\ &= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^5}{5d}+\frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\log(F)}{15d}+\frac{4b^2F^{a+\frac{b}{(c+dx)^2}}(c+dx)\log}{15d}\\ &= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^5}{5d}+\frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\log(F)}{15d}+\frac{4b^2F^{a+\frac{b}{(c+dx)^2}}(c+dx)\log}{15d}\end{aligned}$$

Mathematica [**A**]
time = 0.07, size = 97, normalized size = 0.71

$$\frac{F^a\left(-4b^{5/2}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)\log^{\frac{5}{2}}(F)+F^{\frac{b}{(c+dx)^2}}(c+dx)\left(3(c+dx)^4+2b(c+dx)^2\log(F)+4b^2\log^2(F)\right)\right)}{15d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)*(c + d*x)^4,x]
```

```
[Out] (F^a*(-4*b^(5/2)*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)]*Log[F]^(5/
2) + F^(b/(c + d*x)^2)*(c + d*x)*(3*(c + d*x)^4 + 2*b*(c + d*x)^2*Log[F] +
4*b^2*Log[F]^2)))/(15*d)
```

Maple [**B**] Leaf count of result is larger than twice the leaf count of optimal. 323 vs. 2(118) = 236.
time = 0.08, size = 324, normalized size = 2.38

method	result
risch	$\frac{F^{a} d^{4} F^{\frac{b}{(dx+c)^{2}}} x^{5}}{5}+F^{a} d^{3} F^{\frac{b}{(dx+c)^{2}}} c\,x^{4}+2 F^{a} d^{2} F^{\frac{b}{(dx+c)^{2}}} c^{2} x^{3}+2 F^{a} d\,F^{\frac{b}{(dx+c)^{2}}} c^{3} x^{2}+F^{a} F^{\frac{b}{(dx+c)^{2}}} c^{4} x+\frac{F^{a}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^2)*(d*x+c)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/5*F^a*d^4*F^(b/(d*x+c)^2)*x^5+F^a*d^3*F^(b/(d*x+c)^2)*c*x^4+2*F^a*d^2*F^(
b/(d*x+c)^2)*c^2*x^3+2*F^a*d*F^(b/(d*x+c)^2)*c^3*x^2+F^a*F^(b/(d*x+c)^2)*c^
4*x+1/5*F^a/d*F^(b/(d*x+c)^2)*c^5+2/15*F^a*d^2*b*ln(F)*F^(b/(d*x+c)^2)*x^3+
2/5*F^a*d*b*ln(F)*F^(b/(d*x+c)^2)*c*x^2+2/5*F^a*b*ln(F)*F^(b/(d*x+c)^2)*c^2
*x+2/15*F^a/d*b*ln(F)*F^(b/(d*x+c)^2)*c^3+4/15*F^a*b^2*ln(F)^2*F^(b/(d*x+c)
^2)*x+4/15*F^a/d*b^2*ln(F)^2*F^(b/(d*x+c)^2)*c-4/15*F^a/d*b^3*ln(F)^3*Pi^(1
/2)/(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1/2)/(d*x+c))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^4,x, algorithm="maxima")
```

```
[Out] 1/15*(3*F^a*d^4*x^5 + 15*F^a*c*d^3*x^4 + 2*(15*F^a*c^2*d^2 + F^a*b*d^2*log(
F))*x^3 + 6*(5*F^a*c^3*d + F^a*b*c*d*log(F))*x^2 + (15*F^a*c^4 + 6*F^a*b*c^
2*log(F) + 4*F^a*b^2*log(F)^2)*x)*F^(b/(d^2*x^2 + 2*c*d*x + c^2)) + integra
te(2/15*(4*F^a*b^3*d*x*log(F)^3 - 3*F^a*b*c^5*log(F) - 2*F^a*b^2*c^3*log(F)
^2)*F^(b/(d^2*x^2 + 2*c*d*x + c^2))/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^
3), x)
```

Fricas [A]
time = 0.36, size = 201, normalized size = 1.48

$$\frac{4\,\sqrt{\pi}\,F^{a} b^{2} d \sqrt{-\frac{b \log\left(F\right)}{d^{2}}} \operatorname{erf}\left(\frac{d \sqrt{-\frac{b \log\left(F\right)}{d^{2}}}}{dx+c}\right) \log\left(F\right)^{2} + \left(3\,d^{5} x^{5} + 15\,c d^{4} x^{4} + 30\,c^{2} d^{3} x^{3} + 30\,c^{3} d^{2} x^{2} + 15\,c^{4} dx + 3\,c^{5} + 4\,\left(b^{2} dx + b^{2} c\right) \log\left(F\right)^{2} + 2\,\left(b d^{3} x^{3} + 3\,b c d^{2} x^{2} + 3\,b c^{2} dx + b c^{3}\right) \log\left(F\right)\right) F^{\frac{a d^{2} x^{2} + 2\,a c d x + a c^{2} + b}{d^{2} x^{2} + 2\,c d x + c^{2}}}}{15\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] 1/15*(4*sqrt(pi)*F^a*b^2*d*sqrt(-b*log(F)/d^2)*erf(d*sqrt(-b*log(F)/d^2)/(d
*x + c))*log(F)^2 + (3*d^5*x^5 + 15*c*d^4*x^4 + 30*c^2*d^3*x^3 + 30*c^3*d^2
*x^2 + 15*c^4*d*x + 3*c^5 + 4*(b^2*d*x + b^2*c)*log(F)^2 + 2*(b*d^3*x^3 + 3
```

```
*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c
^2 + b)/(d^2*x^2 + 2*c*d*x + c^2)))/d
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)*(d*x+c)**4,x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**2)*(c + d*x)**4, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^4,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^4*F^(a + b/(d*x + c)^2), x)
```

Mupad [B]
time = 4.01, size = 166, normalized size = 1.22

$$\frac{F^a\,F^{\frac{b}{{\left(c+d\,x\right)}^2}}\,{\left(c+d\,x\right)}^5}{5\,d}+\frac{4\,F^a\,\sqrt{\pi}\,{\left(c+d\,x\right)}^5\,{\left(-\frac{b\,\ln(F)}{{\left(c+d\,x\right)}^2}\right)}^{5/2}}{15\,d}+\frac{2\,F^a\,F^{\frac{b}{{\left(c+d\,x\right)}^2}}\,b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^3}{15\,d}+\frac{4\,F^a\,F^{\frac{b}{{\left(c+d\,x\right)}^2}}\,b^2\,{\ln\left(F\right)}^2\,\left(c+d\,x\right)}{15\,d}-\frac{4\,F^a\,\sqrt{\pi}\,\mathrm{erfc}\left(\sqrt{-\frac{b\,\ln\left(F\right)}{{\left(c+d\,x\right)}^2}}\right)\,{\left(c+d\,x\right)}^5\,{\left(-\frac{b\,\ln(F)}{{\left(c+d\,x\right)}^2}\right)}^{5/2}}{15\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)*(c + d*x)^4,x)
```

```
[Out] (F^a*F^(b/(c + d*x)^2)*(c + d*x)^5)/(5*d) + (4*F^a*pi^(1/2)*(c + d*x)^5*(-(
b*log(F))/(c + d*x)^2)^(5/2))/(15*d) + (2*F^a*F^(b/(c + d*x)^2)*b*log(F)*(c
 + d*x)^3)/(15*d) + (4*F^a*F^(b/(c + d*x)^2)*b^2*log(F)^2*(c + d*x))/(15*d)
 - (4*F^a*pi^(1/2)*erfc((-(b*log(F))/(c + d*x)^2)^(1/2))*(c + d*x)^5*(-(b*l
og(F))/(c + d*x)^2)^(5/2))/(15*d)
```

3.331 $\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^2\,dx$

Optimal. Leaf size=102

$$\frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3}{3d}+\frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)\log(F)}{3d}-\frac{2b^{3/2}F^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)\log^{\frac{3}{2}}(F)}{3d}$$

```
[Out] 1/3*F^(a+b/(d*x+c)^2)*(d*x+c)^3/d+2/3*b*F^(a+b/(d*x+c)^2)*(d*x+c)*ln(F)/d-2
/3*b^(3/2)*F^a*erfi(b^(1/2)*ln(F)^(1/2)/(d*x+c))*ln(F)^(3/2)*Pi^(1/2)/d
```

Rubi [A]
time = 0.08, antiderivative size = 102, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.190$, Rules used = {2245, 2237, 2242, 2235}

$$-\frac{2\sqrt{\pi}\,b^{3/2}F^a\log^{\frac{3}{2}}(F)\text{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{3d}+\frac{(c+dx)^3F^{a+\frac{b}{(c+dx)^2}}}{3d}+\frac{2b\log(F)(c+dx)F^{a+\frac{b}{(c+dx)^2}}}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)*(c + d*x)^2,x]
```

```
[Out] (F^(a + b/(c + d*x)^2)*(c + d*x)^3)/(3*d) + (2*b*F^(a + b/(c + d*x)^2)*(c +
 d*x)*Log[F])/(3*d) - (2*b^(3/2)*F^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(
c + d*x)]*Log[F]^(3/2))/(3*d)
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^2\,dx = \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3}{3d}+\frac{1}{3}(2b\log(F))\int F^{a+\frac{b}{(c+dx)^2}}\,dx$$

$$= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3}{3d}+\frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)\log(F)}{3d}+\frac{1}{3}\left(4b^2\log^2(F)\right)\int \frac{F^{a+\frac{b}{(c+}}}{(c+d}$$

$$= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3}{3d}+\frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)\log(F)}{3d}-\frac{\left(4b^2\log^2(F)\right)\text{Subst}\left(\int F\right.}{3d}$$

$$= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3}{3d}+\frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)\log(F)}{3d}-\frac{2b^{3/2}F^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\sqrt{\text{l}}}{c+}\right.}{3d}$$

Mathematica [A]
time = 0.06, size = 79, normalized size = 0.77

$$\frac{F^a\left(-2b^{3/2}\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right)\log^{\frac{3}{2}}(F)+F^{\frac{b}{(c+dx)^2}}(c+dx)\left((c+dx)^2+2b\log(F)\right)\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)*(c + d*x)^2,x]
```

```
[Out] (F^a*(-2*b^(3/2)*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)]*Log[F]^(3/
2) + F^(b/(c + d*x)^2)*(c + d*x)*((c + d*x)^2 + 2*b*Log[F])))/(3*d)
```

Maple [A]
time = 0.08, size = 169, normalized size = 1.66

method	result

risch	$\frac{F^a d^2 F^{\frac{b}{(dx+c)^2}} x^3}{3} + F^a d F^{\frac{b}{(dx+c)^2}} c x^2 + F^a F^{\frac{b}{(dx+c)^2}} c^2 x + \frac{F^a F^{\frac{b}{(dx+c)^2}} c^3}{3d} + \frac{2F^a b \ln(F) F^{\frac{b}{(dx+c)^2}} x}{3} + \frac{2F^a b \ln(F) F^{(}}{3d}$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a+b/(d*x+c)^2)*(d*x+c)^2,x,method=_RETURNVERBOSE)

[Out] 1/3*F^a*d^2*F^(b/(d*x+c)^2)*x^3+F^a*d*F^(b/(d*x+c)^2)*c*x^2+F^a*F^(b/(d*x+c)^2)*c^2*x+1/3*F^a/d*F^(b/(d*x+c)^2)*c^3+2/3*F^a*b*ln(F)*F^(b/(d*x+c)^2)*x+2/3*F^a/d*b*ln(F)*F^(b/(d*x+c)^2)*c-2/3*F^a/d*b^2*ln(F)^2*Pi^(1/2)/(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1/2)/(d*x+c))

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^2,x, algorithm="maxima")

[Out] 1/3*(F^a*d^2*x^3 + 3*F^a*c*d*x^2 + (3*F^a*c^2 + 2*F^a*b*log(F))*x)*F^(b/(d^2*x^2 + 2*c*d*x + c^2)) + integrate(2/3*(2*F^a*b^2*d*x*log(F)^2 - F^a*b*c^3*log(F))*F^(b/(d^2*x^2 + 2*c*d*x + c^2))/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3), x)

Fricas [A]
time = 0.40, size = 130, normalized size = 1.27

$$\frac{2\sqrt{\pi}F^a bd\sqrt{-\frac{b\log(F)}{d^2}}\operatorname{erf}\left(\frac{d\sqrt{-\frac{b\log(F)}{d^2}}}{dx+c}\right)\log(F) + \left(d^3x^3 + 3cd^2x^2 + 3c^2dx + c^3 + 2(bdx+bc)\log(F)\right)F^{\frac{ad^2x^2+2acdx+ac^2+b}{d^2x^2+2cdx+c^2}}}{3d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^2,x, algorithm="fricas")

[Out] 1/3*(2*sqrt(pi)*F^a*b*d*sqrt(-b*log(F)/d^2)*erf(d*sqrt(-b*log(F)/d^2)/(d*x + c))*log(F) + (d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3 + 2*(b*d*x + b*c)*log(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2)))/d

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)*(d*x+c)**2,x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**2)*(c + d*x)**2, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^2,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^2*F^(a + b/(d*x + c)^2), x)
```

Mupad [B]
time = 4.00, size = 97, normalized size = 0.95

$$\frac{\left(\frac{F^a\,F^{\frac{b}{{\left(c+d\,x\right)}^2}}}{3}+\frac{2\,F^a\,F^{\frac{b}{{\left(c+d\,x\right)}^2}}\,b\,\ln(F)}{3\,{\left(c+d\,x\right)}^2}\right)\,{\left(c+d\,x\right)}^3}{d}-\frac{2\,F^a\,b^2\,\sqrt{\pi }\,\mathrm{erfi}\left(\frac{b\,\ln(F)}{\sqrt{b\,\ln\left(F\right)}\,\left(c+d\,x\right)}\right)\,{\ln\left(F\right)}^2}{3\,d\,\sqrt{b\,\ln\left(F\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)*(c + d*x)^2,x)
```

```
[Out] (((F^a*F^(b/(c + d*x)^2))/3 + (2*F^a*F^(b/(c + d*x)^2)*b*log(F))/(3*(c + d*
x)^2))*(c + d*x)^3)/d - (2*F^a*b^2*pi^(1/2)*erfi((b*log(F))/((b*log(F))^(1/
2)*(c + d*x)))*log(F)^2)/(3*d*(b*log(F))^(1/2))
```

3.332 $\int F^{a+\frac{b}{(c+dx)^2}}\,dx$

Optimal. Leaf size=67

$$\frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)}{d}-\frac{\sqrt{b}\,F^a\sqrt{\pi}\,\operatorname{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)\sqrt{\log(F)}}{d}$$

```
[Out] F^(a+b/(d*x+c)^2)*(d*x+c)/d-F^a*erfi(b^(1/2)*ln(F)^(1/2)/(d*x+c))*b^(1/2)*P
i^(1/2)*ln(F)^(1/2)/d
```

Rubi [A]
time = 0.05, antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}=0.231$, Rules used = {2237, 2242, 2235}

$$\frac{(c+dx)F^{a+\frac{b}{(c+dx)^2}}}{d}-\frac{\sqrt{\pi}\,\sqrt{b}\,F^a\sqrt{\log(F)}\,\operatorname{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2),x]
```

```
[Out] (F^(a + b/(c + d*x)^2)*(c + d*x))/d - (Sqrt[b]*F^a*Sqrt[Pi]*Erfi[(Sqrt[b]*S
qrt[Log[F]])/(c + d*x)]*Sqrt[Log[F]])/d
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^2}}\,dx = \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)}{d} + (2b\log(F))\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^2}\,dx$$
$$= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)}{d} - \frac{(2b\log(F))\text{Subst}\left(\int F^{a+bx^2}\,dx, x, \frac{1}{c+dx}\right)}{d}$$
$$= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)}{d} - \frac{\sqrt{b}\,F^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)\sqrt{\log(F)}}{d}$$

Mathematica [A]
time = 0.03, size = 63, normalized size = 0.94

$$\frac{F^a\left(F^{\frac{b}{(c+dx)^2}}(c+dx) - \sqrt{b}\,\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)\sqrt{\log(F)}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2),x]
```

```
[Out] (F^a*(F^(b/(c + d*x)^2)*(c + d*x) - Sqrt[b]*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log
[F]])/(c + d*x)]*Sqrt[Log[F]]))/d
```

Maple [A]
time = 0.02, size = 74, normalized size = 1.10

method	result	size
risch	$F^a F^{\frac{b}{(dx+c)^2}} x + \frac{F^a F^{\frac{b}{(dx+c)^2}} c}{d} - \frac{F^a b \ln(F)\sqrt{\pi}\ \text{erf}\left(\frac{\sqrt{-b\ln(F)}}{dx+c}\right)}{d\sqrt{-b\ln(F)}}$	74

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^2),x,method=_RETURNVERBOSE)
```

```
[Out] F^a*F^(b/(d*x+c)^2)*x+1/d*F^a*F^(b/(d*x+c)^2)*c-1/d*F^a*b*ln(F)*Pi^(1/2)/(-
b*ln(F))^(1/2)*erf((-b*ln(F))^(1/2)/(d*x+c))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2),x, algorithm="maxima")
```

```
[Out] 2*F^a*b*d*integrate(F^(b/(d^2*x^2 + 2*c*d*x + c^2))*x/(d^3*x^3 + 3*c*d^2*x^
2 + 3*c^2*d*x + c^3), x)*log(F) + F^a*F^(b/(d^2*x^2 + 2*c*d*x + c^2))*x
```

Fricas [A]
time = 0.37, size = 91, normalized size = 1.36

$$\frac{\sqrt{\pi}\,F^a d\sqrt{-\frac{b\log(F)}{d^2}}\,\operatorname{erf}\left(\frac{d\sqrt{-\frac{b\log(F)}{d^2}}}{dx+c}\right)+(dx+c)F^{\frac{ad^2x^2+2\,acdx+ac^2+b}{d^2x^2+2\,cdx+c^2}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2),x, algorithm="fricas")
```

```
[Out] (sqrt(pi)*F^a*d*sqrt(-b*log(F)/d^2)*erf(d*sqrt(-b*log(F)/d^2)/(d*x + c)) +
(d*x + c)*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2))
)/d
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(c+dx)^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2),x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2),x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2), x)
```

Mupad [B]
time = 4.77, size = 62, normalized size = 0.93

$$\frac{F^a\,F^{\frac{b}{(c+d\,x)^2}}\,(c+d\,x)}{d}-\frac{F^a\,b\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b\,\ln(F)}{\sqrt{b\,\ln(F)}\,(c+d\,x)}\right)\,\ln(F)}{d\,\sqrt{b\,\ln(F)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2),x)
```

```
[Out] (F^a*F^(b/(c + d*x)^2)*(c + d*x))/d - (F^a*b*pi^(1/2)*erfi((b*log(F))/((b*l
og(F))^(1/2)*(c + d*x)))*log(F))/(d*(b*log(F))^(1/2))
```

3.333 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^2}\,dx$

Optimal. Leaf size=46

$$-\frac{F^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{2\sqrt{b}\,d\sqrt{\log(F)}}$$

```
[Out] -1/2*F^a*erfi(b^(1/2)*ln(F)^(1/2)/(d*x+c))*Pi^(1/2)/d/b^(1/2)/ln(F)^(1/2)
```

Rubi [A]
time = 0.04, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2242, 2235}

$$-\frac{\sqrt{\pi}\,F^a\mathrm{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{2\sqrt{b}\,d\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^2,x]
```

```
[Out] -1/2*(F^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)])/(Sqrt[b]*d*Sqrt[
Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rubi steps

$$\begin{aligned}\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^2}\,dx &= -\frac{\mathrm{Subst}\left(\int F^{a+bx^2}\,dx, x, \frac{1}{c+dx}\right)}{d}\\ &= -\frac{F^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{2\sqrt{b}\,d\sqrt{\log(F)}}\end{aligned}$$

Mathematica [**A**]
time = 0.01, size = 46, normalized size = 1.00

$$-\frac{F^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right)}{2\sqrt{b}\,d\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^2,x]
```

```
[Out] -1/2*(F^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)])/(Sqrt[b]*d*Sqrt[
Log[F]])
```

Maple [**A**]
time = 0.07, size = 35, normalized size = 0.76

method	result	size
risch	$-\frac{F^a\sqrt{\pi}\,\mathrm{erf}\left(\frac{\sqrt{-b\ln(F)}}{dx+c}\right)}{2d\sqrt{-b\ln(F)}}$	35

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^2)/(d*x+c)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2/d*F^a*Pi^(1/2)/(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1/2)/(d*x+c))
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^2,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^2, x)
```

Fricas [**A**]
time = 0.36, size = 45, normalized size = 0.98

$$\frac{\sqrt{\pi}\,F^a\sqrt{-\frac{b\log(F)}{d^2}}\,\mathrm{erf}\left(\frac{d\sqrt{-\frac{b\log(F)}{d^2}}}{dx+c}\right)}{2\,b\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] 1/2*sqrt(pi)*F^a*sqrt(-b*log(F)/d^2)*erf(d*sqrt(-b*log(F)/d^2)/(d*x + c))/(
b*log(F))
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**2,x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**2)/(c + d*x)**2, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^2,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^2, x)
```

Mupad [B]
time = 3.50, size = 35, normalized size = 0.76

$$-\frac{F^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,\ln(F)}{\sqrt{b\,\ln(F)}\,(c+d\,x)}\right)}{2\,d\,\sqrt{b\,\ln(F)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^2,x)
```

```
[Out] -(F^a*pi^(1/2)*erfi((b*log(F))/((b*log(F))^(1/2)*(c + d*x))))/(2*d*(b*log(F
))^(1/2))
```

3.334 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^4}\,dx$

Optimal. Leaf size=81

$$\frac{F^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{4b^{3/2}d\log^{\frac{3}{2}}(F)}-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)\log(F)}$$

```
[Out] -1/2*F^(a+b/(d*x+c)^2)/b/d/(d*x+c)/ln(F)+1/4*F^a*erfi(b^(1/2)*ln(F)^(1/2)/(
d*x+c))*Pi^(1/2)/b^(3/2)/d/ln(F)^(3/2)
```

Rubi [A]
time = 0.07, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2243, 2242, 2235}

$$\frac{\sqrt{\pi}\,F^a\mathrm{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{4b^{3/2}d\log^{\frac{3}{2}}(F)}-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^4,x]
```

```
[Out] (F^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)])/(4*b^(3/2)*d*Log[F]^(
3/2)) - F^(a + b/(c + d*x)^2)/(2*b*d*(c + d*x)*Log[F])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
```

```
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\begin{aligned}\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^4}\,dx &= -\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)\log(F)}-\frac{\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^2}\,dx}{2b\log(F)}\\ &= -\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)\log(F)}+\frac{\text{Subst}\left(\int F^{a+bx^2}\,dx,x,\frac{1}{c+dx}\right)}{2bd\log(F)}\\ &= \frac{F^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{4b^{3/2}d\log^{\frac{3}{2}}(F)}-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)\log(F)}\end{aligned}$$

Mathematica [A]
time = 0.03, size = 81, normalized size = 1.00

$$\frac{F^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{4b^{3/2}d\log^{\frac{3}{2}}(F)}-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^4,x]
```

```
[Out] (F^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)])/(4*b^(3/2)*d*Log[F]^(
3/2)) - F^(a + b/(c + d*x)^2)/(2*b*d*(c + d*x)*Log[F])
```

Maple [A]
time = 0.07, size = 76, normalized size = 0.94

method	result	size
risch	$-\frac{F^a F^{\frac{b}{(dx+c)^2}}}{2d(dx+c)b\ln(F)}+\frac{F^a\sqrt{\pi}\ \text{erf}\left(\frac{\sqrt{-b\ln(F)}}{dx+c}\right)}{4db\ln(F)\sqrt{-b\ln(F)}}$	76

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^2)/(d*x+c)^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2/d*F^a*F^(b/(d*x+c)^2)/(d*x+c)/b/ln(F)+1/4/d*F^a/b/ln(F)*Pi^(1/2)/(-b*l
n(F))^(1/2)*erf((-b*ln(F))^(1/2)/(d*x+c))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^4,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^4, x)
```

Fricas [A]
time = 0.38, size = 117, normalized size = 1.44

$$-\frac{\sqrt{\pi}\,(d^2x+cd)F^a\sqrt{-\frac{b\log(F)}{d^2}}\,\operatorname{erf}\left(\frac{d\sqrt{-\frac{b\log(F)}{d^2}}}{dx+c}\right)+2\,F^{\frac{ad^2x^2+2\,acdx+ac^2+b}{d^2x^2+2\,cdx+c^2}}b\log(F)}{4\,(b^2d^2x+b^2cd)\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] -1/4*(sqrt(pi)*(d^2*x + c*d)*F^a*sqrt(-b*log(F)/d^2)*erf(d*sqrt(-b*log(F)/d
^2)/(d*x + c)) + 2*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*
x + c^2))*b*log(F))/((b^2*d^2*x + b^2*c*d)*log(F)^2)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**4,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^4,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^4, x)
```

Mupad [B]
time = 3.98, size = 76, normalized size = 0.94

$$\frac{F^a\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b\ln(F)}{\sqrt{b\ln(F)}\,(c+d\,x)}\right)}{4\,b\,d\,\ln(F)\,\sqrt{b\ln(F)}}-\frac{F^a\,F^{\frac{b}{(c+d\,x)^2}}}{2\,b\,d\,\ln(F)\,(c+d\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^4,x)
```

```
[Out] (F^a*pi^(1/2)*erfi((b*log(F))/((b*log(F))^(1/2)*(c + d*x))))/(4*b*d*log(F)*
(b*log(F))^(1/2)) - (F^a*F^(b/(c + d*x)^2))/(2*b*d*log(F)*(c + d*x))
```

3.335 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^6}\,dx$

Optimal. Leaf size=115

$$-\frac{3F^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{8b^{5/2}d\log^{\frac{5}{2}}(F)}+\frac{3F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)\log^2(F)}-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^3\log(F)}$$

```
[Out] 3/4*F^(a+b/(d*x+c)^2)/b^2/d/(d*x+c)/ln(F)^2-1/2*F^(a+b/(d*x+c)^2)/b/d/(d*x+
c)^3/ln(F)-3/8*F^a*erfi(b^(1/2)*ln(F)^(1/2)/(d*x+c))*Pi^(1/2)/b^(5/2)/d/ln(
F)^(5/2)
```

Rubi [A]

time = 0.11, antiderivative size = 115, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {2243, 2242, 2235}

$$-\frac{3\sqrt{\pi}\,F^a\mathrm{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{8b^{5/2}d\log^{\frac{5}{2}}(F)}+\frac{3F^{a+\frac{b}{(c+dx)^2}}}{4b^2d\log^2(F)(c+dx)}-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)(c+dx)^3}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^6,x]
```

```
[Out] (-3*F^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)])/(8*b^(5/2)*d*Log[F
]^(5/2)) + (3*F^(a + b/(c + d*x)^2))/(4*b^2*d*(c + d*x)*Log[F]^2) - F^(a +
b/(c + d*x)^2)/(2*b*d*(c + d*x)^3*Log[F])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
```

```
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^6}\,dx &= -\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^3\log(F)} - \frac{3\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^4}\,dx}{2b\log(F)}\\
&= \frac{3F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^3\log(F)} + \frac{3\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^2}\,dx}{4b^2\log^2(F)}\\
&= \frac{3F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^3\log(F)} - \frac{3\mathrm{Subst}\left(\int F^{a+bx^2}\,dx, x, \frac{1}{c+dx}\right)}{4b^2d\log^2(F)}\\
&= -\frac{3F^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{8b^{5/2}d\log^{\frac{5}{2}}(F)} + \frac{3F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^3\log(F)}
\end{aligned}$$

Mathematica [A]
time = 0.07, size = 95, normalized size = 0.83

$$\frac{F^a\left(-3\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right) - \frac{2\sqrt{b}\,F^{\frac{b}{(c+dx)^2}}\sqrt{\log(F)}\,(-3(c+dx)^2+2b\log(F))}{(c+dx)^3}\right)}{8b^{5/2}d\log^{\frac{5}{2}}(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^6,x]
```

```
[Out] (F^a*(-3*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)] - (2*Sqrt[b]*F^(b/
(c + d*x)^2)*Sqrt[Log[F]]*(-3*(c + d*x)^2 + 2*b*Log[F]))/(c + d*x)^3))/(8*b
^(5/2)*d*Log[F]^(5/2))
```

Maple [A]
time = 0.08, size = 109, normalized size = 0.95

method	result	size

risch	$-\frac{F^a F^{\frac{b}{(dx+c)^2}}}{2d(dx+c)^3 b\ln(F)}+\frac{3F^a F^{\frac{b}{(dx+c)^2}}}{4d\,b^2\ln(F)^2(dx+c)}-\frac{3F^a\sqrt{\pi}\,\operatorname{erf}\left(\frac{\sqrt{-b\ln(F)}}{dx+c}\right)}{8d\,b^2\ln(F)^2\sqrt{-b\ln(F)}}$	109

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^2)/(d*x+c)^6,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*F^a/d*F^(b/(d*x+c)^2)/(d*x+c)^3/b/ln(F)+3/4*F^a/d/b^2/ln(F)^2*F^(b/(d*
x+c)^2)/(d*x+c)-3/8*F^a/d/b^2/ln(F)^2*Pi^(1/2)/(-b*ln(F))^(1/2)*erf((-b*ln(
F))^(1/2)/(d*x+c))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^6,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^6, x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 199 vs. $2(99) = 198$.
time = 0.38, size = 199, normalized size = 1.73

$$\frac{3\sqrt{\pi}\left(d^4x^3+3\,cd^3x^2+3\,c^2d^2x+c^3d\right)F^a\sqrt{-\frac{b\log(F)}{d^2}}\operatorname{erf}\left(\frac{d\sqrt{-\frac{b\log(F)}{d^2}}}{dx+c}\right)-2\left(2\,b^2\log(F)^2-3\left(bd^2x^2+2\,bcdx+bc^2\right)\log(F)\right)F^{\frac{ad^2x^2+2\,acdx+ac^2+b}{d^2x^2+2\,cdx+c^2}}}{8\left(b^3d^4x^3+3\,b^3cd^3x^2+3\,b^3c^2d^2x+b^3c^3d\right)\log(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^6,x, algorithm="fricas")
```

```
[Out] 1/8*(3*sqrt(pi)*(d^4*x^3 + 3*c*d^3*x^2 + 3*c^2*d^2*x + c^3*d)*F^a*sqrt(-b*l
og(F)/d^2)*erf(d*sqrt(-b*log(F)/d^2)/(d*x + c)) - 2*(2*b^2*log(F)^2 - 3*(b*
d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)
/(d^2*x^2 + 2*c*d*x + c^2)))/((b^3*d^4*x^3 + 3*b^3*c*d^3*x^2 + 3*b^3*c^2*d^
2*x + b^3*c^3*d)*log(F)^3)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**6,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^6,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^6, x)
```

Mupad [**B**]
time = 3.90, size = 105, normalized size = 0.91

$$-\frac{F^a\,F^{\frac{b}{{\left(c+d\,x\right)}^2}}}{2\,b\,d\,\ln\left(F\right)\,{\left(c+d\,x\right)}^3}-\frac{F^a\,\left(3\,\sqrt{\pi }\,\mathrm{erfi}\left(\frac{b\,\ln(F)}{\sqrt{b\,\ln\left(F\right)}\,\left(c+d\,x\right)}\right)-\frac{6\,F^{\frac{b}{{\left(c+d\,x\right)}^2}}\,\sqrt{b\,\ln\left(F\right)}}{c+d\,x}\right)}{8\,b^2\,d\,{\ln\left(F\right)}^2\,\sqrt{b\,\ln\left(F\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^6,x)
```

```
[Out] - (F^a*F^(b/(c + d*x)^2))/(2*b*d*log(F)*(c + d*x)^3) - (F^a*(3*pi^(1/2)*erf
i((b*log(F))/((b*log(F))^(1/2)*(c + d*x))) - (6*F^(b/(c + d*x)^2)*(b*log(F)
)^(1/2))/(c + d*x)))/(8*b^2*d*log(F)^2*(b*log(F))^(1/2))
```

3.336 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^8} dx$

Optimal. Leaf size=149

$$\frac{15F^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{16b^{7/2}d\log^{\frac{7}{2}}(F)}-\frac{15F^{a+\frac{b}{(c+dx)^2}}}{8b^3d(c+dx)\log^3(F)}+\frac{5F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)^3\log^2(F)}-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^5\log(F)}$$

```
[Out] -15/8*F^(a+b/(d*x+c)^2)/b^3/d/(d*x+c)/ln(F)^3+5/4*F^(a+b/(d*x+c)^2)/b^2/d/(
d*x+c)^3/ln(F)^2-1/2*F^(a+b/(d*x+c)^2)/b/d/(d*x+c)^5/ln(F)+15/16*F^a*erfi(b
^(1/2)*ln(F)^(1/2)/(d*x+c))*Pi^(1/2)/b^(7/2)/d/ln(F)^(7/2)
```

Rubi [A]

time = 0.14, antiderivative size = 149, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {2243, 2242, 2235}

$$\frac{15\sqrt{\pi}\,F^a\text{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{16b^{7/2}d\log^{\frac{7}{2}}(F)}-\frac{15F^{a+\frac{b}{(c+dx)^2}}}{8b^3d\log^3(F)(c+dx)}+\frac{5F^{a+\frac{b}{(c+dx)^2}}}{4b^2d\log^2(F)(c+dx)^3}-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)(c+dx)^5}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^8,x]
```

```
[Out] (15*F^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)])/(16*b^(7/2)*d*Log[
F]^(7/2)) - (15*F^(a + b/(c + d*x)^2))/(8*b^3*d*(c + d*x)*Log[F]^3) + (5*F^
(a + b/(c + d*x)^2))/(4*b^2*d*(c + d*x)^3*Log[F]^2) - F^(a + b/(c + d*x)^2)
/(2*b*d*(c + d*x)^5*Log[F])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
```

```
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^8}\,dx = -\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^5\log(F)} - \frac{5\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^6}\,dx}{2b\log(F)}$$

$$= \frac{5F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)^3\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^5\log(F)} + \frac{15\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^4}\,dx}{4b^2\log^2(F)}$$

$$= -\frac{15F^{a+\frac{b}{(c+dx)^2}}}{8b^3d(c+dx)\log^3(F)} + \frac{5F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)^3\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^5\log(F)} - \frac{15\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^2}}{8b^3\log^3(F)}$$

$$= -\frac{15F^{a+\frac{b}{(c+dx)^2}}}{8b^3d(c+dx)\log^3(F)} + \frac{5F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)^3\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^5\log(F)} + \frac{15\text{Subst}\left(\int F^{a\cdots}\right.}{8b^3d\,l\cdots}$$

$$= \frac{15F^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right)}{16b^{7/2}d\log^{\frac{7}{2}}(F)} - \frac{15F^{a+\frac{b}{(c+dx)^2}}}{8b^3d(c+dx)\log^3(F)} + \frac{5F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)^3\log^2(F)} - \frac{\cdots}{2bd(c\cdots}$$

Mathematica [A]
time = 0.09, size = 111, normalized size = 0.74

$$\frac{F^a\left(15\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right) - \frac{2\sqrt{b}\,F^{\frac{b}{(c+dx)^2}}\sqrt{\log(F)}\,(15(c+dx)^4-10b(c+dx)^2\log(F)+4b^2\log^2(F))}{(c+dx)^5}\right)}{16b^{7/2}d\log^{\frac{7}{2}}(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^8,x]
```

```
[Out] (F^a*(15*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)] - (2*Sqrt[b]*F^(b/
(c + d*x)^2)*Sqrt[Log[F]]*(15*(c + d*x)^4 - 10*b*(c + d*x)^2*Log[F] + 4*b^2
*Log[F]^2))/(c + d*x)^5))/(16*b^(7/2)*d*Log[F]^(7/2))
```

Maple [A]
time = 0.09, size = 142, normalized size = 0.95

method	result	size

risch	$-\frac{F^a F^{\frac{b}{(dx+c)^2}}}{2d(dx+c)^5 b\ln(F)}+\frac{5F^a F^{\frac{b}{(dx+c)^2}}}{4d\,b^2\ln(F)^2 (dx+c)^3}-\frac{15F^a F^{\frac{b}{(dx+c)^2}}}{8d\,b^3\ln(F)^3 (dx+c)}+\frac{15F^a\sqrt{\pi}\,\operatorname{erf}\left(\frac{\sqrt{-b\ln(F)}}{dx+c}\right)}{16d\,b^3\ln(F)^3\sqrt{-b\ln(F)}}$	142

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^2)/(d*x+c)^8,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*F^a/d*F^(b/(d*x+c)^2)/(d*x+c)^5/b/ln(F)+5/4*F^a/d/b^2/ln(F)^2*F^(b/(d*
x+c)^2)/(d*x+c)^3-15/8*F^a/d/b^3/ln(F)^3*F^(b/(d*x+c)^2)/(d*x+c)+15/16*F^a/
d/b^3/ln(F)^3*Pi^(1/2)/(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1/2)/(d*x+c))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^8,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^8, x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 305 vs. 2(131) = 262.
time = 0.39, size = 305, normalized size = 2.05

$$-\frac{15\sqrt{\pi}\left(d^6x^5+5\,cd^5x^4+10\,c^2d^4x^3+10\,c^3d^3x^2+5\,c^4d^2x+c^5d\right)F^a\sqrt{-\frac{b\log(F)}{d^2}}\operatorname{erf}\left(\frac{d\sqrt{-\frac{b\log(F)}{d^2}}}{dx+c}\right)+2\left(4\,b^3\log(F)^3-10\left(b^2d^2x^2+2\,b^2cdx+b^2c^2\right)\log(F)^2+15\left(bd^4x^4+4\,bcd^3x^3+6\,bc^2d^2x^2+4\,bc^3dx+bc^4\right)\log(F)\right)F^{\frac{ad^2x^2+2\,acdx+ac^2+b}{d^2x^2+2\,cdx+c^2}}}{16\left(b^4d^6x^5+5\,b^4cd^5x^4+10\,b^4c^2d^4x^3+10\,b^4c^3d^3x^2+5\,b^4c^4d^2x+b^4c^5d\right)\log(F)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^8,x, algorithm="fricas")
```

```
[Out] -1/16*(15*sqrt(pi)*(d^6*x^5 + 5*c*d^5*x^4 + 10*c^2*d^4*x^3 + 10*c^3*d^3*x^2
 + 5*c^4*d^2*x + c^5*d)*F^a*sqrt(-b*log(F)/d^2)*erf(d*sqrt(-b*log(F)/d^2)/(
d*x + c)) + 2*(4*b^3*log(F)^3 - 10*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*lo
g(F)^2 + 15*(b*d^4*x^4 + 4*b*c*d^3*x^3 + 6*b*c^2*d^2*x^2 + 4*b*c^3*d*x + b*
c^4)*log(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^
2)))/((b^4*d^6*x^5 + 5*b^4*c*d^5*x^4 + 10*b^4*c^2*d^4*x^3 + 10*b^4*c^3*d^3*
x^2 + 5*b^4*c^4*d^2*x + b^4*c^5*d)*log(F)^4)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**8,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^8,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^8, x)
```

Mupad [B]
time = 4.37, size = 142, normalized size = 0.95

$$\frac{5\,F^a\,F^{\frac{b}{(c+d\,x)^2}}}{4\,b^2\,d\ln\left(F\right)^2\,\left(c+d\,x\right)^3}-\frac{F^a\,F^{\frac{b}{(c+d\,x)^2}}}{2\,b\,d\,\ln\left(F\right)\,\left(c+d\,x\right)^5}-\frac{15\,F^a\,F^{\frac{b}{(c+d\,x)^2}}}{8\,b^3\,d\ln\left(F\right)^3\,\left(c+d\,x\right)}+\frac{15\,F^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,\ln(F)}{\sqrt{b\,\ln\left(F\right)}\,\left(c+d\,x\right)}\right)}{16\,b^3\,d\ln\left(F\right)^3\,\sqrt{b\,\ln\left(F\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^8,x)
```

```
[Out] (5*F^a*F^(b/(c + d*x)^2))/(4*b^2*d*log(F)^2*(c + d*x)^3) - (F^a*F^(b/(c + d
*x)^2))/(2*b*d*log(F)*(c + d*x)^5) - (15*F^a*F^(b/(c + d*x)^2))/(8*b^3*d*lo
g(F)^3*(c + d*x)) + (15*F^a*pi^(1/2)*erfi((b*log(F))/((b*log(F))^(1/2)*(c +
 d*x))))/(16*b^3*d*log(F)^3*(b*log(F))^(1/2))
```

3.337 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^{10}}\,dx$

Optimal. Leaf size=183

$$-\frac{105F^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{32b^{9/2}d\log^{\frac{9}{2}}(F)}+\frac{105F^{a+\frac{b}{(c+dx)^2}}}{16b^4d(c+dx)\log^4(F)}-\frac{35F^{a+\frac{b}{(c+dx)^2}}}{8b^3d(c+dx)^3\log^3(F)}+\frac{7F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)^5\log^2(F)}-$$

```
[Out] 105/16*F^(a+b/(d*x+c)^2)/b^4/d/(d*x+c)/ln(F)^4-35/8*F^(a+b/(d*x+c)^2)/b^3/d
/(d*x+c)^3/ln(F)^3+7/4*F^(a+b/(d*x+c)^2)/b^2/d/(d*x+c)^5/ln(F)^2-1/2*F^(a+b
/(d*x+c)^2)/b/d/(d*x+c)^7/ln(F)-105/32*F^a*erfi(b^(1/2)*ln(F)^(1/2)/(d*x+c)
)*Pi^(1/2)/b^(9/2)/d/ln(F)^(9/2)
```

Rubi [A]
time = 0.18, antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {2243, 2242, 2235}

$$-\frac{105\sqrt{\pi}\,F^a\mathrm{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{32b^{9/2}d\log^{\frac{9}{2}}(F)}+\frac{105F^{a+\frac{b}{(c+dx)^2}}}{16b^4d\log^4(F)(c+dx)}-\frac{35F^{a+\frac{b}{(c+dx)^2}}}{8b^3d\log^3(F)(c+dx)^3}+\frac{7F^{a+\frac{b}{(c+dx)^2}}}{4b^2d\log^2(F)(c+dx)^5}-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)(c+dx)^7}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^10,x]
```

```
[Out] (-105*F^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)])/(32*b^(9/2)*d*Lo
g[F]^(9/2)) + (105*F^(a + b/(c + d*x)^2))/(16*b^4*d*(c + d*x)*Log[F]^4) - (
35*F^(a + b/(c + d*x)^2))/(8*b^3*d*(c + d*x)^3*Log[F]^3) + (7*F^(a + b/(c +
 d*x)^2))/(4*b^2*d*(c + d*x)^5*Log[F]^2) - F^(a + b/(c + d*x)^2)/(2*b*d*(c
+ d*x)^7*Log[F])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^{10}}\,dx = -\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^7\log(F)} - \frac{7\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^8}\,dx}{2b\log(F)}$$

$$= \frac{7F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)^5\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^7\log(F)} + \frac{35\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^6}\,dx}{4b^2\log^2(F)}$$

$$= -\frac{35F^{a+\frac{b}{(c+dx)^2}}}{8b^3d(c+dx)^3\log^3(F)} + \frac{7F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)^5\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^7\log(F)} - \frac{105\int \frac{F^{a+\frac{b}{(c+dx}}}{(c+dx)^4}}{8b^3\log^3(F}$$

$$= \frac{105F^{a+\frac{b}{(c+dx)^2}}}{16b^4d(c+dx)\log^4(F)} - \frac{35F^{a+\frac{b}{(c+dx)^2}}}{8b^3d(c+dx)^3\log^3(F)} + \frac{7F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)^5\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx}}}{2bd(c+dx)^7}$$

$$= \frac{105F^{a+\frac{b}{(c+dx)^2}}}{16b^4d(c+dx)\log^4(F)} - \frac{35F^{a+\frac{b}{(c+dx)^2}}}{8b^3d(c+dx)^3\log^3(F)} + \frac{7F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)^5\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx}}}{2bd(c+dx)^7}$$

$$= -\frac{105F^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right)}{32b^{9/2}d\log^{\frac{9}{2}}(F)} + \frac{105F^{a+\frac{b}{(c+dx)^2}}}{16b^4d(c+dx)\log^4(F)} - \frac{35F^{a+\frac{b}{(c+dx)^2}}}{8b^3d(c+dx)^3\log^3(F)} + \frac{}{4}$$

Mathematica [A]
time = 0.11, size = 127, normalized size = 0.69

$$\frac{F^a\left(-105\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right) + \frac{2\sqrt{b}\,F^{\frac{b}{(c+dx)^2}}\sqrt{\log(F)}\,(105(c+dx)^6-70b(c+dx)^4\log(F)+28b^2(c+dx)^2\log^2(F)-8b^3\log^3(F))}{(c+dx)^7}\right)}{32b^{9/2}d\log^{\frac{9}{2}}(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^10,x]
```

```
[Out] (F^a*(-105*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)] + (2*Sqrt[b]*F^(
b/(c + d*x)^2)*Sqrt[Log[F]]*(105*(c + d*x)^6 - 70*b*(c + d*x)^4*Log[F] + 28
*b^2*(c + d*x)^2*Log[F]^2 - 8*b^3*Log[F]^3))/(c + d*x)^7))/(32*b^(9/2)*d*Lo
g[F]^(9/2))
```

Maple [A]
time = 0.12, size = 175, normalized size = 0.96

method	result
risch	$-\frac{F^{a} F^{\frac{b}{(dx+c)^{2}}}}{2d(dx+c)^{7} b \ln(F)}+\frac{7F^{a} F^{\frac{b}{(dx+c)^{2}}}}{4d\, b^{2} \ln(F)^{2} (dx+c)^{5}}-\frac{35F^{a} F^{\frac{b}{(dx+c)^{2}}}}{8d\, b^{3} \ln(F)^{3} (dx+c)^{3}}+\frac{105F^{a} F^{\frac{b}{(dx+c)^{2}}}}{16d\, b^{4} \ln(F)^{4} (dx+c)}-\frac{105F^{a} \sqrt{\pi}\ \mathrm{erf}\left(\frac{\sqrt{-b \ln (}}{dx+c}\right.}{32d\, b^{4} \ln(F)^{4} \sqrt{-b \ln (F}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^2)/(d*x+c)^10,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*F^a/d*F^(b/(d*x+c)^2)/(d*x+c)^7/b/ln(F)+7/4*F^a/d/b^2/ln(F)^2*F^(b/(d*
x+c)^2)/(d*x+c)^5-35/8*F^a/d/b^3/ln(F)^3*F^(b/(d*x+c)^2)/(d*x+c)^3+105/16*F
^a/d/b^4/ln(F)^4*F^(b/(d*x+c)^2)/(d*x+c)-105/32*F^a/d/b^4/ln(F)^4*Pi^(1/2)/
(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1/2)/(d*x+c))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^10,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^10, x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 439 vs. $2(163) = 326$.
time = 0.40, size = 439, normalized size = 2.40

$$\frac{105 \sqrt{\pi} \left(d^{8} x^{7} + 7 \, c d^{7} x^{6} + 21 \, c^{2} d^{6} x^{5} + 35 \, c^{3} d^{5} x^{4} + 35 \, c^{4} d^{4} x^{3} + 21 \, c^{5} d^{3} x^{2} + 7 \, c^{6} d^{2} x + c^{7} d\right) F^{a} \sqrt{-\frac{b \log\left(F\right)}{d^{2}}} \operatorname{erf}\left(\frac{d \sqrt{-\frac{b \log\left(F\right)}{d^{2}}}}{d x + c}\right) - 2 \, {\left(8 \, b^{4} \log\left(F\right)^{4} - 28 \, {\left(b^{3} d^{2} x^{2} + 2 \, b^{3} c d x + b^{3} c^{2}\right)} \log\left(F\right)^{3} + 70 \, {\left(b^{2} d^{4} x^{4} + 4 \, b^{2} c d^{3} x^{3} + 6 \, b^{2} c^{2} d^{2} x^{2} + 4 \, b^{2} c^{3} d x + b^{2} c^{4}\right)} \log\left(F\right)^{2} - 105 \, {\left(b d^{6} x^{6} + 6 \, b c d^{5} x^{5} + 15 \, b c^{2} d^{4} x^{4} + 20 \, b c^{3} d^{3} x^{3} + 15 \, b c^{4} d^{2} x^{2} + 6 \, b c^{5} d x + b c^{6}\right)} \log\left(F\right)\right)} F^{\frac{a d^{2} x^{2} + 2 \, a c d x + a c^{2} + b}{d^{2} x^{2} + 2 \, c d x + c^{2}}}}{32 \, {\left(b^{5} d^{8} x^{7} + 7 \, b^{5} c d^{7} x^{6} + 21 \, b^{5} c^{2} d^{6} x^{5} + 35 \, b^{5} c^{3} d^{5} x^{4} + 35 \, b^{5} c^{4} d^{4} x^{3} + 21 \, b^{5} c^{5} d^{3} x^{2} + 7 \, b^{5} c^{6} d^{2} x + b^{5} c^{7} d\right)} \log\left(F\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^10,x, algorithm="fricas")
```

```
[Out] 1/32*(105*sqrt(pi)*(d^8*x^7 + 7*c*d^7*x^6 + 21*c^2*d^6*x^5 + 35*c^3*d^5*x^4
 + 35*c^4*d^4*x^3 + 21*c^5*d^3*x^2 + 7*c^6*d^2*x + c^7*d)*F^a*sqrt(-b*log(F
)/d^2)*erf(d*sqrt(-b*log(F)/d^2)/(d*x + c)) - 2*(8*b^4*log(F)^4 - 28*(b^3*d
^2*x^2 + 2*b^3*c*d*x + b^3*c^2)*log(F)^3 + 70*(b^2*d^4*x^4 + 4*b^2*c*d^3*x^
3 + 6*b^2*c^2*d^2*x^2 + 4*b^2*c^3*d*x + b^2*c^4)*log(F)^2 - 105*(b*d^6*x^6
+ 6*b*c*d^5*x^5 + 15*b*c^2*d^4*x^4 + 20*b*c^3*d^3*x^3 + 15*b*c^4*d^2*x^2 +
6*b*c^5*d*x + b*c^6)*log(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^
2 + 2*c*d*x + c^2)))/((b^5*d^8*x^7 + 7*b^5*c*d^7*x^6 + 21*b^5*c^2*d^6*x^5 +
 35*b^5*c^3*d^5*x^4 + 35*b^5*c^4*d^4*x^3 + 21*b^5*c^5*d^3*x^2 + 7*b^5*c^6*d
^2*x + b^5*c^7*d)*log(F)^5)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**10,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^10,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^10, x)
```

Mupad [B]
time = 4.62, size = 160, normalized size = 0.87

$$-\frac{\frac{F^a\left(105\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\ln(F)}{\sqrt{b\ln(F)}\,(c+d\,x)}\right)-\frac{210\,F^{\frac{b}{(c+d\,x)^2}}\sqrt{b\ln(F)}}{c+d\,x}\right)}{32\sqrt{b\ln(F)}}-\frac{7\,F^a\,F^{\frac{b}{(c+d\,x)^2}}\,b^2\ln(F)^2}{4\,(c+d\,x)^5}+\frac{F^a\,F^{\frac{b}{(c+d\,x)^2}}\,b^3\ln(F)^3}{2\,(c+d\,x)^7}+\frac{35\,F^a\,F^{\frac{b}{(c+d\,x)^2}}\,b\ln(F)}{8\,(c+d\,x)^3}}{b^4\,d\ln(F)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^10,x)
```

```
[Out] -((F^a*(105*pi^(1/2)*erfi((b*log(F))/((b*log(F))^(1/2)*(c + d*x))) - (210*F
^(b/(c + d*x)^2)*(b*log(F))^(1/2))/(c + d*x)))/(32*(b*log(F))^(1/2)) - (7*F
^a*F^(b/(c + d*x)^2)*b^2*log(F)^2)/(4*(c + d*x)^5) + (F^a*F^(b/(c + d*x)^2)
*b^3*log(F)^3)/(2*(c + d*x)^7) + (35*F^a*F^(b/(c + d*x)^2)*b*log(F))/(8*(c
+ d*x)^3))/(b^4*d*log(F)^4)
```

3.338 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^{12}}\,dx$

Optimal. Leaf size=49

$$\frac{F^a\Gamma\left(\frac{11}{2},-\frac{b\log(F)}{(c+dx)^2}\right)}{2d(c+dx)^{11}\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{11/2}}$$

```
[Out] 1/2*F^a*(1048576/6183686925497065825762484 0625*GAMMA(51/2,-b*ln(F)/(d*x+c)^
2)-1048576/61836869254970658257624840625*(-b*ln(F)/(d*x+c)^2)^(49/2)*exp(b*
ln(F)/(d*x+c)^2)-524288/1261976923570829760359690625*(-b*ln(F)/(d*x+c)^2)^(
47/2)*exp(b*ln(F)/(d*x+c)^2)-262144/26850572841932548092759375*(-b*ln(F)/(d
*x+c)^2)^(45/2)*exp(b*ln(F)/(d*x+c)^2)-131072/596679396487389957616875*(-b*
ln(F)/(d*x+c)^2)^(43/2)*exp(b*ln(F)/(d*x+c)^2)-65536/1387626503459046413062
5*(-b*ln(F)/(d*x+c)^2)^(41/2)*exp(b*ln(F)/(d*x+c)^2)-32768/3384454886485479
05625*(-b*ln(F)/(d*x+c)^2)^(39/2)*exp(b*ln(F)/(d*x+c)^2)-16384/867808945252
6869375*(-b*ln(F)/(d*x+c)^2)^(37/2)*exp(b*ln(F)/(d*x+c)^2)-8192/23454295817
6401875*(-b*ln(F)/(d*x+c)^2)^(35/2)*exp(b*ln(F)/(d*x+c)^2)-4096/67012273764
68625*(-b*ln(F)/(d*x+c)^2)^(33/2)*exp(b*ln(F)/(d*x+c)^2)-2048/2030674962566
25*(-b*ln(F)/(d*x+c)^2)^(31/2)*exp(b*ln(F)/(d*x+c)^2)-1024/6550564395375*(-
b*ln(F)/(d*x+c)^2)^(29/2)*exp(b*ln(F)/(d*x+c)^2)-512/225881530875*(-b*ln(F)
/(d*x+c)^2)^(27/2)*exp(b*ln(F)/(d*x+c)^2)-256/8365982625*(-b*ln(F)/(d*x+c)^
2)^(25/2)*exp(b*ln(F)/(d*x+c)^2)-128/334639305*(-b*ln(F)/(d*x+c)^2)^(23/2)*
exp(b*ln(F)/(d*x+c)^2)-64/14549535*(-b*ln(F)/(d*x+c)^2)^(21/2)*exp(b*ln(F)/
(d*x+c)^2)-32/692835*(-b*ln(F)/(d*x+c)^2)^(19/2)*exp(b*ln(F)/(d*x+c)^2)-16/
36465*(-b*ln(F)/(d*x+c)^2)^(17/2)*exp(b*ln(F)/(d*x+c)^2)-8/2145*(-b*ln(F)/(
d*x+c)^2)^(15/2)*exp(b*ln(F)/(d*x+c)^2)-4/143*(-b*ln(F)/(d*x+c)^2)^(13/2)*e
xp(b*ln(F)/(d*x+c)^2)-2/11*(-b*ln(F)/(d*x+c)^2)^(11/2)*exp(b*ln(F)/(d*x+c)^
2))/d/(d*x+c)^11/(-b*ln(F)/(d*x+c)^2)^(11/2)
```

Rubi [A]
time = 0.03, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$\frac{F^a\text{Gamma}\left(\frac{11}{2},-\frac{b\log(F)}{(c+dx)^2}\right)}{2d(c+dx)^{11}\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{11/2}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^12,x]
```

```
[Out] (F^a*Gamma[11/2, -((b*Log[F])/(c + d*x)^2)])/(2*d*(c + d*x)^11*(-((b*Log[F]
)/(c + d*x)^2))^(11/2))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^{12}}\,dx = \frac{F^a\Gamma\left(\frac{11}{2},-\frac{b\log(F)}{(c+dx)^2}\right)}{2d(c+dx)^{11}\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{11/2}}$$

Mathematica [A]
time = 0.03, size = 49, normalized size = 1.00

$$\frac{F^a\Gamma\left(\frac{11}{2},-\frac{b\log(F)}{(c+dx)^2}\right)}{2d(c+dx)^{11}\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{11/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^12,x]
```

```
[Out] (F^a*Gamma[11/2, -((b*Log[F])/(c + d*x)^2)])/(2*d*(c + d*x)^11*(-((b*Log[F]
)/(c + d*x)^2))^(11/2))
```

Maple [A]
time = 0.18, size = 208, normalized size = 4.24

method	result
risch	$-\frac{F^a F^{\frac{b}{(dx+c)^2}}}{2d(dx+c)^9 b\ln(F)}+\frac{9F^a F^{\frac{b}{(dx+c)^2}}}{4d\,b^2\ln(F)^2(dx+c)^7}-\frac{63F^a F^{\frac{b}{(dx+c)^2}}}{8d\,b^3\ln(F)^3(dx+c)^5}+\frac{315F^a F^{\frac{b}{(dx+c)^2}}}{16d\,b^4\ln(F)^4(dx+c)^3}-\frac{945F^a F^{\frac{b}{(dx+c)^2}}}{32d\,b^5\ln(F)^5(dx+c)}+\frac{945F^a}{64c}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^2)/(d*x+c)^12,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*F^a/d*F^(b/(d*x+c)^2)/(d*x+c)^9/b/ln(F)+9/4*F^a/d/b^2/ln(F)^2*F^(b/(d*
x+c)^2)/(d*x+c)^7-63/8*F^a/d/b^3/ln(F)^3*F^(b/(d*x+c)^2)/(d*x+c)^5+315/16*F
^a/d/b^4/ln(F)^4*F^(b/(d*x+c)^2)/(d*x+c)^3-945/32*F^a/d/b^5/ln(F)^5*F^(b/(d
*x+c)^2)/(d*x+c)+945/64*F^a/d/b^5/ln(F)^5*Pi^(1/2)/(-b*ln(F))^(1/2)*erf((-b
*ln(F))^(1/2)/(d*x+c))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^12,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^12, x)
```

Fricas [A]
time = 0.12, size = 601, normalized size = 12.27

$$-\frac{945\sqrt{\pi}\left(d^{10}x^9+9cd^9x^8+36c^2d^8x^7+84c^3d^7x^6+126c^4d^6x^5+126c^5d^5x^4+84c^6d^4x^3+36c^7d^3x^2+9c^8d^2x+c^9d\right)F^a\sqrt{-\frac{b\log\left(F\right)}{d^2}}\operatorname{erf}\left(\frac{d\sqrt{-\frac{b\log\left(F\right)}{d^2}}}{dx+c}\right)+2\left(16b^5\log\left(F\right)^5-72\left(b^4d^2x^2+2b^4cdx+b^4c^2\right)\log\left(F\right)^4+252\left(b^3d^4x^4+4b^3cd^3x^3+6b^3c^2d^2x^2+4b^3c^3dx+b^3c^4\right)\log\left(F\right)^3-630\left(b^2d^6x^6+6b^2cd^5x^5+15b^2c^2d^4x^4+20b^2c^3d^3x^3+15b^2c^4d^2x^2+6b^2c^5dx+b^2c^6\right)\log\left(F\right)^2+945\left(bd^8x^8+8bcd^7x^7+28bc^2d^6x^6+56bc^3d^5x^5+70bc^4d^4x^4+56bc^5d^3x^3+28bc^6d^2x^2+8bc^7dx+bc^8\right)\log\left(F\right)\right)F^{\frac{ad^2x^2+2acdx+ac^2+b}{d^2x^2+2cdx+c^2}}}{64\left(b^6d^{10}x^9+9b^6cd^9x^8+36b^6c^2d^8x^7+84b^6c^3d^7x^6+126b^6c^4d^6x^5+126b^6c^5d^5x^4+84b^6c^6d^4x^3+36b^6c^7d^3x^2+9b^6c^8d^2x+b^6c^9d\right)\log\left(F\right)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^12,x, algorithm="fricas")
```

```
[Out] -1/64*(945*sqrt(pi)*(d^10*x^9 + 9*c*d^9*x^8 + 36*c^2*d^8*x^7 + 84*c^3*d^7*x
^6 + 126*c^4*d^6*x^5 + 126*c^5*d^5*x^4 + 84*c^6*d^4*x^3 + 36*c^7*d^3*x^2 +
9*c^8*d^2*x + c^9*d)*F^a*sqrt(-b*log(F)/d^2)*erf(d*sqrt(-b*log(F)/d^2)/(d*x
 + c)) + 2*(16*b^5*log(F)^5 - 72*(b^4*d^2*x^2 + 2*b^4*c*d*x + b^4*c^2)*log(
F)^4 + 252*(b^3*d^4*x^4 + 4*b^3*c*d^3*x^3 + 6*b^3*c^2*d^2*x^2 + 4*b^3*c^3*d
*x + b^3*c^4)*log(F)^3 - 630*(b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^
4*x^4 + 20*b^2*c^3*d^3*x^3 + 15*b^2*c^4*d^2*x^2 + 6*b^2*c^5*d*x + b^2*c^6)*
log(F)^2 + 945*(b*d^8*x^8 + 8*b*c*d^7*x^7 + 28*b*c^2*d^6*x^6 + 56*b*c^3*d^5
*x^5 + 70*b*c^4*d^4*x^4 + 56*b*c^5*d^3*x^3 + 28*b*c^6*d^2*x^2 + 8*b*c^7*d*x
 + b*c^8)*log(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x
 + c^2)))/((b^6*d^10*x^9 + 9*b^6*c*d^9*x^8 + 36*b^6*c^2*d^8*x^7 + 84*b^6*c^
3*d^7*x^6 + 126*b^6*c^4*d^6*x^5 + 126*b^6*c^5*d^5*x^4 + 84*b^6*c^6*d^4*x^3
+ 36*b^6*c^7*d^3*x^2 + 9*b^6*c^8*d^2*x + b^6*c^9*d)*log(F)^6)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**12,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^12,x, algorithm="giac")
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^12, x)
```

Mupad [B]
time = 4.92, size = 189, normalized size = 3.86

$$\frac{\frac{F^a\left(945\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\ln(F)}{\sqrt{b\ln(F)}\,(c+dx)}\right)-\frac{1890\,F^{\frac{b}{(c+dx)^2}}\sqrt{b\ln(F)}}{c+dx}\right)}{64\sqrt{b\ln(F)}}-\frac{63\,F^a\,F^{\frac{b}{(c+dx)^2}}\,b^2\ln(F)^2}{8\,(c+dx)^5}+\frac{9\,F^a\,F^{\frac{b}{(c+dx)^2}}\,b^3\ln(F)^3}{4\,(c+dx)^7}-\frac{F^a\,F^{\frac{b}{(c+dx)^2}}\,b^4\ln(F)^4}{2\,(c+dx)^9}+\frac{315\,F^a\,F^{\frac{b}{(c+dx)^2}}\,b\ln(F)}{16\,(c+dx)^3}}{b^5\,d\ln(F)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^12,x)
[Out] ((F^a*(945*pi^(1/2)*erfi((b*log(F))/((b*log(F))^(1/2)*(c + d*x))) - (1890*F
^(b/(c + d*x)^2)*(b*log(F))^(1/2))/(c + d*x)))/(64*(b*log(F))^(1/2)) - (63*
F^a*F^(b/(c + d*x)^2)*b^2*log(F)^2)/(8*(c + d*x)^5) + (9*F^a*F^(b/(c + d*x)
^2)*b^3*log(F)^3)/(4*(c + d*x)^7) - (F^a*F^(b/(c + d*x)^2)*b^4*log(F)^4)/(2
*(c + d*x)^9) + (315*F^a*F^(b/(c + d*x)^2)*b*log(F))/(16*(c + d*x)^3))/(b^5
*d*log(F)^5)
```

3.339 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^{14}} dx$

Optimal. Leaf size=49

$$\frac{F^a\Gamma\left(\frac{13}{2},-\frac{b\log(F)}{(c+dx)^2}\right)}{2d(c+dx)^{13}\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{13/2}}$$

```
[Out] 1/2*F^a*(524288/5621533568633696205238621875*GAMMA(51/2,-b*ln(F)/(d*x+c)^2)
-524288/5621533568633696205238621875*(-b*ln(F)/(d*x+c)^2)^(49/2)*exp(b*ln(F
)/(d*x+c)^2)-262144/114725174870075432759971875*(-b*ln(F)/(d*x+c)^2)^(47/2)
*exp(b*ln(F)/(d*x+c)^2)-131072/2440961167448413462978125*(-b*ln(F)/(d*x+c)^
2)^(45/2)*exp(b*ln(F)/(d*x+c)^2)-65536/54243581498853632510625*(-b*ln(F)/(d
*x+c)^2)^(43/2)*exp(b*ln(F)/(d*x+c)^2)-32768/1261478639508224011875*(-b*ln(
F)/(d*x+c)^2)^(41/2)*exp(b*ln(F)/(d*x+c)^2)-16384/30767771695322536875*(-b*
ln(F)/(d*x+c)^2)^(39/2)*exp(b*ln(F)/(d*x+c)^2)-8192/788917222956988125*(-b*
ln(F)/(d*x+c)^2)^(37/2)*exp(b*ln(F)/(d*x+c)^2)-4096/21322087106945625*(-b*l
n(F)/(d*x+c)^2)^(35/2)*exp(b*ln(F)/(d*x+c)^2)-2048/609202488769875*(-b*ln(F
)/(d*x+c)^2)^(33/2)*exp(b*ln(F)/(d*x+c)^2)-1024/18460681477875*(-b*ln(F)/(d
*x+c)^2)^(31/2)*exp(b*ln(F)/(d*x+c)^2)-512/595505854125*(-b*ln(F)/(d*x+c)^2
)^(29/2)*exp(b*ln(F)/(d*x+c)^2)-256/20534684625*(-b*ln(F)/(d*x+c)^2)^(27/2)
*exp(b*ln(F)/(d*x+c)^2)-128/760543875*(-b*ln(F)/(d*x+c)^2)^(25/2)*exp(b*ln(
F)/(d*x+c)^2)-64/30421755*(-b*ln(F)/(d*x+c)^2)^(23/2)*exp(b*ln(F)/(d*x+c)^2
)-32/1322685*(-b*ln(F)/(d*x+c)^2)^(21/2)*exp(b*ln(F)/(d*x+c)^2)-16/62985*(-
b*ln(F)/(d*x+c)^2)^(19/2)*exp(b*ln(F)/(d*x+c)^2)-8/3315*(-b*ln(F)/(d*x+c)^2
)^(17/2)*exp(b*ln(F)/(d*x+c)^2)-4/195*(-b*ln(F)/(d*x+c)^2)^(15/2)*exp(b*ln(
F)/(d*x+c)^2)-2/13*(-b*ln(F)/(d*x+c)^2)^(13/2)*exp(b*ln(F)/(d*x+c)^2))/d/(d
*x+c)^13/(-b*ln(F)/(d*x+c)^2)^(13/2)
```

Rubi [A]
time = 0.03, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$\frac{F^a\text{Gamma}\left(\frac{13}{2},-\frac{b\log(F)}{(c+dx)^2}\right)}{2d(c+dx)^{13}\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{13/2}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^14,x]
```

```
[Out] (F^a*Gamma[13/2, -((b*Log[F])/(c + d*x)^2)])/(2*d*(c + d*x)^13*(-((b*Log[F]
)/(c + d*x)^2))^(13/2))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^{14}}\,dx = \frac{F^a\Gamma\left(\frac{13}{2},-\frac{b\log(F)}{(c+dx)^2}\right)}{2d(c+dx)^{13}\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{13/2}}$$

Mathematica [A]
time = 0.02, size = 49, normalized size = 1.00

$$\frac{F^a\Gamma\left(\frac{13}{2},-\frac{b\log(F)}{(c+dx)^2}\right)}{2d(c+dx)^{13}\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{13/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^14,x]
```

```
[Out] (F^a*Gamma[13/2, -((b*Log[F])/(c + d*x)^2)])/(2*d*(c + d*x)^13*(-((b*Log[F]
)/(c + d*x)^2))^(13/2))
```

Maple [A]
time = 0.21, size = 241, normalized size = 4.92

method	result
risch	$-\frac{F^a F^{\frac{b}{(dx+c)^2}}}{2d(dx+c)^{11} b\ln(F)}+\frac{11F^a F^{\frac{b}{(dx+c)^2}}}{4d\,b^2\ln(F)^2(dx+c)^9}-\frac{99F^a F^{\frac{b}{(dx+c)^2}}}{8d\,b^3\ln(F)^3(dx+c)^7}+\frac{693F^a F^{\frac{b}{(dx+c)^2}}}{16d\,b^4\ln(F)^4(dx+c)^5}-\frac{3465F^a F^{\frac{b}{(dx+c)^2}}}{32d\,b^5\ln(F)^5(dx+c)^3}+\frac{1039}{64d\,b}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^2)/(d*x+c)^14,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*F^a/d*F^(b/(d*x+c)^2)/(d*x+c)^11/b/ln(F)+11/4*F^a/d/b^2/ln(F)^2*F^(b/(
d*x+c)^2)/(d*x+c)^9-99/8*F^a/d/b^3/ln(F)^3*F^(b/(d*x+c)^2)/(d*x+c)^7+693/16
*F^a/d/b^4/ln(F)^4*F^(b/(d*x+c)^2)/(d*x+c)^5-3465/32*F^a/d/b^5/ln(F)^5*F^(b
/(d*x+c)^2)/(d*x+c)^3+10395/64*F^a/d/b^6/ln(F)^6*F^(b/(d*x+c)^2)/(d*x+c)-10
395/128*F^a/d/b^6/ln(F)^6*Pi^(1/2)/(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1/2)/(d
*x+c))
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^14,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^14, x)
```

Fricas [**A**]
time = 0.14, size = 791, normalized size = 16.14

$$\frac{10395\,\sqrt{\pi}\left(d^{12}x^{11}+11\,cd^{11}x^{10}+55\,c^{2}d^{10}x^{9}+165\,c^{3}d^{9}x^{8}+330\,c^{4}d^{8}x^{7}+462\,c^{5}d^{7}x^{6}+462\,c^{6}d^{6}x^{5}+330\,c^{7}d^{5}x^{4}+165\,c^{8}d^{4}x^{3}+55\,c^{9}d^{3}x^{2}+11\,c^{10}d^{2}x+c^{11}d\right)F^{a}\sqrt{-\frac{b\log\left(F\right)}{d^{2}}}\operatorname{erf}\left(\frac{d\sqrt{-\frac{b\log\left(F\right)}{d^{2}}}}{dx+c}\right)-2\left(32\,b^{6}\log\left(F\right)^{6}-176\left(b^{5}d^{2}x^{2}+2\,b^{5}cdx+b^{5}c^{2}\right)\log\left(F\right)^{5}+792\left(b^{4}d^{4}x^{4}+4\,b^{4}cd^{3}x^{3}+6\,b^{4}c^{2}d^{2}x^{2}+4\,b^{4}c^{3}dx+b^{4}c^{4}\right)\log\left(F\right)^{4}-2772\left(b^{3}d^{6}x^{6}+6\,b^{3}cd^{5}x^{5}+15\,b^{3}c^{2}d^{4}x^{4}+20\,b^{3}c^{3}d^{3}x^{3}+15\,b^{3}c^{4}d^{2}x^{2}+6\,b^{3}c^{5}dx+b^{3}c^{6}\right)\log\left(F\right)^{3}+6930\left(b^{2}d^{8}x^{8}+8\,b^{2}cd^{7}x^{7}+28\,b^{2}c^{2}d^{6}x^{6}+56\,b^{2}c^{3}d^{5}x^{5}+70\,b^{2}c^{4}d^{4}x^{4}+56\,b^{2}c^{5}d^{3}x^{3}+28\,b^{2}c^{6}d^{2}x^{2}+8\,b^{2}c^{7}dx+b^{2}c^{8}\right)\log\left(F\right)^{2}-10395\left(bd^{10}x^{10}+10\,bcd^{9}x^{9}+45\,bc^{2}d^{8}x^{8}+120\,bc^{3}d^{7}x^{7}+210\,bc^{4}d^{6}x^{6}+252\,bc^{5}d^{5}x^{5}+210\,bc^{6}d^{4}x^{4}+120\,bc^{7}d^{3}x^{3}+45\,bc^{8}d^{2}x^{2}+10\,bc^{9}dx+bc^{10}\right)\log\left(F\right)\right)F^{\frac{ad^{2}x^{2}+2\,acdx+ac^{2}+b}{d^{2}x^{2}+2\,cdx+c^{2}}}}{128\left(b^{7}d^{12}x^{11}+11\,b^{7}cd^{11}x^{10}+55\,b^{7}c^{2}d^{10}x^{9}+165\,b^{7}c^{3}d^{9}x^{8}+330\,b^{7}c^{4}d^{8}x^{7}+462\,b^{7}c^{5}d^{7}x^{6}+462\,b^{7}c^{6}d^{6}x^{5}+330\,b^{7}c^{7}d^{5}x^{4}+165\,b^{7}c^{8}d^{4}x^{3}+55\,b^{7}c^{9}d^{3}x^{2}+11\,b^{7}c^{10}d^{2}x+b^{7}c^{11}d\right)\log\left(F\right)^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^14,x, algorithm="fricas")
```

```
[Out] 1/128*(10395*sqrt(pi)*(d^12*x^11 + 11*c*d^11*x^10 + 55*c^2*d^10*x^9 + 165*c
^3*d^9*x^8 + 330*c^4*d^8*x^7 + 462*c^5*d^7*x^6 + 462*c^6*d^6*x^5 + 330*c^7*
d^5*x^4 + 165*c^8*d^4*x^3 + 55*c^9*d^3*x^2 + 11*c^10*d^2*x + c^11*d)*F^a*sq
rt(-b*log(F)/d^2)*erf(d*sqrt(-b*log(F)/d^2)/(d*x + c)) - 2*(32*b^6*log(F)^6
 - 176*(b^5*d^2*x^2 + 2*b^5*c*d*x + b^5*c^2)*log(F)^5 + 792*(b^4*d^4*x^4 +
4*b^4*c*d^3*x^3 + 6*b^4*c^2*d^2*x^2 + 4*b^4*c^3*d*x + b^4*c^4)*log(F)^4 - 2
772*(b^3*d^6*x^6 + 6*b^3*c*d^5*x^5 + 15*b^3*c^2*d^4*x^4 + 20*b^3*c^3*d^3*x^
3 + 15*b^3*c^4*d^2*x^2 + 6*b^3*c^5*d*x + b^3*c^6)*log(F)^3 + 6930*(b^2*d^8*
x^8 + 8*b^2*c*d^7*x^7 + 28*b^2*c^2*d^6*x^6 + 56*b^2*c^3*d^5*x^5 + 70*b^2*c^
4*d^4*x^4 + 56*b^2*c^5*d^3*x^3 + 28*b^2*c^6*d^2*x^2 + 8*b^2*c^7*d*x + b^2*c
^8)*log(F)^2 - 10395*(b*d^10*x^10 + 10*b*c*d^9*x^9 + 45*b*c^2*d^8*x^8 + 120
*b*c^3*d^7*x^7 + 210*b*c^4*d^6*x^6 + 252*b*c^5*d^5*x^5 + 210*b*c^6*d^4*x^4
+ 120*b*c^7*d^3*x^3 + 45*b*c^8*d^2*x^2 + 10*b*c^9*d*x + b*c^10)*log(F))*F^(
(a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2)))/((b^7*d^12*
x^11 + 11*b^7*c*d^11*x^10 + 55*b^7*c^2*d^10*x^9 + 165*b^7*c^3*d^9*x^8 + 330
*b^7*c^4*d^8*x^7 + 462*b^7*c^5*d^7*x^6 + 462*b^7*c^6*d^6*x^5 + 330*b^7*c^7*
d^5*x^4 + 165*b^7*c^8*d^4*x^3 + 55*b^7*c^9*d^3*x^2 + 11*b^7*c^10*d^2*x + b^
7*c^11*d)*log(F)^7)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**14,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^14,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^14, x)
```

Mupad [B]
time = 5.08, size = 217, normalized size = 4.43

$$-\frac{\frac{F^a\left(\frac{10395\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\ln(F)}{\sqrt{b\ln(F)}\,(c+d\,x)}\right)}{128}-\frac{10395\,F^{\frac{b}{(c+d\,x)^2}}\sqrt{b\ln(F)}}{64\,(c+d\,x)}\right)}{\sqrt{b\ln(F)}}-\frac{693\,F^{a+\frac{b}{(c+d\,x)^2}}\,b^2\ln(F)^2}{16\,(c+d\,x)^5}+\frac{99\,F^{a+\frac{b}{(c+d\,x)^2}}\,b^3\ln(F)^3}{8\,(c+d\,x)^7}-\frac{11\,F^{a+\frac{b}{(c+d\,x)^2}}\,b^4\ln(F)^4}{4\,(c+d\,x)^9}+\frac{F^{a+\frac{b}{(c+d\,x)^2}}\,b^5\ln(F)^5}{2\,(c+d\,x)^{11}}+\frac{3465\,F^{a+\frac{b}{(c+d\,x)^2}}\,b\ln(F)}{32\,(c+d\,x)^3}}{b^6\,d\ln(F)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^14,x)
```

```
[Out] -((F^a*((10395*pi^(1/2)*erfi((b*log(F))/((b*log(F))^(1/2)*(c + d*x))))/128
- (10395*F^(b/(c + d*x)^2)*(b*log(F))^(1/2))/(64*(c + d*x))))/(b*log(F))^(1
/2) - (693*F^(a + b/(c + d*x)^2)*b^2*log(F)^2)/(16*(c + d*x)^5) + (99*F^(a
+ b/(c + d*x)^2)*b^3*log(F)^3)/(8*(c + d*x)^7) - (11*F^(a + b/(c + d*x)^2)*
b^4*log(F)^4)/(4*(c + d*x)^9) + (F^(a + b/(c + d*x)^2)*b^5*log(F)^5)/(2*(c
+ d*x)^11) + (3465*F^(a + b/(c + d*x)^2)*b*log(F))/(32*(c + d*x)^3))/(b^6*d
*log(F)^6)
```

3.340 $\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^m\,dx$

Optimal. Leaf size=61

$$\frac{F^a(c+dx)^{1+m}\Gamma\left(\frac{1}{3}(-1-m),-\frac{b\log(F)}{(c+dx)^3}\right)\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{\frac{1+m}{3}}}{3d}$$

```
[Out] 1/3*F^a*(d*x+c)^(1+m)*GAMMA(-1/3-1/3*m,-b*ln(F)/(d*x+c)^3)*(-b*ln(F)/(d*x+c
)^3)^(1/3+1/3*m)/d
```

Rubi [A]
time = 0.03, antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2250}

$$\frac{F^a(c+dx)^{m+1}\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{\frac{m+1}{3}}\text{Gamma}\left(\frac{1}{3}(-m-1),-\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)*(c + d*x)^m,x]
```

```
[Out] (F^a*(c + d*x)^(1 + m)*Gamma[(-1 - m)/3, -((b*Log[F])/(c + d*x)^3)]*(-((b*L
og[F])/(c + d*x)^3))^((1 + m)/3))/(3*d)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^m\,dx=\frac{F^a(c+dx)^{1+m}\Gamma\left(\frac{1}{3}(-1-m),-\frac{b\log(F)}{(c+dx)^3}\right)\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{\frac{1+m}{3}}}{3d}$$

Mathematica [A]
time = 0.03, size = 61, normalized size = 1.00

$$\frac{F^a(c+dx)^{1+m}\Gamma\left(\frac{1}{3}(-1-m),-\frac{b\log(F)}{(c+dx)^3}\right)\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{\frac{1+m}{3}}}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)*(c + d*x)^m,x]
```

```
[Out] (F^a*(c + d*x)^(1 + m)*Gamma[(-1 - m)/3, -((b*Log[F])/(c + d*x)^3)]*(-((b*L
og[F])/(c + d*x)^3))^((1 + m)/3))/(3*d)
```

Maple [F]
time = 0.03, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(dx+c)^3}} (dx+c)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^3)*(d*x+c)^m,x)
```

```
[Out] int(F^(a+b/(d*x+c)^3)*(d*x+c)^m,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^m,x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^m*F^(a + b/(d*x + c)^3), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^m,x, algorithm="fricas")
```

```
[Out] integral((d*x + c)^m*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 + 3*a*c^2*d*x + a*c^3 +
b)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)*(d*x+c)**m,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^m,x, algorithm="giac")
[Out] integrate((d*x + c)^m*F^(a + b/(d*x + c)^3), x)
```

Mupad [B]
time = 3.72, size = 73, normalized size = 1.20

$$\frac{F^a\,\mathrm{e}^{\frac{b\,\ln(F)}{2\,(c+d\,x)^3}}\,(c+d\,x)^{m+1}\,\mathrm{M}_{\frac{m}{6}+\frac{2}{3},-\frac{m}{6}-\frac{1}{6}}\left(\frac{b\,\ln(F)}{(c+d\,x)^3}\right)\,\left(\frac{b\,\ln(F)}{(c+d\,x)^3}\right)^{\frac{m}{6}-\frac{1}{3}}}{d\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)*(c + d*x)^m,x)
[Out] (F^a*exp((b*log(F))/(2*(c + d*x)^3))*(c + d*x)^(m + 1)*whittakerM(m/6 + 2/3
, - m/6 - 1/6, (b*log(F))/(c + d*x)^3)*((b*log(F))/(c + d*x)^3)^(m/6 - 1/3)
)/(d*(m + 1))
```

3.341 $\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^{14}\,dx$

Optimal. Leaf size=31

$$-\frac{b^5F^a\Gamma\left(-5,-\frac{b\log(F)}{(c+dx)^3}\right)\log^5(F)}{3d}$$

```
[Out] 1/3*F^a*(d*x+c)^15*Ei(6,-b*ln(F)/(d*x+c)^3)/d
```

Rubi [A]

time = 0.03, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$-\frac{b^5F^a\log^5(F)\text{Gamma}\left(-5,-\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)*(c + d*x)^14,x]
```

```
[Out] -1/3*(b^5*F^a*Gamma[-5, -((b*Log[F])/(c + d*x)^3)]*Log[F]^5)/d
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^{14}\,dx=-\frac{b^5F^a\Gamma\left(-5,-\frac{b\log(F)}{(c+dx)^3}\right)\log^5(F)}{3d}$$

Mathematica [A]

time = 0.01, size = 31, normalized size = 1.00

$$-\frac{b^5F^a\Gamma\left(-5,-\frac{b\log(F)}{(c+dx)^3}\right)\log^5(F)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)*(c + d*x)^14,x]
```

```
[Out] -1/3*(b^5*F^a*Gamma[-5, -((b*Log[F])/(c + d*x)^3)]*Log[F]^5)/d
```

Maple [F]
time = 0.03, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(dx+c)^3}}(dx+c)^{14}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^3)*(d*x+c)^14,x)
```

```
[Out] int(F^(a+b/(d*x+c)^3)*(d*x+c)^14,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^14,x, algorithm="maxima")
```

```
[Out] 1/360*(24*F^a*d^14*x^15 + 360*F^a*c*d^13*x^14 + 2520*F^a*c^2*d^12*x^13 + 6*
(1820*F^a*c^3*d^11 + F^a*b*d^11*log(F))*x^12 + 72*(455*F^a*c^4*d^10 + F^a*b
*c*d^10*log(F))*x^11 + 396*(182*F^a*c^5*d^9 + F^a*b*c^2*d^9*log(F))*x^10 +
2*(60060*F^a*c^6*d^8 + 660*F^a*b*c^3*d^8*log(F) + F^a*b^2*d^8*log(F)^2)*x^9
 + 18*(8580*F^a*c^7*d^7 + 165*F^a*b*c^4*d^7*log(F) + F^a*b^2*c*d^7*log(F)^2
)*x^8 + 72*(2145*F^a*c^8*d^6 + 66*F^a*b*c^5*d^6*log(F) + F^a*b^2*c^2*d^6*lo
g(F)^2)*x^7 + (120120*F^a*c^9*d^5 + 5544*F^a*b*c^6*d^5*log(F) + 168*F^a*b^2
*c^3*d^5*log(F)^2 + F^a*b^3*d^5*log(F)^3)*x^6 + 6*(12012*F^a*c^10*d^4 + 792
*F^a*b*c^7*d^4*log(F) + 42*F^a*b^2*c^4*d^4*log(F)^2 + F^a*b^3*c*d^4*log(F)^
3)*x^5 + 3*(10920*F^a*c^11*d^3 + 990*F^a*b*c^8*d^3*log(F) + 84*F^a*b^2*c^5*
d^3*log(F)^2 + 5*F^a*b^3*c^2*d^3*log(F)^3)*x^4 + (10920*F^a*c^12*d^2 + 1320
*F^a*b*c^9*d^2*log(F) + 168*F^a*b^2*c^6*d^2*log(F)^2 + 20*F^a*b^3*c^3*d^2*l
og(F)^3 + F^a*b^4*d^2*log(F)^4)*x^3 + 3*(840*F^a*c^13*d + 132*F^a*b*c^10*d*
log(F) + 24*F^a*b^2*c^7*d*log(F)^2 + 5*F^a*b^3*c^4*d*log(F)^3 + F^a*b^4*c*d
*log(F)^4)*x^2 + 3*(120*F^a*c^14 + 24*F^a*b*c^11*log(F) + 6*F^a*b^2*c^8*log
(F)^2 + 2*F^a*b^3*c^5*log(F)^3 + F^a*b^4*c^2*log(F)^4)*x)*F^(b/(d^3*x^3 + 3
*c*d^2*x^2 + 3*c^2*d*x + c^3)) + integrate(-1/120*(24*F^a*b*c^15*log(F) + 6
*F^a*b^2*c^12*log(F)^2 - F^a*b^5*d^3*x^3*log(F)^5 + 2*F^a*b^3*c^9*log(F)^3
- 3*F^a*b^5*c*d^2*x^2*log(F)^5 + F^a*b^4*c^6*log(F)^4 - 3*F^a*b^5*c^2*d*x*l
og(F)^5)*F^(b/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/(d^4*x^4 + 4*c*d^3
*x^3 + 6*c^2*d^2*x^2 + 4*c^3*d*x + c^4), x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 686 vs. $2(29) = 58$.
time = 0.11, size = 686, normalized size = 22.13

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^14,x, algorithm="fricas")
```

```
[Out] -1/360*(F^a*b^5*Ei(b*log(F)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))*log(
F)^5 - (24*d^15*x^15 + 360*c*d^14*x^14 + 2520*c^2*d^13*x^13 + 10920*c^3*d^1
2*x^12 + 32760*c^4*d^11*x^11 + 72072*c^5*d^10*x^10 + 120120*c^6*d^9*x^9 + 1
54440*c^7*d^8*x^8 + 154440*c^8*d^7*x^7 + 120120*c^9*d^6*x^6 + 72072*c^10*d^
5*x^5 + 32760*c^11*d^4*x^4 + 10920*c^12*d^3*x^3 + 2520*c^13*d^2*x^2 + 360*c
^14*d*x + 24*c^15 + (b^4*d^3*x^3 + 3*b^4*c*d^2*x^2 + 3*b^4*c^2*d*x + b^4*c^
3)*log(F)^4 + (b^3*d^6*x^6 + 6*b^3*c*d^5*x^5 + 15*b^3*c^2*d^4*x^4 + 20*b^3*
c^3*d^3*x^3 + 15*b^3*c^4*d^2*x^2 + 6*b^3*c^5*d*x + b^3*c^6)*log(F)^3 + 2*(b
^2*d^9*x^9 + 9*b^2*c*d^8*x^8 + 36*b^2*c^2*d^7*x^7 + 84*b^2*c^3*d^6*x^6 + 12
6*b^2*c^4*d^5*x^5 + 126*b^2*c^5*d^4*x^4 + 84*b^2*c^6*d^3*x^3 + 36*b^2*c^7*d
^2*x^2 + 9*b^2*c^8*d*x + b^2*c^9)*log(F)^2 + 6*(b*d^12*x^12 + 12*b*c*d^11*x
^11 + 66*b*c^2*d^10*x^10 + 220*b*c^3*d^9*x^9 + 495*b*c^4*d^8*x^8 + 792*b*c^
5*d^7*x^7 + 924*b*c^6*d^6*x^6 + 792*b*c^7*d^5*x^5 + 495*b*c^8*d^4*x^4 + 220
*b*c^9*d^3*x^3 + 66*b*c^10*d^2*x^2 + 12*b*c^11*d*x + b*c^12)*log(F))*F^((a*
d^3*x^3 + 3*a*c*d^2*x^2 + 3*a*c^2*d*x + a*c^3 + b)/(d^3*x^3 + 3*c*d^2*x^2 +
 3*c^2*d*x + c^3)))/d
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)*(d*x+c)**14,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^14,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^14*F^(a + b/(d*x + c)^3), x)
```

Mupad [B]
time = 4.02, size = 136, normalized size = 4.39

$$\frac{F^a\,b^5\,\ln\left(F\right)^5\,\mathrm{expint}\left(-\frac{b\,\ln(F)}{(c+d\,x)^3}\right)}{360\,d}+\frac{F^a\,F^{\frac{b}{(c+d\,x)^3}}\,b^5\,\ln\left(F\right)^5\,\left(\frac{(c+d\,x)^3}{120\,b\,\ln(F)}+\frac{(c+d\,x)^6}{120\,b^2\,\ln(F)^2}+\frac{(c+d\,x)^9}{60\,b^3\,\ln(F)^3}+\frac{(c+d\,x)^{12}}{20\,b^4\,\ln(F)^4}+\frac{(c+d\,x)^{15}}{5\,b^5\,\ln(F)^5}\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)*(c + d*x)^14,x)
```

```
[Out] (F^a*b^5*log(F)^5*expint(-(b*log(F))/(c + d*x)^3))/(360*d) + (F^a*F^(b/(c +
 d*x)^3)*b^5*log(F)^5*((c + d*x)^3/(120*b*log(F)) + (c + d*x)^6/(120*b^2*lo
g(F)^2) + (c + d*x)^9/(60*b^3*log(F)^3) + (c + d*x)^12/(20*b^4*log(F)^4) +
(c + d*x)^15/(5*b^5*log(F)^5)))/(3*d)
```

3.342 $\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^{11}\,dx$

Optimal. Leaf size=31

$$\frac{b^4F^a\Gamma\left(-4,-\frac{b\log(F)}{(c+dx)^3}\right)\log^4(F)}{3d}$$

```
[Out] 1/3*F^a*(d*x+c)^12*Ei(5,-b*ln(F)/(d*x+c)^3)/d
```

Rubi [A]
time = 0.03, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$\frac{b^4F^a\log^4(F)\text{Gamma}\left(-4,-\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)*(c + d*x)^11,x]
```

```
[Out] (b^4*F^a*Gamma[-4, -((b*Log[F])/(c + d*x)^3)]*Log[F]^4)/(3*d)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^{11}\,dx=\frac{b^4F^a\Gamma\left(-4,-\frac{b\log(F)}{(c+dx)^3}\right)\log^4(F)}{3d}$$

Mathematica [A]
time = 0.01, size = 31, normalized size = 1.00

$$\frac{b^4F^a\Gamma\left(-4,-\frac{b\log(F)}{(c+dx)^3}\right)\log^4(F)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)*(c + d*x)^11,x]
```

```
[Out] (b^4*F^a*Gamma[-4, -((b*Log[F])/(c + d*x)^3)]*Log[F]^4)/(3*d)
```

Maple [F]
time = 0.03, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(dx+c)^3}} (dx+c)^{11}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^3)*(d*x+c)^11,x)
```

```
[Out] int(F^(a+b/(d*x+c)^3)*(d*x+c)^11,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^11,x, algorithm="maxima")
```

```
[Out] 1/72*(6*F^a*d^11*x^12 + 72*F^a*c*d^10*x^11 + 396*F^a*c^2*d^9*x^10 + 2*(660*
F^a*c^3*d^8 + F^a*b*d^8*log(F))*x^9 + 18*(165*F^a*c^4*d^7 + F^a*b*c*d^7*log
(F))*x^8 + 72*(66*F^a*c^5*d^6 + F^a*b*c^2*d^6*log(F))*x^7 + (5544*F^a*c^6*d
^5 + 168*F^a*b*c^3*d^5*log(F) + F^a*b^2*d^5*log(F)^2)*x^6 + 6*(792*F^a*c^7*
d^4 + 42*F^a*b*c^4*d^4*log(F) + F^a*b^2*c*d^4*log(F)^2)*x^5 + 3*(990*F^a*c^
8*d^3 + 84*F^a*b*c^5*d^3*log(F) + 5*F^a*b^2*c^2*d^3*log(F)^2)*x^4 + (1320*F
^a*c^9*d^2 + 168*F^a*b*c^6*d^2*log(F) + 20*F^a*b^2*c^3*d^2*log(F)^2 + F^a*b
^3*d^2*log(F)^3)*x^3 + 3*(132*F^a*c^10*d + 24*F^a*b*c^7*d*log(F) + 5*F^a*b^
2*c^4*d*log(F)^2 + F^a*b^3*c*d*log(F)^3)*x^2 + 3*(24*F^a*c^11 + 6*F^a*b*c^8
*log(F) + 2*F^a*b^2*c^5*log(F)^2 + F^a*b^3*c^2*log(F)^3)*x)*F^(b/(d^3*x^3 +
 3*c*d^2*x^2 + 3*c^2*d*x + c^3)) + integrate(-1/24*(6*F^a*b*c^12*log(F) - F
^a*b^4*d^3*x^3*log(F)^4 + 2*F^a*b^2*c^9*log(F)^2 - 3*F^a*b^4*c*d^2*x^2*log(
F)^4 + F^a*b^3*c^6*log(F)^3 - 3*F^a*b^4*c^2*d*x*log(F)^4)*F^(b/(d^3*x^3 + 3
*c*d^2*x^2 + 3*c^2*d*x + c^3))/(d^4*x^4 + 4*c*d^3*x^3 + 6*c^2*d^2*x^2 + 4*c
^3*d*x + c^4), x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 487 vs. $2(29) = 58$.
time = 0.13, size = 487, normalized size = 15.71

$$-\frac{F^a b^4 \operatorname{Ei}\left(\frac{b\log(F)}{d^3x^3+3cd^2x^2+3c^2dx+c^3}\right)\log(F)^4 - \left(6d^{12}x^{12} + 72cd^{11}x^{11} + 396c^2d^{10}x^{10} + 1320c^3d^9x^9 + 2970c^4d^8x^8 + 4752c^5d^7x^7 + 5544c^6d^6x^6 + 4752c^7d^5x^5 + 2970c^8d^4x^4 + 1320c^9d^3x^3 + 396c^{10}d^2x^2 + 72c^{11}dx + 6c^{12} + (b^3d^3x^3 + 3b^3cd^2x^2 + 3b^3c^2dx + b^3c^3)\log(F)^3 + (b^2d^6x^6 + 6b^2cd^5x^5 + 15b^2c^2d^4x^4 + 20b^2c^3d^3x^3 + 15b^2c^4d^2x^2 + 6b^2c^5dx + b^2c^6)\log(F)^2 + 2(bd^9x^9 + 9bcd^8x^8 + 36bc^2d^7x^7 + 84bc^3d^6x^6 + 126bc^4d^5x^5 + 126bc^5d^4x^4 + 84bc^6d^3x^3 + 36bc^7d^2x^2 + 9bc^8dx + bc^9)\log(F)\right)F^{\frac{ad^3x^3+3acd^2x^2+3ac^2dx+ac^3+b}{d^3x^3+3cd^2x^2+3c^2dx+c^3}}}{72d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^11,x, algorithm="fricas")
```

```
[Out] -1/72*(F^a*b^4*Ei(b*log(F)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))*log(F
)^4 - (6*d^12*x^12 + 72*c*d^11*x^11 + 396*c^2*d^10*x^10 + 1320*c^3*d^9*x^9
+ 2970*c^4*d^8*x^8 + 4752*c^5*d^7*x^7 + 5544*c^6*d^6*x^6 + 4752*c^7*d^5*x^5
 + 2970*c^8*d^4*x^4 + 1320*c^9*d^3*x^3 + 396*c^10*d^2*x^2 + 72*c^11*d*x + 6
*c^12 + (b^3*d^3*x^3 + 3*b^3*c*d^2*x^2 + 3*b^3*c^2*d*x + b^3*c^3)*log(F)^3
+ (b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + 20*b^2*c^3*d^3*x^3
+ 15*b^2*c^4*d^2*x^2 + 6*b^2*c^5*d*x + b^2*c^6)*log(F)^2 + 2*(b*d^9*x^9 + 9
*b*c*d^8*x^8 + 36*b*c^2*d^7*x^7 + 84*b*c^3*d^6*x^6 + 126*b*c^4*d^5*x^5 + 12
6*b*c^5*d^4*x^4 + 84*b*c^6*d^3*x^3 + 36*b*c^7*d^2*x^2 + 9*b*c^8*d*x + b*c^9
)*log(F))*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 + 3*a*c^2*d*x + a*c^3 + b)/(d^3*x^3
 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)))/d
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)*(d*x+c)**11,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^11,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^11*F^(a + b/(d*x + c)^3), x)
```

Mupad [**B**]
time = 3.83, size = 120, normalized size = 3.87

$$\frac{F^a\,b^4\ln\left(F\right)^4\mathrm{expint}\left(-\frac{b\ln(F)}{(c+d\,x)^3}\right)}{72\,d}+\frac{F^a\,F^{\frac{b}{(c+d\,x)^3}}\,b^4\ln\left(F\right)^4\left(\frac{(c+d\,x)^3}{24\,b\ln(F)}+\frac{(c+d\,x)^6}{24\,b^2\ln(F)^2}+\frac{(c+d\,x)^9}{12\,b^3\ln(F)^3}+\frac{(c+d\,x)^{12}}{4\,b^4\ln(F)^4}\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)*(c + d*x)^11,x)
```

```
[Out] (F^a*b^4*log(F)^4*expint(-(b*log(F))/(c + d*x)^3))/(72*d) + (F^a*F^(b/(c +
d*x)^3)*b^4*log(F)^4*((c + d*x)^3/(24*b*log(F)) + (c + d*x)^6/(24*b^2*log(F
)^2) + (c + d*x)^9/(12*b^3*log(F)^3) + (c + d*x)^12/(4*b^4*log(F)^4)))/(3*d
)
```

3.343 $\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^8\,dx$

Optimal. Leaf size=121

$$\frac{F^{a+\frac{b}{(c+dx)^3}}(c+dx)^9}{9d}+\frac{bF^{a+\frac{b}{(c+dx)^3}}(c+dx)^6\log(F)}{18d}+\frac{b^2F^{a+\frac{b}{(c+dx)^3}}(c+dx)^3\log^2(F)}{18d}-\frac{b^3F^a\text{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)\log^3(F)}{18d}$$

```
[Out] 1/9*F^(a+b/(d*x+c)^3)*(d*x+c)^9/d+1/18*b*F^(a+b/(d*x+c)^3)*(d*x+c)^6*ln(F)/
d+1/18*b^2*F^(a+b/(d*x+c)^3)*(d*x+c)^3*ln(F)^2/d-1/18*b^3*F^a*Ei(b*ln(F)/(d
*x+c)^3)*ln(F)^3/d
```

Rubi [A]
time = 0.13, antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2245, 2241}

$$-\frac{b^3F^a\log^3(F)\text{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)}{18d}+\frac{b^2\log^2(F)(c+dx)^3F^{a+\frac{b}{(c+dx)^3}}}{18d}+\frac{(c+dx)^9F^{a+\frac{b}{(c+dx)^3}}}{9d}+\frac{b\log(F)(c+dx)^6F^{a+\frac{b}{(c+dx)^3}}}{18d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)*(c + d*x)^8,x]
```

```
[Out] (F^(a + b/(c + d*x)^3)*(c + d*x)^9)/(9*d) + (b*F^(a + b/(c + d*x)^3)*(c + d
*x)^6*Log[F])/(18*d) + (b^2*F^(a + b/(c + d*x)^3)*(c + d*x)^3*Log[F]^2)/(18
*d) - (b^3*F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)^3]*Log[F]^3)/(18*d)
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^8\,dx = \frac{F^{a+\frac{b}{(c+dx)^3}}(c+dx)^9}{9d} + \frac{1}{3}(b\log(F))\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^5\,dx$$
$$= \frac{F^{a+\frac{b}{(c+dx)^3}}(c+dx)^9}{9d} + \frac{bF^{a+\frac{b}{(c+dx)^3}}(c+dx)^6\log(F)}{18d} + \frac{1}{6}\left(b^2\log^2(F)\right)\int F^{a+\frac{b}{(c+dx)^3}}$$
$$= \frac{F^{a+\frac{b}{(c+dx)^3}}(c+dx)^9}{9d} + \frac{bF^{a+\frac{b}{(c+dx)^3}}(c+dx)^6\log(F)}{18d} + \frac{b^2F^{a+\frac{b}{(c+dx)^3}}(c+dx)^3\log^2(}{18d}$$
$$= \frac{F^{a+\frac{b}{(c+dx)^3}}(c+dx)^9}{9d} + \frac{bF^{a+\frac{b}{(c+dx)^3}}(c+dx)^6\log(F)}{18d} + \frac{b^2F^{a+\frac{b}{(c+dx)^3}}(c+dx)^3\log^2(}{18d}$$

Mathematica [A]
time = 0.14, size = 96, normalized size = 0.79

$$\frac{F^a\left(2F^{\frac{b}{(c+dx)^3}}(c+dx)^9 + b\log(F)\left(F^{\frac{b}{(c+dx)^3}}(c+dx)^6 + b\log(F)\left(F^{\frac{b}{(c+dx)^3}}(c+dx)^3 - b\text{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)\log(F)\right)\right)\right)}{18d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)*(c + d*x)^8,x]
```

```
[Out] (F^a*(2*F^(b/(c + d*x)^3)*(c + d*x)^9 + b*Log[F]*(F^(b/(c + d*x)^3)*(c + d*
x)^6 + b*Log[F]*(F^(b/(c + d*x)^3)*(c + d*x)^3 - b*ExpIntegralEi[(b*Log[F])
/(c + d*x)^3]*Log[F]))))/(18*d)
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(dx+c)^3}}(dx+c)^8\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^3)*(d*x+c)^8,x)
```

```
[Out] int(F^(a+b/(d*x+c)^3)*(d*x+c)^8,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^8,x, algorithm="maxima")
```

[Out] 1/18*(2*F^a*d^8*x^9 + 18*F^a*c*d^7*x^8 + 72*F^a*c^2*d^6*x^7 + (168*F^a*c^3*d^5 + F^a*b*d^5*log(F))*x^6 + 6*(42*F^a*c^4*d^4 + F^a*b*c*d^4*log(F))*x^5 + 3*(84*F^a*c^5*d^3 + 5*F^a*b*c^2*d^3*log(F))*x^4 + (168*F^a*c^6*d^2 + 20*F^a*b*c^3*d^2*log(F) + F^a*b^2*d^2*log(F)^2)*x^3 + 3*(24*F^a*c^7*d + 5*F^a*b*c^4*d*log(F) + F^a*b^2*c*d*log(F)^2)*x^2 + 3*(6*F^a*c^8 + 2*F^a*b*c^5*log(F) + F^a*b^2*c^2*log(F)^2)*x)*F^(b/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)) + integrate(1/6*(F^a*b^3*d^3*x^3*log(F)^3 - 2*F^a*b*c^9*log(F) + 3*F^a*b^3*c*d^2*x^2*log(F)^3 - F^a*b^2*c^6*log(F)^2 + 3*F^a*b^3*c^2*d*x*log(F)^3)*F^(b/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/(d^4*x^4 + 4*c*d^3*x^3 + 6*c^2*d^2*x^2 + 4*c^3*d*x + c^4), x)

Fricas [**B**] Leaf count of result is larger than twice the leaf count of optimal. 330 vs. $2(113) = 226$.
time = 0.37, size = 330, normalized size = 2.73

$$-\frac{F^{a} b^{3} \mathrm{Ei}\left(\frac{b \log(F)}{d^{3} x^{3}+3 c d^{2} x^{2}+3 c^{2} d x+c^{3}}\right) \log\left(F\right)^{3}-\left(2 d^{9} x^{9}+18 c d^{8} x^{8}+72 c^{2} d^{7} x^{7}+168 c^{3} d^{6} x^{6}+252 c^{4} d^{5} x^{5}+252 c^{5} d^{4} x^{4}+168 c^{6} d^{3} x^{3}+72 c^{7} d^{2} x^{2}+18 c^{8} d x+2 c^{9}+\left(b^{2} d^{3} x^{3}+3 b^{2} c d^{2} x^{2}+3 b^{2} c^{2} d x+b^{2} c^{3}\right) \log\left(F\right)^{2}+\left(b d^{6} x^{6}+6 b c d^{5} x^{5}+15 b c^{2} d^{4} x^{4}+20 b c^{3} d^{3} x^{3}+15 b c^{4} d^{2} x^{2}+6 b c^{5} d x+b c^{6}\right) \log\left(F\right)\right) F^{\frac{a d^{3} x^{3}+3 a c d^{2} x^{2}+3 a c^{2} d x+a c^{3}+b}{d^{3} x^{3}+3 c d^{2} x^{2}+3 c^{2} d x+c^{3}}}}{18 d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^8,x, algorithm="fricas")
```

[Out] -1/18*(F^a*b^3*Ei(b*log(F)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))*log(F)^3 - (2*d^9*x^9 + 18*c*d^8*x^8 + 72*c^2*d^7*x^7 + 168*c^3*d^6*x^6 + 252*c^4*d^5*x^5 + 252*c^5*d^4*x^4 + 168*c^6*d^3*x^3 + 72*c^7*d^2*x^2 + 18*c^8*d*x + 2*c^9 + (b^2*d^3*x^3 + 3*b^2*c*d^2*x^2 + 3*b^2*c^2*d*x + b^2*c^3)*log(F)^2 + (b*d^6*x^6 + 6*b*c*d^5*x^5 + 15*b*c^2*d^4*x^4 + 20*b*c^3*d^3*x^3 + 15*b*c^4*d^2*x^2 + 6*b*c^5*d*x + b*c^6)*log(F))*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 + 3*a*c^2*d*x + a*c^3 + b)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)))/d

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)*(d*x+c)**8,x)
```

[Out] Timed out

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^8,x, algorithm="giac")
```

[Out] integrate((d*x + c)^8*F^(a + b/(d*x + c)^3), x)

Mupad [B]
time = 3.87, size = 92, normalized size = 0.76

$$\frac{F^a\,b^3\ln\left(F\right)^3\left(\frac{\mathrm{expint}\left(-\frac{b\,\ln(F)}{(c+d\,x)^3}\right)}{6}+F^{\frac{b}{(c+d\,x)^3}}\,\left(\frac{(c+d\,x)^3}{6\,b\,\ln(F)}+\frac{(c+d\,x)^6}{6\,b^2\ln(F)^2}+\frac{(c+d\,x)^9}{3\,b^3\ln(F)^3}\right)\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)*(c + d*x)^8,x)
```

```
[Out] (F^a*b^3*log(F)^3*(expint(-(b*log(F))/(c + d*x)^3)/6 + F^(b/(c + d*x)^3)*((
c + d*x)^3/(6*b*log(F)) + (c + d*x)^6/(6*b^2*log(F)^2) + (c + d*x)^9/(3*b^3
*log(F)^3))))/(3*d)
```

3.344 $\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^5\,dx$

Optimal. Leaf size=87

$$\frac{F^{a+\frac{b}{(c+dx)^3}}(c+dx)^6}{6d}+\frac{bF^{a+\frac{b}{(c+dx)^3}}(c+dx)^3\log(F)}{6d}-\frac{b^2F^a\mathrm{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)\log^2(F)}{6d}$$

```
[Out] 1/6*F^(a+b/(d*x+c)^3)*(d*x+c)^6/d+1/6*b*F^(a+b/(d*x+c)^3)*(d*x+c)^3*ln(F)/d
-1/6*b^2*F^a*Ei(b*ln(F)/(d*x+c)^3)*ln(F)^2/d
```

Rubi [A]

time = 0.10, antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}=0.095$, Rules used = {2245, 2241}

$$-\frac{b^2F^a\log^2(F)\mathrm{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)}{6d}+\frac{(c+dx)^6F^{a+\frac{b}{(c+dx)^3}}}{6d}+\frac{b\log(F)(c+dx)^3F^{a+\frac{b}{(c+dx)^3}}}{6d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)*(c + d*x)^5,x]
```

```
[Out] (F^(a + b/(c + d*x)^3)*(c + d*x)^6)/(6*d) + (b*F^(a + b/(c + d*x)^3)*(c + d
*x)^3*Log[F])/(6*d) - (b^2*F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)^3]*Log[F]
^2)/(6*d)
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^5\,dx = \frac{F^{a+\frac{b}{(c+dx)^3}}(c+dx)^6}{6d}+\frac{1}{2}(b\log(F))\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^2\,dx$$
$$= \frac{F^{a+\frac{b}{(c+dx)^3}}(c+dx)^6}{6d}+\frac{bF^{a+\frac{b}{(c+dx)^3}}(c+dx)^3\log(F)}{6d}+\frac{1}{2}\left(b^2\log^2(F)\right)\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{c+dx}$$
$$= \frac{F^{a+\frac{b}{(c+dx)^3}}(c+dx)^6}{6d}+\frac{bF^{a+\frac{b}{(c+dx)^3}}(c+dx)^3\log(F)}{6d}-\frac{b^2F^a\text{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)\log^2(F)}{6d}$$

Mathematica [A]
time = 0.04, size = 71, normalized size = 0.82

$$\frac{F^a\left(F^{\frac{b}{(c+dx)^3}}(c+dx)^6+b\log(F)\left(F^{\frac{b}{(c+dx)^3}}(c+dx)^3-b\text{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)\log(F)\right)\right)}{6d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)*(c + d*x)^5,x]
```

```
[Out] (F^a*(F^(b/(c + d*x)^3)*(c + d*x)^6 + b*Log[F]*(F^(b/(c + d*x)^3)*(c + d*x)
^3 - b*ExpIntegralEi[(b*Log[F])/(c + d*x)^3]*Log[F])))/(6*d)
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(dx+c)^3}}(dx+c)^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^3)*(d*x+c)^5,x)
```

```
[Out] int(F^(a+b/(d*x+c)^3)*(d*x+c)^5,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^5,x, algorithm="maxima")
```

```
[Out] 1/6*(F^a*d^5*x^6 + 6*F^a*c*d^4*x^5 + 15*F^a*c^2*d^3*x^4 + (20*F^a*c^3*d^2 +
 F^a*b*d^2*log(F))*x^3 + 3*(5*F^a*c^4*d + F^a*b*c*d*log(F))*x^2 + 3*(2*F^a*
c^5 + F^a*b*c^2*log(F))*x)*F^(b/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))
```

```
+ integrate(1/2*(F^a*b^2*d^3*x^3*log(F)^2 + 3*F^a*b^2*c*d^2*x^2*log(F)^2 -
F^a*b*c^6*log(F) + 3*F^a*b^2*c^2*d*x*log(F)^2)*F^(b/(d^3*x^3 + 3*c*d^2*x^2
+ 3*c^2*d*x + c^3))/(d^4*x^4 + 4*c*d^3*x^3 + 6*c^2*d^2*x^2 + 4*c^3*d*x + c^
4), x)
```

Fricas [**B**] Leaf count of result is larger than twice the leaf count of optimal. 213 vs. $2(81) = 162$.
time = 0.42, size = 213, normalized size = 2.45

$$-\frac{F^a b^2 \operatorname{Ei}\left(\frac{b\log(F)}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)\log\left(F\right)^2-\left(d^6x^6+6\,cd^5x^5+15\,c^2d^4x^4+20\,c^3d^3x^3+15\,c^4d^2x^2+6\,c^5dx+c^6+\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3\right)\log\left(F\right)\right)F^{\frac{ad^3x^3+3\,acd^2x^2+3\,ac^2dx+ac^3+b}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}}}{6\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^5,x, algorithm="fricas")
```

```
[Out] -1/6*(F^a*b^2*Ei(b*log(F)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))*log(F)
^2 - (d^6*x^6 + 6*c*d^5*x^5 + 15*c^2*d^4*x^4 + 20*c^3*d^3*x^3 + 15*c^4*d^2*
x^2 + 6*c^5*d*x + c^6 + (b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*l
og(F))*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 + 3*a*c^2*d*x + a*c^3 + b)/(d^3*x^3 +
3*c*d^2*x^2 + 3*c^2*d*x + c^3)))/d
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(c+dx)^3}}\left(c+dx\right)^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)*(d*x+c)**5,x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**3)*(c + d*x)**5, x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^5,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^5*F^(a + b/(d*x + c)^3), x)
```

Mupad [**B**]
time = 3.59, size = 76, normalized size = 0.87

$$\frac{F^a\,b^2\ln\left(F\right)^2\left(\frac{\mathrm{expint}\left(-\frac{b\,\ln(F)}{(c+d\,x)^3}\right)}{2}+F^{\frac{b}{(c+d\,x)^3}}\,\left(\frac{(c+d\,x)^3}{2\,b\,\ln(F)}+\frac{(c+d\,x)^6}{2\,b^2\,\ln(F)^2}\right)\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)*(c + d*x)^5,x)
```

```
[Out] (F^a*b^2*log(F)^2*(expint(-(b*log(F))/(c + d*x)^3)/2 + F^(b/(c + d*x)^3)*((
c + d*x)^3/(2*b*log(F)) + (c + d*x)^6/(2*b^2*log(F)^2))))/(3*d)
```

3.345 $\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^2\,dx$

Optimal. Leaf size=53

$$\frac{F^{a+\frac{b}{(c+dx)^3}}(c+dx)^3}{3d}-\frac{bF^a\text{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)\log(F)}{3d}$$

```
[Out] 1/3*F^(a+b/(d*x+c)^3)*(d*x+c)^3/d-1/3*b*F^a*Ei(b*ln(F)/(d*x+c)^3)*ln(F)/d
```

Rubi [A]
time = 0.06, antiderivative size = 53, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2245, 2241}

$$\frac{(c+dx)^3F^{a+\frac{b}{(c+dx)^3}}}{3d}-\frac{bF^a\log(F)\text{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)*(c + d*x)^2,x]
```

```
[Out] (F^(a + b/(c + d*x)^3)*(c + d*x)^3)/(3*d) - (b*F^a*ExpIntegralEi[(b*Log[F])
/(c + d*x)^3]*Log[F])/(3*d)
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^2\,dx&=\frac{F^{a+\frac{b}{(c+dx)^3}}(c+dx)^3}{3d}+(b\log(F))\int\frac{F^{a+\frac{b}{(c+dx)^3}}}{c+dx}\,dx\\&=\frac{F^{a+\frac{b}{(c+dx)^3}}(c+dx)^3}{3d}-\frac{bF^a\text{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)\log(F)}{3d}\end{aligned}$$

Mathematica [A]
time = 0.02, size = 47, normalized size = 0.89

$$\frac{F^a\left(F^{\frac{b}{(c+dx)^3}}(c+dx)^3-b\text{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)\log(F)\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)*(c + d*x)^2,x]
```

```
[Out] (F^a*(F^(b/(c + d*x)^3)*(c + d*x)^3 - b*ExpIntegralEi[(b*Log[F])/(c + d*x)^
3]*Log[F]))/(3*d)
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(dx+c)^3}}(dx+c)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^3)*(d*x+c)^2,x)
```

```
[Out] int(F^(a+b/(d*x+c)^3)*(d*x+c)^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^2,x, algorithm="maxima")
```

```
[Out] 1/3*(F^a*d^2*x^3 + 3*F^a*c*d*x^2 + 3*F^a*c^2*x)*F^(b/(d^3*x^3 + 3*c*d^2*x^2
 + 3*c^2*d*x + c^3)) + integrate((F^a*b*d^3*x^3*log(F) + 3*F^a*b*c*d^2*x^2*
log(F) + 3*F^a*b*c^2*d*x*log(F))*F^(b/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x +
c^3))/(d^4*x^4 + 4*c*d^3*x^3 + 6*c^2*d^2*x^2 + 4*c^3*d*x + c^4), x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 141 vs. $2(49) = 98$.
time = 0.36, size = 141, normalized size = 2.66

$$-\frac{F^a b\text{Ei}\left(\frac{b\log(F)}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)\log\left(F\right)-\left(d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3\right)F^{\frac{ad^3x^3+3\,acd^2x^2+3\,ac^2dx+ac^3+b}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}}}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] -1/3*(F^a*b*Ei(b*log(F)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))*log(F) -
 (d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 +
3*a*c^2*d*x + a*c^3 + b)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)))/d
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)*(d*x+c)**2,x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**3)*(c + d*x)**2, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^2,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^2*F^(a + b/(d*x + c)^3), x)
```

Mupad [B]
time = 3.72, size = 51, normalized size = 0.96

$$\frac{F^a\,F^{\frac{b}{{(c+d\,x)}^3}}\,{\left(c+d\,x\right)}^3}{3\,d}+\frac{F^a\,b\,\ln\left(F\right)\,\mathrm{expint}\left(-\frac{b\,\ln(F)}{{(c+d\,x)}^3}\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)*(c + d*x)^2,x)
```

```
[Out] (F^a*F^(b/(c + d*x)^3)*(c + d*x)^3)/(3*d) + (F^a*b*log(F)*expint(-(b*log(F)
)/(c + d*x)^3))/(3*d)
```

3.346 $\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{c+dx}\,dx$

Optimal. Leaf size=22

$$-\frac{F^a \operatorname{Ei}\left(\frac{b \log(F)}{(c+dx)^3}\right)}{3d}$$

```
[Out] -1/3*F^a*Ei(b*ln(F)/(d*x+c)^3)/d
```

Rubi [A]
time = 0.03, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2241}

$$-\frac{F^a \operatorname{Ei}\left(\frac{b \log(F)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)/(c + d*x),x]
```

```
[Out] -1/3*(F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)^3])/d
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{c+dx}\,dx = -\frac{F^a \operatorname{Ei}\left(\frac{b \log(F)}{(c+dx)^3}\right)}{3d}$$

Mathematica [A]
time = 0.01, size = 22, normalized size = 1.00

$$-\frac{F^a \operatorname{Ei}\left(\frac{b \log(F)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)/(c + d*x),x]
```

```
[Out] -1/3*(F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)^3])/d
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^3}}}{dx+c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^3)/(d*x+c),x)
[Out] int(F^(a+b/(d*x+c)^3)/(d*x+c),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c),x, algorithm="maxima")
[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c), x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 42 vs. $2(20) = 40$.
time = 0.39, size = 42, normalized size = 1.91

$$-\frac{F^a \mathrm{Ei}\left(\frac{b\log(F)}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c),x, algorithm="fricas")
[Out] -1/3*F^a*Ei(b*log(F)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/d
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{c+dx}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)/(d*x+c),x)
[Out] Integral(F**(a + b/(c + d*x)**3)/(c + d*x), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c),x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c), x)
```

Mupad [B]
time = 3.72, size = 20, normalized size = 0.91

$$-\frac{F^a\,\mathrm{ei}\left(\frac{b\,\ln\left(F\right)}{{\left(c+d\,x\right)}^3}\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)/(c + d*x),x)
```

```
[Out] -(F^a*ei((b*log(F))/(c + d*x)^3))/(3*d)
```

3.347 $\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^4} dx$

Optimal. Leaf size=27

$$-\frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd\log(F)}$$

```
[Out] -1/3*F^(a+b/(d*x+c)^3)/b/d/ln(F)
```

Rubi [A]
time = 0.03, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2240}

$$-\frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)/(c + d*x)^4,x]
```

```
[Out] -1/3*F^(a + b/(c + d*x)^3)/(b*d*Log[F])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^4} dx = -\frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd\log(F)}$$

Mathematica [A]
time = 0.01, size = 27, normalized size = 1.00

$$-\frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)/(c + d*x)^4,x]
```

```
[Out] -1/3*F^(a + b/(c + d*x)^3)/(b*d*Log[F])
```

Maple [A]
time = 0.06, size = 26, normalized size = 0.96

method	result	size
derivativedivides	$-\frac{F^{a+\frac{b}{(dx+c)^3}}}{3bd\ln(F)}$	26
default	$-\frac{F^{a+\frac{b}{(dx+c)^3}}}{3bd\ln(F)}$	26
risch	$-\frac{F^{\frac{a\,d^3x^3+3ac\,d^2x^2+3a\,c^2dx+a\,c^3+b}{(dx+c)^3}}}{3bd\ln(F)}$	56
norman	$\frac{-\frac{c^3 e^{\left(a+\frac{b}{(dx+c)^3}\right)\ln(F)}}{3\ln(F)bd}-\frac{c^2 x\, e^{\left(a+\frac{b}{(dx+c)^3}\right)\ln(F)}}{\ln(F)b}-\frac{d^2x^3 e^{\left(a+\frac{b}{(dx+c)^3}\right)\ln(F)}}{3\ln(F)b}-\frac{dc\,x^2 e^{\left(a+\frac{b}{(dx+c)^3}\right)\ln(F)}}{\ln(F)b}}{(dx+c)^3}$	127

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^3)/(d*x+c)^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*F^(a+b/(d*x+c)^3)/b/d/ln(F)
```

Maxima [A]
time = 0.28, size = 25, normalized size = 0.93

$$-\frac{F^{a+\frac{b}{(dx+c)^3}}}{3\,bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^4,x, algorithm="maxima")
```

```
[Out] -1/3*F^(a + b/(d*x + c)^3)/(b*d*log(F))
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 77 vs. $2(25) = 50$.
time = 0.34, size = 77, normalized size = 2.85

$$-\frac{F^{\frac{ad^3x^3+3\,acd^2x^2+3\,ac^2dx+ac^3+b}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}}}{3\,bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] -1/3*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 + 3*a*c^2*d*x + a*c^3 + b)/(d^3*x^3 + 3*
c*d^2*x^2 + 3*c^2*d*x + c^3))/(b*d*log(F))
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 65 vs. $2(20) = 40$.
time = 0.17, size = 65, normalized size = 2.41

$$\begin{cases} -\frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd\log(F)} & \text{for } bd\log(F) \neq 0 \\ -\frac{1}{3c^3d+9c^2d^2x+9cd^3x^2+3d^4x^3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)/(d*x+c)**4,x)
```

```
[Out] Piecewise((-F**(a + b/(c + d*x)**3)/(3*b*d*log(F)), Ne(b*d*log(F), 0)), (-1
/(3*c**3*d + 9*c**2*d**2*x + 9*c*d**3*x**2 + 3*d**4*x**3), True))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 77 vs. $2(25) = 50$.
time = 2.22, size = 77, normalized size = 2.85

$$-\frac{F^{\frac{ad^3x^3+3\,acd^2x^2+3\,ac^2dx+ac^3+b}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}}}{3\,bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^4,x, algorithm="giac")
```

```
[Out] -1/3*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 + 3*a*c^2*d*x + a*c^3 + b)/(d^3*x^3 + 3*
c*d^2*x^2 + 3*c^2*d*x + c^3))/(b*d*log(F))
```

Mupad [B]
time = 3.64, size = 48, normalized size = 1.78

$$-\frac{F^a\,F^{\frac{b}{c^3+3\,c^2\,d\,x+3\,c\,d^2\,x^2+d^3\,x^3}}}{3\,b\,d\,\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)/(c + d*x)^4,x)
```

```
[Out] -(F^a*F^(b/(c^3 + d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x)))/(3*b*d*log(F))
```

3.348 $\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^7} dx$

Optimal. Leaf size=62

$$\frac{F^{a+\frac{b}{(c+dx)^3}}}{3b^2d\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd(c+dx)^3\log(F)}$$

```
[Out] 1/3*F^(a+b/(d*x+c)^3)/b^2/d/ln(F)^2-1/3*F^(a+b/(d*x+c)^3)/b/d/(d*x+c)^3/ln(
F)
```

Rubi [A]
time = 0.06, antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2243, 2240}

$$\frac{F^{a+\frac{b}{(c+dx)^3}}}{3b^2d\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd\log(F)(c+dx)^3}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)/(c + d*x)^7,x]
```

```
[Out] F^(a + b/(c + d*x)^3)/(3*b^2*d*Log[F]^2) - F^(a + b/(c + d*x)^3)/(3*b*d*(c
+ d*x)^3*Log[F])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^7}\,dx = -\frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd(c+dx)^3\log(F)} - \frac{\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^4}\,dx}{b\log(F)}$$
$$= \frac{F^{a+\frac{b}{(c+dx)^3}}}{3b^2d\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd(c+dx)^3\log(F)}$$

Mathematica [A]
time = 0.02, size = 47, normalized size = 0.76

$$\frac{F^{a+\frac{b}{(c+dx)^3}}\left((c+dx)^3 - b\log(F)\right)}{3b^2d(c+dx)^3\log^2(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)/(c + d*x)^7,x]
```

```
[Out] (F^(a + b/(c + d*x)^3)*((c + d*x)^3 - b*Log[F]))/(3*b^2*d*(c + d*x)^3*Log[F
]^2)
```

Maple [A]
time = 0.07, size = 97, normalized size = 1.56

method	result
risch	$-\frac{\left(-d^{3} x^{3}-3 c\,d^{2} x^{2}-3 c^{2} d x-c^{3}+b \ln \left(F\right)\right) F^{\frac{a\,d^{3} x^{3}+3 a c\,d^{2} x^{2}+3 a\,c^{2} d x+a\,c^{3}+b}{\left(d x+c\right)^{3}}}}{3 d \ln \left(F\right)^{2} b^{2} \left(d x+c\right)^{3}}$
norman	$\frac{\frac{d^{5} x^{6} {\mathrm e}^{\left(a+\frac{b}{\left(d x+c\right)^{3}}\right) \ln \left(F\right)}}{3 \ln \left(F\right)^{2} b^{2}}-\frac{c^{2} \left(-2 c^{3}+b \ln \left(F\right)\right) x\,{\mathrm e}^{\left(a+\frac{b}{\left(d x+c\right)^{3}}\right) \ln \left(F\right)}}{\ln \left(F\right)^{2} b^{2}}-\frac{c^{3} \left(-c^{3}+b \ln \left(F\right)\right) {\mathrm e}^{\left(a+\frac{b}{\left(d x+c\right)^{3}}\right) \ln \left(F\right)}}{3 d \ln \left(F\right)^{2} b^{2}}-\frac{d^{2} \left(-20 c^{3}+b \ln \left(F\right)\right) x^{3} {\mathrm e}^{\left(a+\right.}}{3 \ln \left(F\right)^{2} b^{2}}}{\left(d x+c\right)^{6}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^3)/(d*x+c)^7,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*(-d^3*x^3-3*c*d^2*x^2-3*c^2*d*x-c^3+b*ln(F))/d/ln(F)^2/b^2/(d*x+c)^3*F
^((a*d^3*x^3+3*a*c*d^2*x^2+3*a*c^2*d*x+a*c^3+b)/(d*x+c)^3)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 144 vs. 2(58) = 116.
time = 0.28, size = 144, normalized size = 2.32

$$\frac{\left(F^{a} d^{3} x^{3} + 3\,F^{a} c d^{2} x^{2} + 3\,F^{a} c^{2} d x + F^{a} c^{3} - F^{a} b \log\left(F\right)\right) F^{\frac{b}{d^{3} x^{3} + 3\,c d^{2} x^{2} + 3\,c^{2} d x + c^{3}}}}{3\,\left(b^{2} d^{4} x^{3} \log\left(F\right)^{2} + 3\,b^{2} c d^{3} x^{2} \log\left(F\right)^{2} + 3\,b^{2} c^{2} d^{2} x \log\left(F\right)^{2} + b^{2} c^{3} d \log\left(F\right)^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^7,x, algorithm="maxima")
```

```
[Out] 1/3*(F^a*d^3*x^3 + 3*F^a*c*d^2*x^2 + 3*F^a*c^2*d*x + F^a*c^3 - F^a*b*log(F)
)*F^(b/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/(b^2*d^4*x^3*log(F)^2 + 3
*b^2*c*d^3*x^2*log(F)^2 + 3*b^2*c^2*d^2*x*log(F)^2 + b^2*c^3*d*log(F)^2)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 148 vs. $2(58) = 116$.
time = 0.36, size = 148, normalized size = 2.39

$$\frac{(d^3x^3 + 3\,cd^2x^2 + 3\,c^2dx + c^3 - b\log(F))F^{\frac{ad^3x^3+3\,acd^2x^2+3\,ac^2dx+ac^3+b}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}}}{3\,(b^2d^4x^3 + 3\,b^2cd^3x^2 + 3\,b^2c^2d^2x + b^2c^3d)\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^7,x, algorithm="fricas")
```

```
[Out] 1/3*(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3 - b*log(F))*F^((a*d^3*x^3 + 3*
a*c*d^2*x^2 + 3*a*c^2*d*x + a*c^3 + b)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x +
 c^3))/((b^2*d^4*x^3 + 3*b^2*c*d^3*x^2 + 3*b^2*c^2*d^2*x + b^2*c^3*d)*log(F
)^2)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 114 vs. $2(49) = 98$.
time = 0.15, size = 114, normalized size = 1.84

$$\frac{F^{a+\frac{b}{(c+dx)^3}}\left(-b\log(F) + c^3 + 3c^2dx + 3cd^2x^2 + d^3x^3\right)}{3b^2c^3d\log(F)^2 + 9b^2c^2d^2x\log(F)^2 + 9b^2cd^3x^2\log(F)^2 + 3b^2d^4x^3\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)/(d*x+c)**7,x)
```

```
[Out] F**(a + b/(c + d*x)**3)*(-b*log(F) + c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d*
*3*x**3)/(3*b**2*c**3*d*log(F)**2 + 9*b**2*c**2*d**2*x*log(F)**2 + 9*b**2*c
*d**3*x**2*log(F)**2 + 3*b**2*d**4*x**3*log(F)**2)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^7,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c)^7, x)
```

Mupad [B]
time = 3.89, size = 136, normalized size = 2.19

$$\frac{F^a\,F^{\frac{b}{c^3+3\,c^2\,d\,x+3\,c\,d^2\,x^2+d^3\,x^3}}\,\left(\frac{x^3}{3\,b^2\,d\ln(F)^2}-\frac{b\,\ln(F)-c^3}{3\,b^2\,d^4\ln(F)^2}+\frac{c\,x^2}{b^2\,d^2\ln(F)^2}+\frac{c^2\,x}{b^2\,d^3\ln(F)^2}\right)}{x^3+\frac{c^3}{d^3}+\frac{3\,c\,x^2}{d}+\frac{3\,c^2\,x}{d^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)/(c + d*x)^7,x)
```

```
[Out] (F^a*F^(b/(c^3 + d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x))*(x^3/(3*b^2*d*log(F)^2
) - (b*log(F) - c^3)/(3*b^2*d^4*log(F)^2) + (c*x^2)/(b^2*d^2*log(F)^2) + (c
^2*x)/(b^2*d^3*log(F)^2)))/(x^3 + c^3/d^3 + (3*c*x^2)/d + (3*c^2*x)/d^2)
```

3.349 $\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^{10}}\,dx$

Optimal. Leaf size=96

$$-\frac{2F^{a+\frac{b}{(c+dx)^3}}}{3b^3d\log^3(F)}+\frac{2F^{a+\frac{b}{(c+dx)^3}}}{3b^2d(c+dx)^3\log^2(F)}-\frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd(c+dx)^6\log(F)}$$

```
[Out] -2/3*F^(a+b/(d*x+c)^3)/b^3/d/ln(F)^3+2/3*F^(a+b/(d*x+c)^3)/b^2/d/(d*x+c)^3/
ln(F)^2-1/3*F^(a+b/(d*x+c)^3)/b/d/(d*x+c)^6/ln(F)
```

Rubi [A]
time = 0.09, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2243, 2240}

$$-\frac{2F^{a+\frac{b}{(c+dx)^3}}}{3b^3d\log^3(F)}+\frac{2F^{a+\frac{b}{(c+dx)^3}}}{3b^2d\log^2(F)(c+dx)^3}-\frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd\log(F)(c+dx)^6}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)/(c + d*x)^10,x]
```

```
[Out] (-2*F^(a + b/(c + d*x)^3))/(3*b^3*d*Log[F]^3) + (2*F^(a + b/(c + d*x)^3))/(
3*b^2*d*(c + d*x)^3*Log[F]^2) - F^(a + b/(c + d*x)^3)/(3*b*d*(c + d*x)^6*Lo
g[F])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^{10}}\,dx = -\frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd(c+dx)^6\log(F)} - \frac{2\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^7}\,dx}{b\log(F)}$$

$$= \frac{2F^{a+\frac{b}{(c+dx)^3}}}{3b^2d(c+dx)^3\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd(c+dx)^6\log(F)} + \frac{2\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^4}\,dx}{b^2\log^2(F)}$$

$$= -\frac{2F^{a+\frac{b}{(c+dx)^3}}}{3b^3d\log^3(F)} + \frac{2F^{a+\frac{b}{(c+dx)^3}}}{3b^2d(c+dx)^3\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd(c+dx)^6\log(F)}$$

Mathematica [A]
time = 0.03, size = 64, normalized size = 0.67

$$-\frac{F^{a+\frac{b}{(c+dx)^3}}\left(2(c+dx)^6 - 2b(c+dx)^3\log(F) + b^2\log^2(F)\right)}{3b^3d(c+dx)^6\log^3(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)/(c + d*x)^10,x]
```

```
[Out] -1/3*(F^(a + b/(c + d*x)^3)*(2*(c + d*x)^6 - 2*b*(c + d*x)^3*Log[F] + b^2*L
og[F]^2))/(b^3*d*(c + d*x)^6*Log[F]^3)
```

Maple [A]
time = 0.10, size = 175, normalized size = 1.82

method	result
risch	$-\frac{\left(2d^6x^6+12c\,d^5x^5+30c^2d^4x^4+40c^3d^3x^3-2\ln(F)b\,d^3x^3+30c^4d^2x^2-6\ln(F)bc\,d^2x^2+12c^5dx-6\ln(F)b\,c^2dx+2c^6-2\ln(F)b\,c^3+\ln(\right.}{3b^3\ln(F)^3d(dx+c)^6}$
norman	$\frac{-\frac{2d^8x^9\mathrm{e}^{\left(a+\frac{b}{(dx+c)^3}\right)\ln(F)}}{3\ln(F)^3b^3}-\frac{c^2\left(6c^6-4\ln(F)b\,c^3+\ln(F)^2b^2\right)x\,\mathrm{e}^{\left(a+\frac{b}{(dx+c)^3}\right)\ln(F)}}{b^3\ln(F)^3}-\frac{d^2\left(168c^6-40\ln(F)b\,c^3+\ln(F)^2b^2\right)x^3\mathrm{e}^{\left(a+\frac{b}{(dx+c)^3}\right)\ln}}{3\ln(F)^3b^3}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^3)/(d*x+c)^10,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*(2*d^6*x^6+12*c*d^5*x^5+30*c^2*d^4*x^4+40*c^3*d^3*x^3-2*ln(F)*b*d^3*x^
3+30*c^4*d^2*x^2-6*ln(F)*b*c*d^2*x^2+12*c^5*d*x-6*ln(F)*b*c^2*d*x+2*c^6-2*l
n(F)*b*c^3+ln(F)^2*b^2)/b^3/ln(F)^3/d/(d*x+c)^6*F^((a*d^3*x^3+3*a*c*d^2*x^2
+3*a*c^2*d*x+a*c^3+b)/(d*x+c)^3)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 300 vs. 2(90) = 180.

time = 0.29, size = 300, normalized size = 3.12

$$-\frac{\left(2\,F^{a}d^{6}x^{6}+12\,F^{a}cd^{5}x^{5}+30\,F^{a}c^{2}d^{4}x^{4}+2\,F^{a}c^{6}-2\,F^{a}bc^{3}\log\left(F\right)+F^{a}b^{2}\log\left(F\right)^{2}+2\left(20\,F^{a}c^{3}d^{3}-F^{a}bd^{3}\log\left(F\right)\right)x^{3}+6\left(5\,F^{a}c^{4}d^{2}-F^{a}bcd^{2}\log\left(F\right)\right)x^{2}+6\left(2\,F^{a}c^{5}d-F^{a}bc^{2}d\log\left(F\right)\right)x\right)F^{\frac{b}{d^{3}x^{3}+3\,cd^{2}x^{2}+3\,c^{2}dx+c^{3}}}}{3\left(b^{3}d^{7}x^{6}\log\left(F\right)^{3}+6\,b^{3}cd^{6}x^{5}\log\left(F\right)^{3}+15\,b^{3}c^{2}d^{5}x^{4}\log\left(F\right)^{3}+20\,b^{3}c^{3}d^{4}x^{3}\log\left(F\right)^{3}+15\,b^{3}c^{4}d^{3}x^{2}\log\left(F\right)^{3}+6\,b^{3}c^{5}d^{2}x\log\left(F\right)^{3}+b^{3}c^{6}d\log\left(F\right)^{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^10,x, algorithm="maxima")
```

```
[Out] -1/3*(2*F^a*d^6*x^6 + 12*F^a*c*d^5*x^5 + 30*F^a*c^2*d^4*x^4 + 2*F^a*c^6 - 2
*F^a*b*c^3*log(F) + F^a*b^2*log(F)^2 + 2*(20*F^a*c^3*d^3 - F^a*b*d^3*log(F)
)*x^3 + 6*(5*F^a*c^4*d^2 - F^a*b*c*d^2*log(F))*x^2 + 6*(2*F^a*c^5*d - F^a*b
*c^2*d*log(F))*x)*F^(b/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/(b^3*d^7*
x^6*log(F)^3 + 6*b^3*c*d^6*x^5*log(F)^3 + 15*b^3*c^2*d^5*x^4*log(F)^3 + 20*
b^3*c^3*d^4*x^3*log(F)^3 + 15*b^3*c^4*d^3*x^2*log(F)^3 + 6*b^3*c^5*d^2*x*lo
g(F)^3 + b^3*c^6*d*log(F)^3)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 265 vs. $2(90) = 180$.
time = 0.39, size = 265, normalized size = 2.76

$$-\frac{\left(2\,d^{6}x^{6}+12\,cd^{5}x^{5}+30\,c^{2}d^{4}x^{4}+40\,c^{3}d^{3}x^{3}+30\,c^{4}d^{2}x^{2}+12\,c^{5}dx+2\,c^{6}+b^{2}\log\left(F\right)^{2}-2\left(bd^{3}x^{3}+3\,bcd^{2}x^{2}+3\,bc^{2}dx+bc^{3}\right)\log\left(F\right)\right)F^{\frac{ad^{3}x^{3}+3\,acd^{2}x^{2}+3\,ac^{2}dx+ac^{3}+b}{d^{3}x^{3}+3\,cd^{2}x^{2}+3\,c^{2}dx+c^{3}}}}{3\left(b^{3}d^{7}x^{6}+6\,b^{3}cd^{6}x^{5}+15\,b^{3}c^{2}d^{5}x^{4}+20\,b^{3}c^{3}d^{4}x^{3}+15\,b^{3}c^{4}d^{3}x^{2}+6\,b^{3}c^{5}d^{2}x+b^{3}c^{6}d\right)\log\left(F\right)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^10,x, algorithm="fricas")
```

```
[Out] -1/3*(2*d^6*x^6 + 12*c*d^5*x^5 + 30*c^2*d^4*x^4 + 40*c^3*d^3*x^3 + 30*c^4*d
^2*x^2 + 12*c^5*d*x + 2*c^6 + b^2*log(F)^2 - 2*(b*d^3*x^3 + 3*b*c*d^2*x^2 +
 3*b*c^2*d*x + b*c^3)*log(F))*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 + 3*a*c^2*d*x +
 a*c^3 + b)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/((b^3*d^7*x^6 + 6*b^
3*c*d^6*x^5 + 15*b^3*c^2*d^5*x^4 + 20*b^3*c^3*d^4*x^3 + 15*b^3*c^4*d^3*x^2
+ 6*b^3*c^5*d^2*x + b^3*c^6*d)*log(F)^3)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 270 vs. $2(83) = 166$.
time = 0.22, size = 270, normalized size = 2.81

$$\frac{F^{a+\frac{b}{(c+dx)^{3}}}\left(-b^{2}\log\left(F\right)^{2}+2bc^{3}\log\left(F\right)+6bc^{2}dx\log\left(F\right)+6bcd^{2}x^{2}\log\left(F\right)+2bd^{3}x^{3}\log\left(F\right)-2c^{6}-12c^{5}dx-30c^{4}d^{2}x^{2}-40c^{3}d^{3}x^{3}-30c^{2}d^{4}x^{4}-12cd^{5}x^{5}-2d^{6}x^{6}\right)}{3b^{3}c^{6}d\log\left(F\right)^{3}+18b^{3}c^{5}d^{2}x\log\left(F\right)^{3}+45b^{3}c^{4}d^{3}x^{2}\log\left(F\right)^{3}+60b^{3}c^{3}d^{4}x^{3}\log\left(F\right)^{3}+45b^{3}c^{2}d^{5}x^{4}\log\left(F\right)^{3}+18b^{3}cd^{6}x^{5}\log\left(F\right)^{3}+3b^{3}d^{7}x^{6}\log\left(F\right)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)/(d*x+c)**10,x)
```

```
[Out] F**(a + b/(c + d*x)**3)*(-b**2*log(F)**2 + 2*b*c**3*log(F) + 6*b*c**2*d*x*l
og(F) + 6*b*c*d**2*x**2*log(F) + 2*b*d**3*x**3*log(F) - 2*c**6 - 12*c**5*d*
x - 30*c**4*d**2*x**2 - 40*c**3*d**3*x**3 - 30*c**2*d**4*x**4 - 12*c*d**5*x
**5 - 2*d**6*x**6)/(3*b**3*c**6*d*log(F)**3 + 18*b**3*c**5*d**2*x*log(F)**3
 + 45*b**3*c**4*d**3*x**2*log(F)**3 + 60*b**3*c**3*d**4*x**3*log(F)**3 + 45
```

```
*b**3*c**2*d**5*x**4*log(F)**3 + 18*b**3*c*d**6*x**5*log(F)**3 + 3*b**3*d**
7*x**6*log(F)**3)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^10,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c)^10, x)
```

Mupad [B]
time = 4.08, size = 263, normalized size = 2.74

$$-\frac{F^a\,F^{\frac{b}{c^3+3\,c^2\,d\,x+3\,c\,d^2\,x^2+d^3\,x^3}}\,\left(\frac{2\,x^6}{3\,b^3\,d\,{\ln\left(F\right)}^3}+\frac{b^2\,{\ln\left(F\right)}^2-2\,b\,c^3\,\ln\left(F\right)+2\,c^6}{3\,b^3\,d^7\,{\ln\left(F\right)}^3}+\frac{4\,c\,x^5}{b^3\,d^2\,{\ln\left(F\right)}^3}+\frac{10\,c^2\,x^4}{b^3\,d^3\,{\ln\left(F\right)}^3}-\frac{2\,x^3\,\left(b\,\ln\left(F\right)-20\,c^3\right)}{3\,b^3\,d^4\,{\ln\left(F\right)}^3}-\frac{2\,c^2\,x\,\left(b\,\ln\left(F\right)-2\,c^3\right)}{b^3\,d^6\,{\ln\left(F\right)}^3}-\frac{2\,c\,x^2\,\left(b\,\ln\left(F\right)-5\,c^3\right)}{b^3\,d^5\,{\ln\left(F\right)}^3}\right)}{x^6+\frac{c^6}{d^6}+\frac{6\,c\,x^5}{d}+\frac{6\,c^5\,x}{d^5}+\frac{15\,c^2\,x^4}{d^2}+\frac{20\,c^3\,x^3}{d^3}+\frac{15\,c^4\,x^2}{d^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)/(c + d*x)^10,x)
```

```
[Out] -(F^a*F^(b/(c^3 + d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x))*((2*x^6)/(3*b^3*d*log
(F)^3) + (b^2*log(F)^2 + 2*c^6 - 2*b*c^3*log(F))/(3*b^3*d^7*log(F)^3) + (4*
c*x^5)/(b^3*d^2*log(F)^3) + (10*c^2*x^4)/(b^3*d^3*log(F)^3) - (2*x^3*(b*log
(F) - 20*c^3))/(3*b^3*d^4*log(F)^3) - (2*c^2*x*(b*log(F) - 2*c^3))/(b^3*d^6
*log(F)^3) - (2*c*x^2*(b*log(F) - 5*c^3))/(b^3*d^5*log(F)^3)))/(x^6 + c^6/d
^6 + (6*c*x^5)/d + (6*c^5*x)/d^5 + (15*c^2*x^4)/d^2 + (20*c^3*x^3)/d^3 + (1
5*c^4*x^2)/d^4)
```

3.350 $\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^{13}}\,dx$

Optimal. Leaf size=123

$$\frac{2F^{a+\frac{b}{(c+dx)^3}}}{b^4d\log^4(F)}-\frac{2F^{a+\frac{b}{(c+dx)^3}}}{b^3d(c+dx)^3\log^3(F)}+\frac{F^{a+\frac{b}{(c+dx)^3}}}{b^2d(c+dx)^6\log^2(F)}-\frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd(c+dx)^9\log(F)}$$

```
[Out] 2*F^(a+b/(d*x+c)^3)/b^4/d/ln(F)^4-2*F^(a+b/(d*x+c)^3)/b^3/d/(d*x+c)^3/ln(F)
^3+F^(a+b/(d*x+c)^3)/b^2/d/(d*x+c)^6/ln(F)^2-1/3*F^(a+b/(d*x+c)^3)/b/d/(d*x
+c)^9/ln(F)
```

Rubi [A]
time = 0.13, antiderivative size = 123, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2243, 2240}

$$\frac{2F^{a+\frac{b}{(c+dx)^3}}}{b^4d\log^4(F)}-\frac{2F^{a+\frac{b}{(c+dx)^3}}}{b^3d\log^3(F)(c+dx)^3}+\frac{F^{a+\frac{b}{(c+dx)^3}}}{b^2d\log^2(F)(c+dx)^6}-\frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd\log(F)(c+dx)^9}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)/(c + d*x)^13,x]
```

```
[Out] (2*F^(a + b/(c + d*x)^3))/(b^4*d*Log[F]^4) - (2*F^(a + b/(c + d*x)^3))/(b^3
*d*(c + d*x)^3*Log[F]^3) + F^(a + b/(c + d*x)^3)/(b^2*d*(c + d*x)^6*Log[F]^
2) - F^(a + b/(c + d*x)^3)/(3*b*d*(c + d*x)^9*Log[F])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^{13}}\,dx = -\frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd(c+dx)^9\log(F)} - \frac{3\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^{10}}\,dx}{b\log(F)}$$

$$= \frac{F^{a+\frac{b}{(c+dx)^3}}}{b^2d(c+dx)^6\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd(c+dx)^9\log(F)} + \frac{6\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^7}\,dx}{b^2\log^2(F)}$$

$$= -\frac{2F^{a+\frac{b}{(c+dx)^3}}}{b^3d(c+dx)^3\log^3(F)} + \frac{F^{a+\frac{b}{(c+dx)^3}}}{b^2d(c+dx)^6\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd(c+dx)^9\log(F)} - \frac{6\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^4}\,d}{b^3\log^3(F)}$$

$$= \frac{2F^{a+\frac{b}{(c+dx)^3}}}{b^4d\log^4(F)} - \frac{2F^{a+\frac{b}{(c+dx)^3}}}{b^3d(c+dx)^3\log^3(F)} + \frac{F^{a+\frac{b}{(c+dx)^3}}}{b^2d(c+dx)^6\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd(c+dx)^9\log(F)}$$

Mathematica [A]
time = 0.02, size = 73, normalized size = 0.59

$$\frac{F^{a+\frac{b}{(c+dx)^3}}\left(6-\frac{6b\log(F)}{(c+dx)^3}+\frac{3b^2\log^2(F)}{(c+dx)^6}-\frac{b^3\log^3(F)}{(c+dx)^9}\right)}{3b^4d\log^4(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)/(c + d*x)^13,x]
```

```
[Out] (F^(a + b/(c + d*x)^3)*(6 - (6*b*Log[F])/(c + d*x)^3 + (3*b^2*Log[F]^2)/(c
+ d*x)^6 - (b^3*Log[F]^3)/(c + d*x)^9))/(3*b^4*d*Log[F]^4)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 306 vs. 2(121) = 242.
time = 0.14, size = 307, normalized size = 2.50

method	result
risch	$-\frac{\left(-6d^9x^9-54c\,d^8x^8-216c^2d^7x^7-504c^3d^6x^6+6\ln(F)b\,d^6x^6-756c^4d^5x^5+36\ln(F)bc\,d^5x^5-756c^5d^4x^4+90\ln(F)b\,c^2d^4x^4-504c^6d\right.}{}$
norman	$-\frac{\left(-6c^9+6\ln(F)b\,c^6-3\ln(F)^2b^2c^3+\ln(F)^3b^3\right)c^3\,\mathrm{e}^{\left(a+\frac{b}{(dx+c)^3}\right)\ln(F)}}{3b^4\ln(F)^4d}-\frac{c^2\left(-24c^9+18\ln(F)b\,c^6-6\ln(F)^2b^2c^3+\ln(F)^3b^3\right)x\,\mathrm{e}^{\left(a+\frac{b}{(dx+c)^3}\right)\ln(}}{b^4\ln(F)^4}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^3)/(d*x+c)^13,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*(-6*d^9*x^9-54*c*d^8*x^8-216*c^2*d^7*x^7-504*c^3*d^6*x^6+6*ln(F)*b*d^6
*x^6-756*c^4*d^5*x^5+36*ln(F)*b*c*d^5*x^5-756*c^5*d^4*x^4+90*ln(F)*b*c^2*d^
```

```
4*x^4-504*c^6*d^3*x^3+120*ln(F)*b*c^3*d^3*x^3-216*c^7*d^2*x^2-3*ln(F)^2*b^2
*d^3*x^3+90*ln(F)*b*c^4*d^2*x^2-54*c^8*d*x-9*ln(F)^2*b^2*c*d^2*x^2+36*ln(F)
*b*c^5*d*x-6*c^9-9*ln(F)^2*b^2*c^2*d*x+6*ln(F)*b*c^6-3*ln(F)^2*b^2*c^3+ln(F
)^3*b^3)/b^4/ln(F)^4/d/(d*x+c)^9*F^((a*d^3*x^3+3*a*c*d^2*x^2+3*a*c^2*d*x+a*
c^3+b)/(d*x+c)^3)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 507 vs. $2(121) = 242$.
time = 0.30, size = 507, normalized size = 4.12

$$\frac{\left(6\,F^{a} d^{9} x^{9} + 54\,F^{a} c d^{8} x^{8} + 216\,F^{a} c^{2} d^{7} x^{7} + 6\,F^{a} c^{9} - 6\,F^{a} b c^{6} \log\left(F\right) + 3\,F^{a} b^{2} c^{3} \log\left(F\right)^{2} + 6\,\left(84\,F^{a} c^{3} d^{6} - F^{a} b d^{6} \log\left(F\right)\right) x^{6} - F^{a} b^{3} \log\left(F\right)^{3} + 36\,\left(21\,F^{a} c^{4} d^{5} - F^{a} b c d^{5} \log\left(F\right)\right) x^{5} + 18\,\left(42\,F^{a} c^{5} d^{4} - 5\,F^{a} b c^{2} d^{4} \log\left(F\right)\right) x^{4} + 3\,\left(168\,F^{a} c^{6} d^{3} - 40\,F^{a} b c^{3} d^{3} \log\left(F\right) + F^{a} b^{2} d^{3} \log\left(F\right)^{2}\right) x^{3} + 9\,\left(24\,F^{a} c^{7} d^{2} - 10\,F^{a} b c^{4} d^{2} \log\left(F\right) + F^{a} b^{2} c d^{2} \log\left(F\right)^{2}\right) x^{2} + 9\,\left(6\,F^{a} c^{8} d - 4\,F^{a} b c^{5} d \log\left(F\right) + F^{a} b^{2} c^{2} d \log\left(F\right)^{2}\right) x\right) F^{\frac{b}{d^{3} x^{3} + 3\,c d^{2} x^{2} + 3\,c^{2} d x + c^{3}}}}{3\,\left(b^{4} d^{10} x^{9} \log\left(F\right)^{4} + 9\,b^{4} c d^{9} x^{8} \log\left(F\right)^{4} + 36\,b^{4} c^{2} d^{8} x^{7} \log\left(F\right)^{4} + 84\,b^{4} c^{3} d^{7} x^{6} \log\left(F\right)^{4} + 126\,b^{4} c^{4} d^{6} x^{5} \log\left(F\right)^{4} + 126\,b^{4} c^{5} d^{5} x^{4} \log\left(F\right)^{4} + 84\,b^{4} c^{6} d^{4} x^{3} \log\left(F\right)^{4} + 36\,b^{4} c^{7} d^{3} x^{2} \log\left(F\right)^{4} + 9\,b^{4} c^{8} d^{2} x \log\left(F\right)^{4} + b^{4} c^{9} d \log\left(F\right)^{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^13,x, algorithm="maxima")
```

```
[Out] 1/3*(6*F^a*d^9*x^9 + 54*F^a*c*d^8*x^8 + 216*F^a*c^2*d^7*x^7 + 6*F^a*c^9 - 6
*F^a*b*c^6*log(F) + 3*F^a*b^2*c^3*log(F)^2 + 6*(84*F^a*c^3*d^6 - F^a*b*d^6*
log(F))*x^6 - F^a*b^3*log(F)^3 + 36*(21*F^a*c^4*d^5 - F^a*b*c*d^5*log(F))*x
^5 + 18*(42*F^a*c^5*d^4 - 5*F^a*b*c^2*d^4*log(F))*x^4 + 3*(168*F^a*c^6*d^3
- 40*F^a*b*c^3*d^3*log(F) + F^a*b^2*d^3*log(F)^2)*x^3 + 9*(24*F^a*c^7*d^2 -
 10*F^a*b*c^4*d^2*log(F) + F^a*b^2*c*d^2*log(F)^2)*x^2 + 9*(6*F^a*c^8*d - 4
*F^a*b*c^5*d*log(F) + F^a*b^2*c^2*d*log(F)^2)*x)*F^(b/(d^3*x^3 + 3*c*d^2*x^
2 + 3*c^2*d*x + c^3))/(b^4*d^10*x^9*log(F)^4 + 9*b^4*c*d^9*x^8*log(F)^4 + 3
6*b^4*c^2*d^8*x^7*log(F)^4 + 84*b^4*c^3*d^7*x^6*log(F)^4 + 126*b^4*c^4*d^6*
x^5*log(F)^4 + 126*b^4*c^5*d^5*x^4*log(F)^4 + 84*b^4*c^6*d^4*x^3*log(F)^4 +
 36*b^4*c^7*d^3*x^2*log(F)^4 + 9*b^4*c^8*d^2*x*log(F)^4 + b^4*c^9*d*log(F)^
4)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 423 vs. $2(121) = 242$.
time = 0.40, size = 423, normalized size = 3.44

$$\frac{\left(6\,d^{9} x^{9} + 54\,c d^{8} x^{8} + 216\,c^{2} d^{7} x^{7} + 504\,c^{3} d^{6} x^{6} + 756\,c^{4} d^{5} x^{5} + 756\,c^{5} d^{4} x^{4} + 504\,c^{6} d^{3} x^{3} + 216\,c^{7} d^{2} x^{2} + 54\,c^{8} d x + 6\,c^{9} - b^{3} \log\left(F\right)^{3} + 3\,\left(b^{2} d^{3} x^{3} + 3\,b^{2} c d^{2} x^{2} + 3\,b^{2} c^{2} d x + b^{2} c^{3}\right) \log\left(F\right)^{2} - 6\,\left(b d^{6} x^{6} + 6\,b c d^{5} x^{5} + 15\,b c^{2} d^{4} x^{4} + 20\,b c^{3} d^{3} x^{3} + 15\,b c^{4} d^{2} x^{2} + 6\,b c^{5} d x + b c^{6}\right) \log\left(F\right)\right) F^{\frac{a d^{3} x^{3} + 3\,a c d^{2} x^{2} + 3\,a c^{2} d x + a c^{3} + b}{d^{3} x^{3} + 3\,c d^{2} x^{2} + 3\,c^{2} d x + c^{3}}}}{3\,\left(b^{4} d^{10} x^{9} + 9\,b^{4} c d^{9} x^{8} + 36\,b^{4} c^{2} d^{8} x^{7} + 84\,b^{4} c^{3} d^{7} x^{6} + 126\,b^{4} c^{4} d^{6} x^{5} + 126\,b^{4} c^{5} d^{5} x^{4} + 84\,b^{4} c^{6} d^{4} x^{3} + 36\,b^{4} c^{7} d^{3} x^{2} + 9\,b^{4} c^{8} d^{2} x + b^{4} c^{9} d\right)} \log\left(F\right)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^13,x, algorithm="fricas")
```

```
[Out] 1/3*(6*d^9*x^9 + 54*c*d^8*x^8 + 216*c^2*d^7*x^7 + 504*c^3*d^6*x^6 + 756*c^4
*d^5*x^5 + 756*c^5*d^4*x^4 + 504*c^6*d^3*x^3 + 216*c^7*d^2*x^2 + 54*c^8*d*x
 + 6*c^9 - b^3*log(F)^3 + 3*(b^2*d^3*x^3 + 3*b^2*c*d^2*x^2 + 3*b^2*c^2*d*x
+ b^2*c^3)*log(F)^2 - 6*(b*d^6*x^6 + 6*b*c*d^5*x^5 + 15*b*c^2*d^4*x^4 + 20*
b*c^3*d^3*x^3 + 15*b*c^4*d^2*x^2 + 6*b*c^5*d*x + b*c^6)*log(F))*F^((a*d^3*x
^3 + 3*a*c*d^2*x^2 + 3*a*c^2*d*x + a*c^3 + b)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^
2*d*x + c^3))/((b^4*d^10*x^9 + 9*b^4*c*d^9*x^8 + 36*b^4*c^2*d^8*x^7 + 84*b^
4*c^3*d^7*x^6 + 126*b^4*c^4*d^6*x^5 + 126*b^4*c^5*d^5*x^4 + 84*b^4*c^6*d^4*
x^3 + 36*b^4*c^7*d^3*x^2 + 9*b^4*c^8*d^2*x + b^4*c^9*d)*log(F)^4)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 484 vs. $2(109) = 218$.
time = 0.40, size = 484, normalized size = 3.93

$$\frac{F^{a+\frac{b}{(c+dx)^3}}\left(-b^3\log(F)^3+3b^2c^3\log(F)^2+9b^2c^2dx\log(F)^2+9b^2cd^2x^2\log(F)^2+3b^2d^3x^3\log(F)^2-6bc^6\log(F)-36bc^5dx\log(F)-90bc^4d^2x^2\log(F)-120bc^3d^3x^3\log(F)-90bc^2d^4x^4\log(F)-36bcd^5x^5\log(F)-6bd^6x^6\log(F)+6c^9+54c^8dx+216c^7d^2x^2+504c^6d^3x^3+756c^5d^4x^4+756c^4d^5x^5+504c^3d^6x^6+216c^2d^7x^7+54cd^8x^8+6d^9x^9\right)}{3b^4c^9d\log(F)^4+27b^4c^8d^2x\log(F)^4+108b^4c^7d^3x^2\log(F)^4+252b^4c^6d^4x^3\log(F)^4+378b^4c^5d^5x^4\log(F)^4+378b^4c^4d^6x^5\log(F)^4+252b^4c^3d^7x^6\log(F)^4+108b^4c^2d^8x^7\log(F)^4+27b^4cd^9x^8\log(F)^4+3b^4d^{10}x^9\log(F)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)/(d*x+c)**13,x)
```

```
[Out] F**(a + b/(c + d*x)**3)*(-b**3*log(F)**3 + 3*b**2*c**3*log(F)**2 + 9*b**2*c
**2*d*x*log(F)**2 + 9*b**2*c*d**2*x**2*log(F)**2 + 3*b**2*d**3*x**3*log(F)*
*2 - 6*b*c**6*log(F) - 36*b*c**5*d*x*log(F) - 90*b*c**4*d**2*x**2*log(F) -
120*b*c**3*d**3*x**3*log(F) - 90*b*c**2*d**4*x**4*log(F) - 36*b*c*d**5*x**5
*log(F) - 6*b*d**6*x**6*log(F) + 6*c**9 + 54*c**8*d*x + 216*c**7*d**2*x**2
+ 504*c**6*d**3*x**3 + 756*c**5*d**4*x**4 + 756*c**4*d**5*x**5 + 504*c**3*d
**6*x**6 + 216*c**2*d**7*x**7 + 54*c*d**8*x**8 + 6*d**9*x**9)/(3*b**4*c**9*
d*log(F)**4 + 27*b**4*c**8*d**2*x*log(F)**4 + 108*b**4*c**7*d**3*x**2*log(F
)**4 + 252*b**4*c**6*d**4*x**3*log(F)**4 + 378*b**4*c**5*d**5*x**4*log(F)**
4 + 378*b**4*c**4*d**6*x**5*log(F)**4 + 252*b**4*c**3*d**7*x**6*log(F)**4 +
 108*b**4*c**2*d**8*x**7*log(F)**4 + 27*b**4*c*d**9*x**8*log(F)**4 + 3*b**4
*d**10*x**9*log(F)**4)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^13,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c)^13, x)
```

Mupad [B]
time = 4.59, size = 422, normalized size = 3.43

$$\frac{F^a\,F^{\frac{b}{c^3+3\,c^2\,d\,x+3\,c\,d^2\,x^2+d^3\,x^3}}\,\left(\frac{2\,x^9}{b^4\,d\ln(F)^4}-\frac{b^3\ln(F)^3-3\,b^2\,c^3\ln(F)^2+6\,b\,c^6\,\ln(F)-6\,c^9}{3\,b^4\,d^{10}\ln(F)^4}+\frac{18\,c\,x^8}{b^4\,d^2\ln(F)^4}+\frac{72\,c^2\,x^7}{b^4\,d^3\ln(F)^4}+\frac{x^3\,\left(b^2\ln(F)^2-40\,b\,c^3\,\ln(F)+168\,c^6\right)}{b^4\,d^7\ln(F)^4}-\frac{2\,x^6\,\left(b\,\ln(F)-84\,c^3\right)}{b^4\,d^4\ln(F)^4}+\frac{3\,c^2\,x\,\left(b^2\ln(F)^2-4\,b\,c^3\,\ln(F)+6\,c^6\right)}{b^4\,d^9\ln(F)^4}+\frac{3\,c\,x^2\,\left(b^2\ln(F)^2-10\,b\,c^3\,\ln(F)+24\,c^6\right)}{b^4\,d^8\ln(F)^4}-\frac{12\,c\,x^5\,\left(b\,\ln(F)-21\,c^3\right)}{b^4\,d^5\ln(F)^4}-\frac{6\,c^2\,x^4\,\left(5\,b\,\ln(F)-42\,c^3\right)}{b^4\,d^6\ln(F)^4}\right)}{x^9+\frac{c^9}{d^9}+\frac{9\,c\,x^8}{d}+\frac{9\,c^8\,x}{d^8}+\frac{36\,c^2\,x^7}{d^2}+\frac{84\,c^3\,x^6}{d^3}+\frac{126\,c^4\,x^5}{d^4}+\frac{126\,c^5\,x^4}{d^5}+\frac{84\,c^6\,x^3}{d^6}+\frac{36\,c^7\,x^2}{d^7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)/(c + d*x)^13,x)
```

```
[Out] (F^a*F^(b/(c^3 + d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x))*((2*x^9)/(b^4*d*log(F)
^4) - (b^3*log(F)^3 - 6*c^9 + 6*b*c^6*log(F) - 3*b^2*c^3*log(F)^2)/(3*b^4*d
^10*log(F)^4) + (18*c*x^8)/(b^4*d^2*log(F)^4) + (72*c^2*x^7)/(b^4*d^3*log(F
)^4) + (x^3*(b^2*log(F)^2 + 168*c^6 - 40*b*c^3*log(F)))/(b^4*d^7*log(F)^4)
- (2*x^6*(b*log(F) - 84*c^3))/(b^4*d^4*log(F)^4) + (3*c^2*x*(b^2*log(F)^2 +
```

```
 6*c^6 - 4*b*c^3*log(F)))/(b^4*d^9*log(F)^4) + (3*c*x^2*(b^2*log(F)^2 + 24*
c^6 - 10*b*c^3*log(F)))/(b^4*d^8*log(F)^4) - (12*c*x^5*(b*log(F) - 21*c^3))
/(b^4*d^5*log(F)^4) - (6*c^2*x^4*(5*b*log(F) - 42*c^3))/(b^4*d^6*log(F)^4))
)/(x^9 + c^9/d^9 + (9*c*x^8)/d + (9*c^8*x)/d^8 + (36*c^2*x^7)/d^2 + (84*c^3
*x^6)/d^3 + (126*c^4*x^5)/d^4 + (126*c^5*x^4)/d^5 + (84*c^6*x^3)/d^6 + (36*
c^7*x^2)/d^7)
```

3.351 $\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^{16}} dx$

Optimal. Leaf size=96

$$-\frac{F^{a+\frac{b}{(c+dx)^3}}\left(24(c+dx)^{12}-24b(c+dx)^9\log(F)+12b^2(c+dx)^6\log^2(F)-4b^3(c+dx)^3\log^3(F)+b^4\log^4(F)\right)}{3b^5d(c+dx)^{12}\log^5(F)}$$

```
[Out] -1/3*F^(a+b/(d*x+c)^3)*(24*(d*x+c)^12-24*b*(d*x+c)^9*ln(F)+12*b^2*(d*x+c)^6
*ln(F)^2-4*b^3*(d*x+c)^3*ln(F)^3+b^4*ln(F)^4)/b^5/d/(d*x+c)^12/ln(F)^5
```

Rubi [A]
time = 0.06, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2249}

$$-\frac{F^{a+\frac{b}{(c+dx)^3}}\left(b^4\log^4(F)-4b^3\log^3(F)(c+dx)^3+12b^2\log^2(F)(c+dx)^6-24b\log(F)(c+dx)^9+24(c+dx)^{12}\right)}{3b^5d\log^5(F)(c+dx)^{12}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)/(c + d*x)^16,x]
```

```
[Out] -1/3*(F^(a + b/(c + d*x)^3)*(24*(c + d*x)^12 - 24*b*(c + d*x)^9*Log[F] + 12
*b^2*(c + d*x)^6*Log[F]^2 - 4*b^3*(c + d*x)^3*Log[F]^3 + b^4*Log[F]^4))/(b^
5*d*(c + d*x)^12*Log[F]^5)
```

Rule 2249

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> With[{p = Simplify[(m + 1)/n]}, Simp[(-F^a)*((f/d)^m/(d*n*
((-b)*Log[F])^p))*Simplify[FunctionExpand[Gamma[p, (-b)*(c + d*x)^n*Log[F]]
]], x] /; IGtQ[p, 0]] /; FreeQ[{F, a, b, c, d, e, f, m, n}, x] && EqQ[d*e -
 c*f, 0] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^{16}}\,dx = -\frac{F^a\Gamma\left(5,-\frac{b\log(F)}{(c+dx)^3}\right)}{3b^5d\log^5(F)}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

time = 0.01, size = 31, normalized size = 0.32

$$-\frac{F^a\Gamma\left(5,-\frac{b\log(F)}{(c+dx)^3}\right)}{3b^5d\log^5(F)}$$

Antiderivative was successfully verified.

[In] Integrate[F^(a + b/(c + d*x)^3)/(c + d*x)^16,x]

[Out] -1/3*(F^a*Gamma[5, -((b*Log[F])/(c + d*x)^3)])/(b^5*d*Log[F]^5)

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 492 vs. 2(94) = 188.
time = 0.22, size = 493, normalized size = 5.14

method	result
risch	$-\frac{\left(b^4\ln(F)^4+288c\,d^{11}x^{11}+1584c^2d^{10}x^{10}+5280c^3d^9x^9+11880c^4d^8x^8+19008c^5d^7x^7+22176c^6d^6x^6+19008c^7d^5x^5+11880c^8d^4x^4+52\right.}{}$
norman	Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a+b/(d*x+c)^3)/(d*x+c)^16,x,method=_RETURNVERBOSE)

[Out] -1/3*(b^4*ln(F)^4+288*c*d^11*x^11+1584*c^2*d^10*x^10+5280*c^3*d^9*x^9+11880*c^4*d^8*x^8+19008*c^5*d^7*x^7+22176*c^6*d^6*x^6+19008*c^7*d^5*x^5+11880*c^8*d^4*x^4+5280*c^9*d^3*x^3+1584*c^10*d^2*x^2+288*c^11*d*x+24*c^12-24*ln(F)*b*c^9-216*ln(F)*b*c*d^8*x^8-864*ln(F)*b*c^2*d^7*x^7-2016*ln(F)*b*c^3*d^6*x^6-3024*ln(F)*b*c^4*d^5*x^5-3024*ln(F)*b*c^5*d^4*x^4-2016*ln(F)*b*c^6*d^3*x^3-864*ln(F)*b*c^7*d^2*x^2-216*ln(F)*b*c^8*d*x-12*ln(F)^3*b^3*c*d^2*x^2-12*ln(F)^3*b^3*c^2*d*x+72*c*d^5*x^5*ln(F)^2*b^2+180*c^2*d^4*x^4*ln(F)^2*b^2+240*ln(F)^2*b^2*c^3*d^3*x^3+180*ln(F)^2*b^2*c^4*d^2*x^2+72*ln(F)^2*b^2*c^5*d*x-24*ln(F)*b*d^9*x^9-4*b^3*d^3*x^3*ln(F)^3+12*ln(F)^2*b^2*c^6-4*ln(F)^3*b^3*c^3+24*d^12*x^12+12*d^6*x^6*ln(F)^2*b^2)/b^5/ln(F)^5/d/(d*x+c)^12*F^((a*d^3*x^3+3*a*c*d^2*x^2+3*a*c^2*d*x+a*c^3+b)/(d*x+c)^3)

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 770 vs. 2(94) = 188.
time = 0.31, size = 770, normalized size = 8.02

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^16,x, algorithm="maxima")

[Out] -1/3*(24*F^a*d^12*x^12 + 288*F^a*c*d^11*x^11 + 1584*F^a*c^2*d^10*x^10 + 24*F^a*c^12 - 24*F^a*b*c^9*log(F) + 12*F^a*b^2*c^6*log(F)^2 + 24*(220*F^a*c^3*

```
d^9 - F^a*b*d^9*log(F))*x^9 - 4*F^a*b^3*c^3*log(F)^3 + 216*(55*F^a*c^4*d^8
- F^a*b*c*d^8*log(F))*x^8 + F^a*b^4*log(F)^4 + 864*(22*F^a*c^5*d^7 - F^a*b*
c^2*d^7*log(F))*x^7 + 12*(1848*F^a*c^6*d^6 - 168*F^a*b*c^3*d^6*log(F) + F^a
*b^2*d^6*log(F)^2)*x^6 + 72*(264*F^a*c^7*d^5 - 42*F^a*b*c^4*d^5*log(F) + F^
a*b^2*c*d^5*log(F)^2)*x^5 + 36*(330*F^a*c^8*d^4 - 84*F^a*b*c^5*d^4*log(F) +
 5*F^a*b^2*c^2*d^4*log(F)^2)*x^4 + 4*(1320*F^a*c^9*d^3 - 504*F^a*b*c^6*d^3*
log(F) + 60*F^a*b^2*c^3*d^3*log(F)^2 - F^a*b^3*d^3*log(F)^3)*x^3 + 12*(132*
F^a*c^10*d^2 - 72*F^a*b*c^7*d^2*log(F) + 15*F^a*b^2*c^4*d^2*log(F)^2 - F^a*
b^3*c*d^2*log(F)^3)*x^2 + 12*(24*F^a*c^11*d - 18*F^a*b*c^8*d*log(F) + 6*F^a
*b^2*c^5*d*log(F)^2 - F^a*b^3*c^2*d*log(F)^3)*x)*F^(b/(d^3*x^3 + 3*c*d^2*x^
2 + 3*c^2*d*x + c^3))/(b^5*d^13*x^12*log(F)^5 + 12*b^5*c*d^12*x^11*log(F)^5
 + 66*b^5*c^2*d^11*x^10*log(F)^5 + 220*b^5*c^3*d^10*x^9*log(F)^5 + 495*b^5*
c^4*d^9*x^8*log(F)^5 + 792*b^5*c^5*d^8*x^7*log(F)^5 + 924*b^5*c^6*d^7*x^6*l
og(F)^5 + 792*b^5*c^7*d^6*x^5*log(F)^5 + 495*b^5*c^8*d^5*x^4*log(F)^5 + 220
*b^5*c^9*d^4*x^3*log(F)^5 + 66*b^5*c^10*d^3*x^2*log(F)^5 + 12*b^5*c^11*d^2*
x*log(F)^5 + b^5*c^12*d*log(F)^5)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 621 vs. $2(94) = 188$.
time = 0.42, size = 621, normalized size = 6.47

$$-\frac{\left(24 d^{12} x^{12} + 288 c d^{11} x^{11} + 1584 c^{2} d^{10} x^{10} + 5280 c^{3} d^{9} x^{9} + 11880 c^{4} d^{8} x^{8} + 19008 c^{5} d^{7} x^{7} + 22176 c^{6} d^{6} x^{6} + 19008 c^{7} d^{5} x^{5} + 11880 c^{8} d^{4} x^{4} + 5280 c^{9} d^{3} x^{3} + 1584 c^{10} d^{2} x^{2} + 288 c^{11} d x + 24 c^{12} + b^{4} \log\left(F\right)^{4} - 4 \left(b^{3} d^{3} x^{3} + 3 b^{3} c d^{2} x^{2} + 3 b^{3} c^{2} d x + b^{3} c^{3}\right) \log\left(F\right)^{3} + 12 \left(b^{2} d^{6} x^{6} + 6 b^{2} c d^{5} x^{5} + 15 b^{2} c^{2} d^{4} x^{4} + 20 b^{2} c^{3} d^{3} x^{3} + 15 b^{2} c^{4} d^{2} x^{2} + 6 b^{2} c^{5} d x + b^{2} c^{6}\right) \log\left(F\right)^{2} - 24 \left(b d^{9} x^{9} + 9 b c d^{8} x^{8} + 36 b c^{2} d^{7} x^{7} + 84 b c^{3} d^{6} x^{6} + 126 b c^{4} d^{5} x^{5} + 126 b c^{5} d^{4} x^{4} + 84 b c^{6} d^{3} x^{3} + 36 b c^{7} d^{2} x^{2} + 9 b c^{8} d x + b c^{9}\right) \log\left(F\right)\right)} F^{\frac{a d^{3} x^{3} + 3 a c d^{2} x^{2} + 3 a c^{2} d x + a c^{3} + b}{d^{3} x^{3} + 3 c d^{2} x^{2} + 3 c^{2} d x + c^{3}}}}{3 \left(b^{5} d^{13} x^{12} + 12 b^{5} c d^{12} x^{11} + 66 b^{5} c^{2} d^{11} x^{10} + 220 b^{5} c^{3} d^{10} x^{9} + 495 b^{5} c^{4} d^{9} x^{8} + 792 b^{5} c^{5} d^{8} x^{7} + 924 b^{5} c^{6} d^{7} x^{6} + 792 b^{5} c^{7} d^{6} x^{5} + 495 b^{5} c^{8} d^{5} x^{4} + 220 b^{5} c^{9} d^{4} x^{3} + 66 b^{5} c^{10} d^{3} x^{2} + 12 b^{5} c^{11} d^{2} x + b^{5} c^{12} d\right)} \log\left(F\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^16,x, algorithm="fricas")
```

```
[Out] -1/3*(24*d^12*x^12 + 288*c*d^11*x^11 + 1584*c^2*d^10*x^10 + 5280*c^3*d^9*x^
9 + 11880*c^4*d^8*x^8 + 19008*c^5*d^7*x^7 + 22176*c^6*d^6*x^6 + 19008*c^7*d
^5*x^5 + 11880*c^8*d^4*x^4 + 5280*c^9*d^3*x^3 + 1584*c^10*d^2*x^2 + 288*c^1
1*d*x + 24*c^12 + b^4*log(F)^4 - 4*(b^3*d^3*x^3 + 3*b^3*c*d^2*x^2 + 3*b^3*c
^2*d*x + b^3*c^3)*log(F)^3 + 12*(b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2
*d^4*x^4 + 20*b^2*c^3*d^3*x^3 + 15*b^2*c^4*d^2*x^2 + 6*b^2*c^5*d*x + b^2*c^
6)*log(F)^2 - 24*(b*d^9*x^9 + 9*b*c*d^8*x^8 + 36*b*c^2*d^7*x^7 + 84*b*c^3*d
^6*x^6 + 126*b*c^4*d^5*x^5 + 126*b*c^5*d^4*x^4 + 84*b*c^6*d^3*x^3 + 36*b*c^
7*d^2*x^2 + 9*b*c^8*d*x + b*c^9)*log(F))*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 + 3*
a*c^2*d*x + a*c^3 + b)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/((b^5*d^1
3*x^12 + 12*b^5*c*d^12*x^11 + 66*b^5*c^2*d^11*x^10 + 220*b^5*c^3*d^10*x^9 +
 495*b^5*c^4*d^9*x^8 + 792*b^5*c^5*d^8*x^7 + 924*b^5*c^6*d^7*x^6 + 792*b^5*
c^7*d^6*x^5 + 495*b^5*c^8*d^5*x^4 + 220*b^5*c^9*d^4*x^3 + 66*b^5*c^10*d^3*x
^2 + 12*b^5*c^11*d^2*x + b^5*c^12*d)*log(F)^5)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 760 vs. $2(95) = 190$.
time = 3.78, size = 760, normalized size = 7.92

$$\frac{F^{a + \frac{b}{\left(c + d x\right)^{3}}} \left(- b^{4} \log\left(F\right)^{4} + 4 b^{3} c^{3} \log\left(F\right)^{3} + 12 b^{3} c^{2} d x \log\left(F\right)^{3} + 12 b^{3} c d^{2} x^{2} \log\left(F\right)^{3} + 4 b^{3} d^{3} x^{3} \log\left(F\right)^{3} - 12 b^{2} c^{6} \log\left(F\right)^{2} - 72 b^{2} c^{5} d x \log\left(F\right)^{2} - 180 b^{2} c^{4} d^{2} x^{2} \log\left(F\right)^{2} - 240 b^{2} c^{3} d^{3} x^{3} \log\left(F\right)^{2} - 180 b^{2} c^{2} d^{4} x^{4} \log\left(F\right)^{2} - 72 b^{2} c d^{5} x^{5} \log\left(F\right)^{2} - 12 b^{2} d^{6} x^{6} \log\left(F\right)^{2} + 24 b c^{9} \log\left(F\right) + 216 b c^{8} d x \log\left(F\right) + 864 b c^{7} d^{2} x^{2} \log\left(F\right) + 2016 b c^{6} d^{3} x^{3} \log\left(F\right) + 3024 b c^{5} d^{4} x^{4} \log\left(F\right) + 3024 b c^{4} d^{5} x^{5} \log\left(F\right) + 2016 b c^{3} d^{6} x^{6} \log\left(F\right) + 864 b c^{2} d^{7} x^{7} \log\left(F\right) + 216 b c d^{8} x^{8} \log\left(F\right) + 24 b d^{9} x^{9} \log\left(F\right) - 24 c^{12} - 288 c^{11} d x - 1584 c^{10} d^{2} x^{2} - 5280 c^{9} d^{3} x^{3} - 11880 c^{8} d^{4} x^{4} - 19008 c^{7} d^{5} x^{5} - 22176 c^{6} d^{6} x^{6} - 19008 c^{5} d^{7} x^{7} - 11880 c^{4} d^{8} x^{8} - 5280 c^{3} d^{9} x^{9} - 1584 c^{2} d^{10} x^{10} - 288 c d^{11} x^{11} - 24 d^{12} x^{12}\right)}{3 b^{5} c^{12} d \log\left(F\right)^{5} + 36 b^{5} c^{11} d^{2} x \log\left(F\right)^{5} + 198 b^{5} c^{10} d^{3} x^{2} \log\left(F\right)^{5} + 660 b^{5} c^{9} d^{4} x^{3} \log\left(F\right)^{5} + 1485 b^{5} c^{8} d^{5} x^{4} \log\left(F\right)^{5} + 2376 b^{5} c^{7} d^{6} x^{5} \log\left(F\right)^{5} + 2772 b^{5} c^{6} d^{7} x^{6} \log\left(F\right)^{5} + 2376 b^{5} c^{5} d^{8} x^{7} \log\left(F\right)^{5} + 1485 b^{5} c^{4} d^{9} x^{8} \log\left(F\right)^{5} + 660 b^{5} c^{3} d^{10} x^{9} \log\left(F\right)^{5} + 198 b^{5} c^{2} d^{11} x^{10} \log\left(F\right)^{5} + 36 b^{5} c d^{12} x^{11} \log\left(F\right)^{5} + 3 b^{5} d^{13} x^{12} \log\left(F\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)/(d*x+c)**16,x)
```

```
[Out] F**(a + b/(c + d*x)**3)*(-b**4*log(F)**4 + 4*b**3*c**3*log(F)**3 + 12*b**3*
c**2*d*x*log(F)**3 + 12*b**3*c*d**2*x**2*log(F)**3 + 4*b**3*d**3*x**3*log(F
)**3 - 12*b**2*c**6*log(F)**2 - 72*b**2*c**5*d*x*log(F)**2 - 180*b**2*c**4*
d**2*x**2*log(F)**2 - 240*b**2*c**3*d**3*x**3*log(F)**2 - 180*b**2*c**2*d**
4*x**4*log(F)**2 - 72*b**2*c*d**5*x**5*log(F)**2 - 12*b**2*d**6*x**6*log(F)
**2 + 24*b*c**9*log(F) + 216*b*c**8*d*x*log(F) + 864*b*c**7*d**2*x**2*log(F
) + 2016*b*c**6*d**3*x**3*log(F) + 3024*b*c**5*d**4*x**4*log(F) + 3024*b*c*
*4*d**5*x**5*log(F) + 2016*b*c**3*d**6*x**6*log(F) + 864*b*c**2*d**7*x**7*l
og(F) + 216*b*c*d**8*x**8*log(F) + 24*b*d**9*x**9*log(F) - 24*c**12 - 288*c
**11*d*x - 1584*c**10*d**2*x**2 - 5280*c**9*d**3*x**3 - 11880*c**8*d**4*x**
4 - 19008*c**7*d**5*x**5 - 22176*c**6*d**6*x**6 - 19008*c**5*d**7*x**7 - 11
880*c**4*d**8*x**8 - 5280*c**3*d**9*x**9 - 1584*c**2*d**10*x**10 - 288*c*d*
*11*x**11 - 24*d**12*x**12)/(3*b**5*c**12*d*log(F)**5 + 36*b**5*c**11*d**2*
x*log(F)**5 + 198*b**5*c**10*d**3*x**2*log(F)**5 + 660*b**5*c**9*d**4*x**3*
log(F)**5 + 1485*b**5*c**8*d**5*x**4*log(F)**5 + 2376*b**5*c**7*d**6*x**5*l
og(F)**5 + 2772*b**5*c**6*d**7*x**6*log(F)**5 + 2376*b**5*c**5*d**8*x**7*lo
g(F)**5 + 1485*b**5*c**4*d**9*x**8*log(F)**5 + 660*b**5*c**3*d**10*x**9*log
(F)**5 + 198*b**5*c**2*d**11*x**10*log(F)**5 + 36*b**5*c*d**12*x**11*log(F)
**5 + 3*b**5*d**13*x**12*log(F)**5)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^16,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c)^16, x)
```

Mupad [B]
time = 5.15, size = 620, normalized size = 6.46

$$-\frac{F^a\,F^{\frac{b}{c^3+3\,c^2\,d\,x+3\,c\,d^2\,x^2+d^3\,x^3}}\,\left(\frac{b^4\,\ln(F)^4-4\,b^3\,c^3\,\ln(F)^3+12\,b^2\,c^6\,\ln(F)^2-24\,b\,c^9\,\ln(F)+24\,c^{12}}{3\,b^5\,d^{13}\,\ln(F)^5}+\frac{8\,x^{12}}{b^5\,d\,\ln(F)^5}+\frac{96\,c\,x^{11}}{b^5\,d^2\,\ln(F)^5}+\frac{528\,c^2\,x^{10}}{b^5\,d^3\,\ln(F)^5}-\frac{4\,x^3\,\left(b^3\,\ln(F)^3-60\,b^2\,c^3\,\ln(F)^2+504\,b\,c^6\,\ln(F)-1320\,c^9\right)}{3\,b^5\,d^{10}\,\ln(F)^5}+\frac{4\,x^6\,\left(b^2\,\ln(F)^2-168\,b\,c^3\,\ln(F)+1848\,c^6\right)}{b^5\,d^7\,\ln(F)^5}-\frac{8\,x^9\,\left(b\,\ln(F)-220\,c^3\right)}{b^5\,d^4\,\ln(F)^5}-\frac{4\,c^2\,x\,\left(b^3\,\ln(F)^3-6\,b^2\,c^3\,\ln(F)^2+18\,b\,c^6\,\ln(F)-24\,c^9\right)}{b^5\,d^{12}\,\ln(F)^5}-\frac{4\,c\,x^2\,\left(b^3\,\ln(F)^3-15\,b^2\,c^3\,\ln(F)^2+72\,b\,c^6\,\ln(F)-132\,c^9\right)}{b^5\,d^{11}\,\ln(F)^5}+\frac{24\,c\,x^5\,\left(b^2\,\ln(F)^2-42\,b\,c^3\,\ln(F)+264\,c^6\right)}{b^5\,d^8\,\ln(F)^5}-\frac{72\,c\,x^8\,\left(b\,\ln(F)-55\,c^3\right)}{b^5\,d^5\,\ln(F)^5}+\frac{12\,c^2\,x^4\,\left(5\,b^2\,\ln(F)^2-84\,b\,c^3\,\ln(F)+330\,c^6\right)}{b^5\,d^9\,\ln(F)^5}-\frac{288\,c^2\,x^7\,\left(b\,\ln(F)-22\,c^3\right)}{b^5\,d^6\,\ln(F)^5}\right)}{x^{12}+\frac{c^{12}}{d^{12}}+\frac{12\,c\,x^{11}}{d}+\frac{12\,c^{11}\,x}{d^{11}}+\frac{66\,c^2\,x^{10}}{d^2}+\frac{220\,c^3\,x^9}{d^3}+\frac{495\,c^4\,x^8}{d^4}+\frac{792\,c^5\,x^7}{d^5}+\frac{924\,c^6\,x^6}{d^6}+\frac{792\,c^7\,x^5}{d^7}+\frac{495\,c^8\,x^4}{d^8}+\frac{220\,c^9\,x^3}{d^9}+\frac{66\,c^{10}\,x^2}{d^{10}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)/(c + d*x)^16,x)
```

```
[Out] -(F^a*F^(b/(c^3 + d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x))*((b^4*log(F)^4 + 24*c
^12 - 24*b*c^9*log(F) - 4*b^3*c^3*log(F)^3 + 12*b^2*c^6*log(F)^2)/(3*b^5*d^
13*log(F)^5) + (8*x^12)/(b^5*d*log(F)^5) + (96*c*x^11)/(b^5*d^2*log(F)^5) +
 (528*c^2*x^10)/(b^5*d^3*log(F)^5) - (4*x^3*(b^3*log(F)^3 - 1320*c^9 + 504*
```

```
b*c^6*log(F) - 60*b^2*c^3*log(F)^2))/(3*b^5*d^10*log(F)^5) + (4*x^6*(b^2*lo
g(F)^2 + 1848*c^6 - 168*b*c^3*log(F)))/(b^5*d^7*log(F)^5) - (8*x^9*(b*log(F
) - 220*c^3))/(b^5*d^4*log(F)^5) - (4*c^2*x*(b^3*log(F)^3 - 24*c^9 + 18*b*c
^6*log(F) - 6*b^2*c^3*log(F)^2))/(b^5*d^12*log(F)^5) - (4*c*x^2*(b^3*log(F)
^3 - 132*c^9 + 72*b*c^6*log(F) - 15*b^2*c^3*log(F)^2))/(b^5*d^11*log(F)^5)
+ (24*c*x^5*(b^2*log(F)^2 + 264*c^6 - 42*b*c^3*log(F)))/(b^5*d^8*log(F)^5)
- (72*c*x^8*(b*log(F) - 55*c^3))/(b^5*d^5*log(F)^5) + (12*c^2*x^4*(5*b^2*lo
g(F)^2 + 330*c^6 - 84*b*c^3*log(F)))/(b^5*d^9*log(F)^5) - (288*c^2*x^7*(b*l
og(F) - 22*c^3))/(b^5*d^6*log(F)^5)))/(x^12 + c^12/d^12 + (12*c*x^11)/d + (
12*c^11*x)/d^11 + (66*c^2*x^10)/d^2 + (220*c^3*x^9)/d^3 + (495*c^4*x^8)/d^4
 + (792*c^5*x^7)/d^5 + (924*c^6*x^6)/d^6 + (792*c^7*x^5)/d^7 + (495*c^8*x^4
)/d^8 + (220*c^9*x^3)/d^9 + (66*c^10*x^2)/d^10)
```

3.352 $\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^{19}}\,dx$

Optimal. Leaf size=113

$$\frac{F^{a+\frac{b}{(c+dx)^3}}\left(120(c+dx)^{15}-120b(c+dx)^{12}\log(F)+60b^2(c+dx)^9\log^2(F)-20b^3(c+dx)^6\log^3(F)+5b^4(c+\right.}{3b^6d(c+dx)^{15}\log^6(F)}$$

```
[Out] 1/3*F^(a+b/(d*x+c)^3)*(120*(d*x+c)^15-120*b*(d*x+c)^12*ln(F)+60*b^2*(d*x+c)
^9*ln(F)^2-20*b^3*(d*x+c)^6*ln(F)^3+5*b^4*(d*x+c)^3*ln(F)^4-b^5*ln(F)^5)/b^
6/d/(d*x+c)^15/ln(F)^6
```

Rubi [A]
time = 0.07, antiderivative size = 113, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2249}

$$\frac{F^{a+\frac{b}{(c+dx)^3}}\left(-b^5\log^5(F)+5b^4\log^4(F)(c+dx)^3-20b^3\log^3(F)(c+dx)^6+60b^2\log^2(F)(c+dx)^9-120b\log(F)(c+dx)^{12}+120(c+dx)^{15}\right)}{3b^6d\log^6(F)(c+dx)^{15}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)/(c + d*x)^19,x]
```

```
[Out] (F^(a + b/(c + d*x)^3)*(120*(c + d*x)^15 - 120*b*(c + d*x)^12*Log[F] + 60*b
^2*(c + d*x)^9*Log[F]^2 - 20*b^3*(c + d*x)^6*Log[F]^3 + 5*b^4*(c + d*x)^3*L
og[F]^4 - b^5*Log[F]^5))/(3*b^6*d*(c + d*x)^15*Log[F]^6)
```

Rule 2249

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> With[{p = Simplify[(m + 1)/n]}, Simp[(-F^a)*((f/d)^m/(d*n*
((-b)*Log[F])^p))*Simplify[FunctionExpand[Gamma[p, (-b)*(c + d*x)^n*Log[F]]
]], x] /; IGtQ[p, 0]] /; FreeQ[{F, a, b, c, d, e, f, m, n}, x] && EqQ[d*e -
 c*f, 0] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^{19}}\,dx=\frac{F^a\Gamma\left(6,-\frac{b\log(F)}{(c+dx)^3}\right)}{3b^6d\log^6(F)}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

time = 0.01, size = 31, normalized size = 0.27

$$\frac{F^a \Gamma\left(6, -\frac{b \log(F)}{(c+dx)^3}\right)}{3b^6 d \log^6(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)/(c + d*x)^19,x]
```

```
[Out] (F^a*Gamma[6, -((b*Log[F])/(c + d*x)^3)])/(3*b^6*d*Log[F]^6)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 732 vs. 2(111) = 222.
time = 0.11, size = 733, normalized size = 6.49

method	result
risch	$-\frac{\left(b^5 \ln(F)^5-120c^{15}-5040\ln(F)^2 b^2 c^3 d^6 x^6+95040\ln(F) b c^7 d^5 x^5-7560\ln(F)^2 b^2 c^4 d^5 x^5+59400\ln(F) b c^8 d^4 x^4-7560\ln(F)^2 b^2 c^5 d^4\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^3)/(d*x+c)^19,x,method=_RETURNVERBOSE)
```

```
[Out] -1/3*(b^5*ln(F)^5-120*c^15-5040*ln(F)^2*b^2*c^3*d^6*x^6+95040*ln(F)*b*c^7*d
^5*x^5-7560*ln(F)^2*b^2*c^4*d^5*x^5+59400*ln(F)*b*c^8*d^4*x^4-7560*ln(F)^2*
b^2*c^5*d^4*x^4+26400*ln(F)*b*c^9*d^3*x^3-5040*ln(F)^2*b^2*c^6*d^3*x^3+7920
*ln(F)*b*c^10*d^2*x^2-2160*ln(F)^2*b^2*c^7*d^2*x^2+1440*ln(F)*b*c^11*d*x-54
0*ln(F)^2*b^2*c^8*d*x-15*ln(F)^4*b^4*c*d^2*x^2-15*ln(F)^4*b^4*c^2*d*x+1440*
ln(F)*b*c*d^11*x^11+7920*ln(F)*b*c^2*d^10*x^10+26400*ln(F)*b*c^3*d^9*x^9+59
400*ln(F)*b*c^4*d^8*x^8-540*ln(F)^2*b^2*c*d^8*x^8+95040*ln(F)*b*c^5*d^7*x^7
-2160*ln(F)^2*b^2*c^2*d^7*x^7+110880*ln(F)*b*c^6*d^6*x^6+120*c*d^5*x^5*b^3*
ln(F)^3+300*ln(F)^3*b^3*c^2*d^4*x^4+400*ln(F)^3*b^3*c^3*d^3*x^3+300*ln(F)^3
*b^3*c^4*d^2*x^2+120*ln(F)^3*b^3*c^5*d*x+20*ln(F)^3*b^3*c^6-120*d^15*x^15-1
800*c*d^14*x^14-12600*c^2*d^13*x^13-54600*c^3*d^12*x^12-163800*c^4*d^11*x^1
1-360360*c^5*d^10*x^10-600600*c^6*d^9*x^9-772200*c^7*d^8*x^8-772200*c^8*d^7
*x^7-600600*c^9*d^6*x^6-360360*c^10*d^5*x^5-163800*c^11*d^4*x^4-54600*c^12*
d^3*x^3-12600*c^13*d^2*x^2-1800*c^14*d*x+120*ln(F)*b*c^12-60*ln(F)^2*b^2*c^
9-5*ln(F)^4*b^4*c^3+120*ln(F)*b*d^12*x^12-60*ln(F)^2*b^2*d^9*x^9-5*ln(F)^4*
b^4*d^3*x^3+20*d^6*x^6*b^3*ln(F)^3)/ln(F)^6/b^6/d/(d*x+c)^15*F^((a*d^3*x^3+
3*a*c*d^2*x^2+3*a*c^2*d*x+a*c^3+b)/(d*x+c)^3)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 1085 vs. 2(111) = 222.
time = 0.32, size = 1085, normalized size = 9.60

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^19,x, algorithm="maxima")
```

```
[Out] 1/3*(120*F^a*d^15*x^15 + 1800*F^a*c*d^14*x^14 + 12600*F^a*c^2*d^13*x^13 + 1
20*F^a*c^15 - 120*F^a*b*c^12*log(F) + 60*F^a*b^2*c^9*log(F)^2 + 120*(455*F^
a*c^3*d^12 - F^a*b*d^12*log(F))*x^12 - 20*F^a*b^3*c^6*log(F)^3 + 360*(455*F
^a*c^4*d^11 - 4*F^a*b*c*d^11*log(F))*x^11 + 5*F^a*b^4*c^3*log(F)^4 + 3960*(
91*F^a*c^5*d^10 - 2*F^a*b*c^2*d^10*log(F))*x^10 - F^a*b^5*log(F)^5 + 60*(10
010*F^a*c^6*d^9 - 440*F^a*b*c^3*d^9*log(F) + F^a*b^2*d^9*log(F)^2)*x^9 + 54
0*(1430*F^a*c^7*d^8 - 110*F^a*b*c^4*d^8*log(F) + F^a*b^2*c*d^8*log(F)^2)*x^
8 + 1080*(715*F^a*c^8*d^7 - 88*F^a*b*c^5*d^7*log(F) + 2*F^a*b^2*c^2*d^7*log
(F)^2)*x^7 + 20*(30030*F^a*c^9*d^6 - 5544*F^a*b*c^6*d^6*log(F) + 252*F^a*b^
2*c^3*d^6*log(F)^2 - F^a*b^3*d^6*log(F)^3)*x^6 + 120*(3003*F^a*c^10*d^5 - 7
92*F^a*b*c^7*d^5*log(F) + 63*F^a*b^2*c^4*d^5*log(F)^2 - F^a*b^3*c*d^5*log(F
)^3)*x^5 + 60*(2730*F^a*c^11*d^4 - 990*F^a*b*c^8*d^4*log(F) + 126*F^a*b^2*c
^5*d^4*log(F)^2 - 5*F^a*b^3*c^2*d^4*log(F)^3)*x^4 + 5*(10920*F^a*c^12*d^3 -
 5280*F^a*b*c^9*d^3*log(F) + 1008*F^a*b^2*c^6*d^3*log(F)^2 - 80*F^a*b^3*c^3
*d^3*log(F)^3 + F^a*b^4*d^3*log(F)^4)*x^3 + 15*(840*F^a*c^13*d^2 - 528*F^a*
b*c^10*d^2*log(F) + 144*F^a*b^2*c^7*d^2*log(F)^2 - 20*F^a*b^3*c^4*d^2*log(F
)^3 + F^a*b^4*c*d^2*log(F)^4)*x^2 + 15*(120*F^a*c^14*d - 96*F^a*b*c^11*d*lo
g(F) + 36*F^a*b^2*c^8*d*log(F)^2 - 8*F^a*b^3*c^5*d*log(F)^3 + F^a*b^4*c^2*d
*log(F)^4)*x)*F^(b/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/(b^6*d^16*x^1
5*log(F)^6 + 15*b^6*c*d^15*x^14*log(F)^6 + 105*b^6*c^2*d^14*x^13*log(F)^6 +
 455*b^6*c^3*d^13*x^12*log(F)^6 + 1365*b^6*c^4*d^12*x^11*log(F)^6 + 3003*b^
6*c^5*d^11*x^10*log(F)^6 + 5005*b^6*c^6*d^10*x^9*log(F)^6 + 6435*b^6*c^7*d^
9*x^8*log(F)^6 + 6435*b^6*c^8*d^8*x^7*log(F)^6 + 5005*b^6*c^9*d^7*x^6*log(F
)^6 + 3003*b^6*c^10*d^6*x^5*log(F)^6 + 1365*b^6*c^11*d^5*x^4*log(F)^6 + 455
*b^6*c^12*d^4*x^3*log(F)^6 + 105*b^6*c^13*d^3*x^2*log(F)^6 + 15*b^6*c^14*d^
2*x*log(F)^6 + b^6*c^15*d*log(F)^6)
```

Fricas [**B**] Leaf count of result is larger than twice the leaf count of optimal. 863 vs. $2(111) = 222$.
time = 0.44, size = 863, normalized size = 7.64

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^19,x, algorithm="fricas")
```

```
[Out] 1/3*(120*d^15*x^15 + 1800*c*d^14*x^14 + 12600*c^2*d^13*x^13 + 54600*c^3*d^1
2*x^12 + 163800*c^4*d^11*x^11 + 360360*c^5*d^10*x^10 + 600600*c^6*d^9*x^9 +
 772200*c^7*d^8*x^8 + 772200*c^8*d^7*x^7 + 600600*c^9*d^6*x^6 + 360360*c^10
*d^5*x^5 + 163800*c^11*d^4*x^4 + 54600*c^12*d^3*x^3 + 12600*c^13*d^2*x^2 +
1800*c^14*d*x + 120*c^15 - b^5*log(F)^5 + 5*(b^4*d^3*x^3 + 3*b^4*c*d^2*x^2
+ 3*b^4*c^2*d*x + b^4*c^3)*log(F)^4 - 20*(b^3*d^6*x^6 + 6*b^3*c*d^5*x^5 + 1
```

```
5*b^3*c^2*d^4*x^4 + 20*b^3*c^3*d^3*x^3 + 15*b^3*c^4*d^2*x^2 + 6*b^3*c^5*d*x
 + b^3*c^6)*log(F)^3 + 60*(b^2*d^9*x^9 + 9*b^2*c*d^8*x^8 + 36*b^2*c^2*d^7*x
^7 + 84*b^2*c^3*d^6*x^6 + 126*b^2*c^4*d^5*x^5 + 126*b^2*c^5*d^4*x^4 + 84*b^
2*c^6*d^3*x^3 + 36*b^2*c^7*d^2*x^2 + 9*b^2*c^8*d*x + b^2*c^9)*log(F)^2 - 12
0*(b*d^12*x^12 + 12*b*c*d^11*x^11 + 66*b*c^2*d^10*x^10 + 220*b*c^3*d^9*x^9
+ 495*b*c^4*d^8*x^8 + 792*b*c^5*d^7*x^7 + 924*b*c^6*d^6*x^6 + 792*b*c^7*d^5
*x^5 + 495*b*c^8*d^4*x^4 + 220*b*c^9*d^3*x^3 + 66*b*c^10*d^2*x^2 + 12*b*c^1
1*d*x + b*c^12)*log(F))*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 + 3*a*c^2*d*x + a*c^3
 + b)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/((b^6*d^16*x^15 + 15*b^6*c
*d^15*x^14 + 105*b^6*c^2*d^14*x^13 + 455*b^6*c^3*d^13*x^12 + 1365*b^6*c^4*d
^12*x^11 + 3003*b^6*c^5*d^11*x^10 + 5005*b^6*c^6*d^10*x^9 + 6435*b^6*c^7*d^
9*x^8 + 6435*b^6*c^8*d^8*x^7 + 5005*b^6*c^9*d^7*x^6 + 3003*b^6*c^10*d^6*x^5
 + 1365*b^6*c^11*d^5*x^4 + 455*b^6*c^12*d^4*x^3 + 105*b^6*c^13*d^3*x^2 + 15
*b^6*c^14*d^2*x + b^6*c^15*d)*log(F)^6)
```

Sympy [**B**] Leaf count of result is larger than twice the leaf count of optimal. 1096 vs. $2(110) = 220$.
time = 50.03, size = 1096, normalized size = 9.70

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)/(d*x+c)**19,x)
```

```
[Out] F**(a + b/(c + d*x)**3)*(-b**5*log(F)**5 + 5*b**4*c**3*log(F)**4 + 15*b**4*
c**2*d*x*log(F)**4 + 15*b**4*c*d**2*x**2*log(F)**4 + 5*b**4*d**3*x**3*log(F
)**4 - 20*b**3*c**6*log(F)**3 - 120*b**3*c**5*d*x*log(F)**3 - 300*b**3*c**4
*d**2*x**2*log(F)**3 - 400*b**3*c**3*d**3*x**3*log(F)**3 - 300*b**3*c**2*d*
*4*x**4*log(F)**3 - 120*b**3*c*d**5*x**5*log(F)**3 - 20*b**3*d**6*x**6*log(
F)**3 + 60*b**2*c**9*log(F)**2 + 540*b**2*c**8*d*x*log(F)**2 + 2160*b**2*c*
*7*d**2*x**2*log(F)**2 + 5040*b**2*c**6*d**3*x**3*log(F)**2 + 7560*b**2*c**
5*d**4*x**4*log(F)**2 + 7560*b**2*c**4*d**5*x**5*log(F)**2 + 5040*b**2*c**3
*d**6*x**6*log(F)**2 + 2160*b**2*c**2*d**7*x**7*log(F)**2 + 540*b**2*c*d**8
*x**8*log(F)**2 + 60*b**2*d**9*x**9*log(F)**2 - 120*b*c**12*log(F) - 1440*b
*c**11*d*x*log(F) - 7920*b*c**10*d**2*x**2*log(F) - 26400*b*c**9*d**3*x**3*
log(F) - 59400*b*c**8*d**4*x**4*log(F) - 95040*b*c**7*d**5*x**5*log(F) - 11
0880*b*c**6*d**6*x**6*log(F) - 95040*b*c**5*d**7*x**7*log(F) - 59400*b*c**4
*d**8*x**8*log(F) - 26400*b*c**3*d**9*x**9*log(F) - 7920*b*c**2*d**10*x**10
*log(F) - 1440*b*c*d**11*x**11*log(F) - 120*b*d**12*x**12*log(F) + 120*c**1
5 + 1800*c**14*d*x + 12600*c**13*d**2*x**2 + 54600*c**12*d**3*x**3 + 163800
*c**11*d**4*x**4 + 360360*c**10*d**5*x**5 + 600600*c**9*d**6*x**6 + 772200*
c**8*d**7*x**7 + 772200*c**7*d**8*x**8 + 600600*c**6*d**9*x**9 + 360360*c**
5*d**10*x**10 + 163800*c**4*d**11*x**11 + 54600*c**3*d**12*x**12 + 12600*c*
*2*d**13*x**13 + 1800*c*d**14*x**14 + 120*d**15*x**15)/(3*b**6*c**15*d*log(
F)**6 + 45*b**6*c**14*d**2*x*log(F)**6 + 315*b**6*c**13*d**3*x**2*log(F)**6
```

```
 + 1365*b**6*c**12*d**4*x**3*log(F)**6 + 4095*b**6*c**11*d**5*x**4*log(F)**
6 + 9009*b**6*c**10*d**6*x**5*log(F)**6 + 15015*b**6*c**9*d**7*x**6*log(F)*
*6 + 19305*b**6*c**8*d**8*x**7*log(F)**6 + 19305*b**6*c**7*d**9*x**8*log(F)
**6 + 15015*b**6*c**6*d**10*x**9*log(F)**6 + 9009*b**6*c**5*d**11*x**10*log
(F)**6 + 4095*b**6*c**4*d**12*x**11*log(F)**6 + 1365*b**6*c**3*d**13*x**12*
log(F)**6 + 315*b**6*c**2*d**14*x**13*log(F)**6 + 45*b**6*c*d**15*x**14*log
(F)**6 + 3*b**6*d**16*x**15*log(F)**6)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^19,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c)^19, x)
```

Mupad [B]
time = 5.77, size = 854, normalized size = 7.56

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)/(c + d*x)^19,x)
```

```
[Out] (F^a*F^(b/(c^3 + d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x))*((40*x^15)/(b^6*d*log(
F)^6) - (b^5*log(F)^5 - 120*c^15 + 120*b*c^12*log(F) - 5*b^4*c^3*log(F)^4 +
 20*b^3*c^6*log(F)^3 - 60*b^2*c^9*log(F)^2)/(3*b^6*d^16*log(F)^6) + (600*c*
x^14)/(b^6*d^2*log(F)^6) + (4200*c^2*x^13)/(b^6*d^3*log(F)^6) + (5*x^3*(b^4
*log(F)^4 + 10920*c^12 - 5280*b*c^9*log(F) - 80*b^3*c^3*log(F)^3 + 1008*b^2
*c^6*log(F)^2))/(3*b^6*d^13*log(F)^6) - (20*x^6*(b^3*log(F)^3 - 30030*c^9 +
 5544*b*c^6*log(F) - 252*b^2*c^3*log(F)^2))/(3*b^6*d^10*log(F)^6) + (20*x^9
*(b^2*log(F)^2 + 10010*c^6 - 440*b*c^3*log(F)))/(b^6*d^7*log(F)^6) - (40*x^
12*(b*log(F) - 455*c^3))/(b^6*d^4*log(F)^6) + (5*c^2*x*(b^4*log(F)^4 + 120*
c^12 - 96*b*c^9*log(F) - 8*b^3*c^3*log(F)^3 + 36*b^2*c^6*log(F)^2))/(b^6*d^
15*log(F)^6) + (5*c*x^2*(b^4*log(F)^4 + 840*c^12 - 528*b*c^9*log(F) - 20*b^
3*c^3*log(F)^3 + 144*b^2*c^6*log(F)^2))/(b^6*d^14*log(F)^6) - (40*c*x^5*(b^
3*log(F)^3 - 3003*c^9 + 792*b*c^6*log(F) - 63*b^2*c^3*log(F)^2))/(b^6*d^11*
log(F)^6) + (180*c*x^8*(b^2*log(F)^2 + 1430*c^6 - 110*b*c^3*log(F)))/(b^6*d
^8*log(F)^6) - (120*c*x^11*(4*b*log(F) - 455*c^3))/(b^6*d^5*log(F)^6) - (20
*c^2*x^4*(5*b^3*log(F)^3 - 2730*c^9 + 990*b*c^6*log(F) - 126*b^2*c^3*log(F)
^2))/(b^6*d^12*log(F)^6) + (360*c^2*x^7*(2*b^2*log(F)^2 + 715*c^6 - 88*b*c^
3*log(F)))/(b^6*d^9*log(F)^6) - (1320*c^2*x^10*(2*b*log(F) - 91*c^3))/(b^6*
d^6*log(F)^6)))/(x^15 + c^15/d^15 + (15*c*x^14)/d + (15*c^14*x)/d^14 + (105
*c^2*x^13)/d^2 + (455*c^3*x^12)/d^3 + (1365*c^4*x^11)/d^4 + (3003*c^5*x^10)
```

```
/d^5 + (5005*c^6*x^9)/d^6 + (6435*c^7*x^8)/d^7 + (6435*c^8*x^7)/d^8 + (5005
*c^9*x^6)/d^9 + (3003*c^10*x^5)/d^10 + (1365*c^11*x^4)/d^11 + (455*c^12*x^3
)/d^12 + (105*c^13*x^2)/d^13)
```

3.353 $\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^3\,dx$

Optimal. Leaf size=49

$$\frac{F^a(c+dx)^4\Gamma\left(-\frac{4}{3},-\frac{b\log(F)}{(c+dx)^3}\right)\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{4/3}}{3d}$$

```
[Out] 1/3*F^a*(d*x+c)^4*GAMMA(-4/3,-b*ln(F)/(d*x+c)^3)*(-b*ln(F)/(d*x+c)^3)^(4/3)
/d
```

Rubi [A]
time = 0.03, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$\frac{F^a(c+dx)^4\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{4/3}\text{Gamma}\left(-\frac{4}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)*(c + d*x)^3,x]
```

```
[Out] (F^a*(c + d*x)^4*Gamma[-4/3, -((b*Log[F])/(c + d*x)^3)]*(-((b*Log[F])/(c +
d*x)^3))^(4/3))/(3*d)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^3\,dx=\frac{F^a(c+dx)^4\Gamma\left(-\frac{4}{3},-\frac{b\log(F)}{(c+dx)^3}\right)\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{4/3}}{3d}$$

Mathematica [A]
time = 0.02, size = 49, normalized size = 1.00

$$\frac{F^a(c+dx)^4\Gamma\left(-\frac{4}{3},-\frac{b\log(F)}{(c+dx)^3}\right)\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{4/3}}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)*(c + d*x)^3,x]
```

```
[Out] (F^a*(c + d*x)^4*Gamma[-4/3, -((b*Log[F])/(c + d*x)^3)]*(-((b*Log[F])/(c +
d*x)^3))^(4/3))/(3*d)
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(dx+c)^3}} (dx+c)^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^3)*(d*x+c)^3,x)
```

```
[Out] int(F^(a+b/(d*x+c)^3)*(d*x+c)^3,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] 1/4*(F^a*d^3*x^4 + 4*F^a*c*d^2*x^3 + 6*F^a*c^2*d*x^2 + (4*F^a*c^3 + 3*F^a*b
*log(F))*x)*F^(b/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)) + integrate(-3/
4*(F^a*b*c^4*log(F) - 3*F^a*b^2*d*x*log(F)^2)*F^(b/(d^3*x^3 + 3*c*d^2*x^2 +
 3*c^2*d*x + c^3))/(d^4*x^4 + 4*c*d^3*x^3 + 6*c^2*d^2*x^2 + 4*c^3*d*x + c^4
), x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 178 vs. 2(43) = 86.
time = 0.09, size = 178, normalized size = 3.63

$$-\frac{3\,F^{a} b d \left(-\frac{b \log(F)}{d^3}\right)^{\frac{1}{3}} \Gamma\left(\frac{2}{3}, -\frac{b \log(F)}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right) \log\left(F\right) - \left(d^4x^4+4\,cd^3x^3+6\,c^2d^2x^2+4\,c^3dx+c^4+3\,(bdx+bc)\log\left(F\right)\right)F^{\frac{ad^3x^3+3\,acd^2x^2+3\,ac^2dx+ac^3+b}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}}}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] -1/4*(3*F^a*b*d*(-b*log(F)/d^3)^(1/3)*gamma(2/3, -b*log(F)/(d^3*x^3 + 3*c*d
^2*x^2 + 3*c^2*d*x + c^3))*log(F) - (d^4*x^4 + 4*c*d^3*x^3 + 6*c^2*d^2*x^2
+ 4*c^3*d*x + c^4 + 3*(b*d*x + b*c)*log(F))*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 +
 3*a*c^2*d*x + a*c^3 + b)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)))/d
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)*(d*x+c)**3,x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**3)*(c + d*x)**3, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^3,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^3*F^(a + b/(d*x + c)^3), x)
```

Mupad [B]
time = 3.92, size = 128, normalized size = 2.61

$$\frac{F^a\,F^{\frac{b}{(c+d\,x)^3}}\,(c+d\,x)^4}{4\,d}-\frac{3\,F^a\,\Gamma\left(\frac{2}{3}\right)\,(c+d\,x)^4\,\left(-\frac{b\,\ln(F)}{(c+d\,x)^3}\right)^{4/3}}{4\,d}+\frac{3\,F^a\,\Gamma\left(\frac{2}{3},-\frac{b\,\ln(F)}{(c+d\,x)^3}\right)\,(c+d\,x)^4\,\left(-\frac{b\,\ln(F)}{(c+d\,x)^3}\right)^{4/3}}{4\,d}+\frac{3\,F^a\,F^{\frac{b}{(c+d\,x)^3}}\,b\,\ln(F)\,(c+d\,x)}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)*(c + d*x)^3,x)
```

```
[Out] (F^a*F^(b/(c + d*x)^3)*(c + d*x)^4)/(4*d) - (3*F^a*gamma(2/3)*(c + d*x)^4*(
-(b*log(F))/(c + d*x)^3)^(4/3))/(4*d) + (3*F^a*igamma(2/3, -(b*log(F))/(c +
 d*x)^3)*(c + d*x)^4*(-(b*log(F))/(c + d*x)^3)^(4/3))/(4*d) + (3*F^a*F^(b/(
c + d*x)^3)*b*log(F)*(c + d*x))/(4*d)
```

3.354 $\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)\,dx$

Optimal. Leaf size=49

$$\frac{F^a(c+dx)^2\Gamma\left(-\frac{2}{3},-\frac{b\log(F)}{(c+dx)^3}\right)\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{2/3}}{3d}$$

```
[Out] 1/3*F^a*(d*x+c)^2*GAMMA(-2/3,-b*ln(F)/(d*x+c)^3)*(-b*ln(F)/(d*x+c)^3)^(2/3)
/d
```

Rubi [A]
time = 0.02, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.053$, Rules used = {2250}

$$\frac{F^a(c+dx)^2\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{2/3}\text{Gamma}\left(-\frac{2}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)*(c + d*x),x]
```

```
[Out] (F^a*(c + d*x)^2*Gamma[-2/3, -((b*Log[F])/(c + d*x)^3)]*(-((b*Log[F])/(c +
d*x)^3))^(2/3))/(3*d)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)\,dx=\frac{F^a(c+dx)^2\Gamma\left(-\frac{2}{3},-\frac{b\log(F)}{(c+dx)^3}\right)\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{2/3}}{3d}$$

Mathematica [A]
time = 0.02, size = 49, normalized size = 1.00

$$\frac{F^a(c+dx)^2\Gamma\left(-\frac{2}{3},-\frac{b\log(F)}{(c+dx)^3}\right)\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{2/3}}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)*(c + d*x),x]
```

```
[Out] (F^a*(c + d*x)^2*Gamma[-2/3, -((b*Log[F])/(c + d*x)^3)]*(-((b*Log[F])/(c + d*x)^3))^(2/3))/(3*d)
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(dx+c)^3}} (dx+c)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^3)*(d*x+c),x)
```

```
[Out] int(F^(a+b/(d*x+c)^3)*(d*x+c),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c),x, algorithm="maxima")
```

```
[Out] 1/2*(F^a*d*x^2 + 2*F^a*c*x)*F^(b/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))
 + integrate(3/2*(F^a*b*d^2*x^2*log(F) + 2*F^a*b*c*d*x*log(F))*F^(b/(d^3*x^
3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/(d^4*x^4 + 4*c*d^3*x^3 + 6*c^2*d^2*x^2
+ 4*c^3*d*x + c^4), x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 142 vs. $2(43) = 86$.
time = 0.09, size = 142, normalized size = 2.90

$$-\frac{F^a d^2 \left(-\frac{b\log(F)}{d^3}\right)^{\frac{2}{3}} \Gamma\left(\frac{1}{3}, -\frac{b\log(F)}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right) - (d^2x^2+2\,cdx+c^2)F^{\frac{ad^3x^3+3\,acd^2x^2+3\,ac^2dx+ac^3+b}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c),x, algorithm="fricas")
```

```
[Out] -1/2*(F^a*d^2*(-b*log(F)/d^3)^(2/3)*gamma(1/3, -b*log(F)/(d^3*x^3 + 3*c*d^2
*x^2 + 3*c^2*d*x + c^3)) - (d^2*x^2 + 2*c*d*x + c^2)*F^((a*d^3*x^3 + 3*a*c*
d^2*x^2 + 3*a*c^2*d*x + a*c^3 + b)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3
)))/d
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)*(d*x+c),x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**3)*(c + d*x), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)*F^(a + b/(d*x + c)^3), x)
```

Mupad [B]
time = 4.99, size = 107, normalized size = 2.18

$$\frac{F^a\,F^{\frac{b}{(c+d\,x)^3}}\,(c+d\,x)^2}{2\,d}-\frac{F^a\,\Gamma\left(\frac{1}{3},-\frac{b\,\ln(F)}{(c+d\,x)^3}\right)\,(c+d\,x)^2\,\left(-\frac{b\,\ln(F)}{(c+d\,x)^3}\right)^{2/3}}{2\,d}+\frac{\pi\,\sqrt{3}\,F^a\,(c+d\,x)^2\,\left(-\frac{b\,\ln(F)}{(c+d\,x)^3}\right)^{2/3}}{3\,d\,\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)*(c + d*x),x)
```

```
[Out] (F^a*F^(b/(c + d*x)^3)*(c + d*x)^2)/(2*d) - (F^a*igamma(1/3, -(b*log(F))/(c
 + d*x)^3)*(c + d*x)^2*(-(b*log(F))/(c + d*x)^3)^(2/3))/(2*d) + (3^(1/2)*F^
a*pi*(c + d*x)^2*(-(b*log(F))/(c + d*x)^3)^(2/3))/(3*d*gamma(2/3))
```

3.355 $\int F^{a+\frac{b}{(c+dx)^3}}\,dx$

Optimal. Leaf size=47

$$\frac{F^a(c+dx)\Gamma\left(-\frac{1}{3},-\frac{b\log(F)}{(c+dx)^3}\right)\sqrt[3]{-\frac{b\log(F)}{(c+dx)^3}}}{3d}$$

```
[Out] 1/3*F^a*(d*x+c)*GAMMA(-1/3,-b*ln(F)/(d*x+c)^3)*(-b*ln(F)/(d*x+c)^3)^(1/3)/d
```

Rubi [A]
time = 0.01, antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2239}

$$\frac{F^a(c+dx)\sqrt[3]{-\frac{b\log(F)}{(c+dx)^3}}\,\text{Gamma}\left(-\frac{1}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3),x]
```

```
[Out] (F^a*(c + d*x)*Gamma[-1/3, -((b*Log[F])/(c + d*x)^3)]*(-((b*Log[F])/(c + d*
x)^3))^(1/3))/(3*d)
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^3}}\,dx=\frac{F^a(c+dx)\Gamma\left(-\frac{1}{3},-\frac{b\log(F)}{(c+dx)^3}\right)\sqrt[3]{-\frac{b\log(F)}{(c+dx)^3}}}{3d}$$

Mathematica [A]
time = 0.01, size = 47, normalized size = 1.00

$$\frac{F^a(c+dx)\Gamma\left(-\frac{1}{3},-\frac{b\log(F)}{(c+dx)^3}\right)\sqrt[3]{-\frac{b\log(F)}{(c+dx)^3}}}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3),x]
```

```
[Out] (F^a*(c + d*x)*Gamma[-1/3, -((b*Log[F])/(c + d*x)^3)]*(-((b*Log[F])/(c + d*
x)^3))^(1/3))/(3*d)
```

Maple [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(dx+c)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^3),x)
```

```
[Out] int(F^(a+b/(d*x+c)^3),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3),x, algorithm="maxima")
```

```
[Out] 3*F^a*b*d*integrate(F^(b/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))*x/(d^4*
x^4 + 4*c*d^3*x^3 + 6*c^2*d^2*x^2 + 4*c^3*d*x + c^4), x)*log(F) + F^a*F^(b/
(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))*x
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 129 vs. $2(41) = 82$.
time = 0.09, size = 129, normalized size = 2.74

$$-\frac{F^{a} d\left(-\frac{b\log(F)}{d^{3}}\right)^{\frac{1}{3}}\Gamma\left(\frac{2}{3}, -\frac{b\log(F)}{d^{3}x^{3}+3\,cd^{2}x^{2}+3\,c^{2}dx+c^{3}}\right) - (dx+c)F^{\frac{ad^{3}x^{3}+3\,acd^{2}x^{2}+3\,ac^{2}dx+ac^{3}+b}{d^{3}x^{3}+3\,cd^{2}x^{2}+3\,c^{2}dx+c^{3}}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3),x, algorithm="fricas")
```

```
[Out] -(F^a*d*(-b*log(F)/d^3)^(1/3)*gamma(2/3, -b*log(F)/(d^3*x^3 + 3*c*d^2*x^2 +
 3*c^2*d*x + c^3)) - (d*x + c)*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 + 3*a*c^2*d*x
+ a*c^3 + b)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)))/d
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(c+dx)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3),x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**3), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3),x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^3), x)
```

Mupad [B]
time = 3.93, size = 71, normalized size = 1.51

$$\frac{F^a\,\left(c+d\,x\right)\,\left(F^{\frac{b}{{\left(c+d\,x\right)}^3}}-\Gamma\left(\frac{2}{3},-\frac{b\,\ln\left(F\right)}{{\left(c+d\,x\right)}^3}\right)\,{\left(-\frac{b\,\ln\left(F\right)}{{\left(c+d\,x\right)}^3}\right)}^{1/3}+\Gamma\left(\frac{2}{3}\right)\,{\left(-\frac{b\,\ln\left(F\right)}{{\left(c+d\,x\right)}^3}\right)}^{1/3}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3),x)
```

```
[Out] (F^a*(c + d*x)*(F^(b/(c + d*x)^3) - igamma(2/3, -(b*log(F))/(c + d*x)^3)*(-
(b*log(F))/(c + d*x)^3)^(1/3) + gamma(2/3)*(-(b*log(F))/(c + d*x)^3)^(1/3))
)/d
```

3.356 $\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^2} dx$

Optimal. Leaf size=49

$$\frac{F^a \Gamma\left(\frac{1}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d(c+dx)\sqrt[3]{-\frac{b\log(F)}{(c+dx)^3}}}$$

```
[Out] 1/3*F^a*GAMMA(1/3,-b*ln(F)/(d*x+c)^3)/d/(d*x+c)/(-b*ln(F)/(d*x+c)^3)^(1/3)
```

Rubi [A]
time = 0.03, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$\frac{F^a \text{Gamma}\left(\frac{1}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d(c+dx)\sqrt[3]{-\frac{b\log(F)}{(c+dx)^3}}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)/(c + d*x)^2,x]
```

```
[Out] (F^a*Gamma[1/3, -((b*Log[F])/(c + d*x)^3)])/(3*d*(c + d*x)*(-((b*Log[F])/(c
 + d*x)^3))^(1/3))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^2} dx = \frac{F^a \Gamma\left(\frac{1}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d(c+dx)\sqrt[3]{-\frac{b\log(F)}{(c+dx)^3}}}$$

Mathematica [A]
time = 0.02, size = 49, normalized size = 1.00

$$\frac{F^a\Gamma\left(\frac{1}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d(c+dx)\sqrt[3]{-\frac{b\log(F)}{(c+dx)^3}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)/(c + d*x)^2,x]
```

```
[Out] (F^a*Gamma[1/3, -((b*Log[F])/(c + d*x)^3)])/(3*d*(c + d*x)*(-((b*Log[F])/(c
 + d*x)^3))^(1/3))
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^3}}}{(dx+c)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^3)/(d*x+c)^2,x)
```

```
[Out] int(F^(a+b/(d*x+c)^3)/(d*x+c)^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^2,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c)^2, x)
```

Fricas [A]
time = 0.09, size = 59, normalized size = 1.20

$$-\frac{F^a d\left(-\frac{b\log(F)}{d^3}\right)^{\frac{2}{3}}\Gamma\left(\frac{1}{3},-\frac{b\log(F)}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)}{3\,b\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] -1/3*F^a*d*(-b*log(F)/d^3)^(2/3)*gamma(1/3, -b*log(F)/(d^3*x^3 + 3*c*d^2*x^
2 + 3*c^2*d*x + c^3))/(b*log(F))
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)/(d*x+c)**2,x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**3)/(c + d*x)**2, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^2,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c)^2, x)
```

Mupad [B]
time = 3.55, size = 58, normalized size = 1.18

$$\frac{F^a\left(3\,\Gamma\left(\frac{2}{3}\right)\,\Gamma\left(\frac{1}{3},-\frac{b\,\ln(F)}{(c+d\,x)^3}\right)-2\,\pi\,\sqrt{3}\right)}{9\,d\,\Gamma\left(\frac{2}{3}\right)\,\left(c+d\,x\right)\,{\left(-\frac{b\,\ln(F)}{(c+d\,x)^3}\right)}^{1/3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)/(c + d*x)^2,x)
```

```
[Out] (F^a*(3*gamma(2/3)*igamma(1/3, -(b*log(F))/(c + d*x)^3) - 2*3^(1/2)*pi))/(9
*d*gamma(2/3)*(c + d*x)*(-(b*log(F))/(c + d*x)^3)^(1/3))
```

3.357 $\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^3}\,dx$

Optimal. Leaf size=49

$$\frac{F^a\Gamma\left(\frac{2}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d(c+dx)^2\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{2/3}}$$

```
[Out] 1/3*F^a*GAMMA(2/3,-b*ln(F)/(d*x+c)^3)/d/(d*x+c)^2/(-b*ln(F)/(d*x+c)^3)^(2/3
)
```

Rubi [A]
time = 0.03, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$\frac{F^a\text{Gamma}\left(\frac{2}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d(c+dx)^2\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)/(c + d*x)^3,x]
```

```
[Out] (F^a*Gamma[2/3, -((b*Log[F])/(c + d*x)^3)])/(3*d*(c + d*x)^2*(-((b*Log[F])/
(c + d*x)^3))^(2/3))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^3}\,dx = \frac{F^a\Gamma\left(\frac{2}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d(c+dx)^2\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{2/3}}$$

Mathematica [A]
time = 0.02, size = 49, normalized size = 1.00

$$\frac{F^a\Gamma\left(\frac{2}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d(c+dx)^2\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)/(c + d*x)^3,x]
```

```
[Out] (F^a*Gamma[2/3, -((b*Log[F])/(c + d*x)^3)])/(3*d*(c + d*x)^2*(-((b*Log[F])/
(c + d*x)^3))^(2/3))
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^3}}}{(dx+c)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^3)/(d*x+c)^3,x)
```

```
[Out] int(F^(a+b/(d*x+c)^3)/(d*x+c)^3,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c)^3, x)
```

Fricas [A]
time = 0.10, size = 58, normalized size = 1.18

$$-\frac{F^{a}\left(-\frac{b\log(F)}{d^3}\right)^{\frac{1}{3}}\Gamma\left(\frac{2}{3}, -\frac{b\log(F)}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)}{3\,b\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] -1/3*F^a*(-b*log(F)/d^3)^(1/3)*gamma(2/3, -b*log(F)/(d^3*x^3 + 3*c*d^2*x^2
+ 3*c^2*d*x + c^3))/(b*log(F))
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)/(d*x+c)**3,x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**3)/(c + d*x)**3, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^3,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c)^3, x)
```

Mupad [B]
time = 3.78, size = 48, normalized size = 0.98

$$-\frac{F^a\,\left(\Gamma\left(\frac{2}{3}\right)-\Gamma\left(\frac{2}{3},-\frac{b\,\ln\left(F\right)}{{\left(c+d\,x\right)}^3}\right)\right)}{3\,d\,{\left(c+d\,x\right)}^2\,{\left(-\frac{b\,\ln\left(F\right)}{{\left(c+d\,x\right)}^3}\right)}^{2/3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)/(c + d*x)^3,x)
```

```
[Out] -(F^a*(gamma(2/3) - igamma(2/3, -(b*log(F))/(c + d*x)^3)))/(3*d*(c + d*x)^2
*(-(b*log(F))/(c + d*x)^3)^(2/3))
```

3.358 $\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^5}\,dx$

Optimal. Leaf size=49

$$\frac{F^a\Gamma\left(\frac{4}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d(c+dx)^4\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{4/3}}$$

```
[Out] 1/3*F^a*GAMMA(4/3,-b*ln(F)/(d*x+c)^3)/d/(d*x+c)^4/(-b*ln(F)/(d*x+c)^3)^(4/3
)
```

Rubi [A]
time = 0.03, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2250}

$$\frac{F^a\text{Gamma}\left(\frac{4}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d(c+dx)^4\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{4/3}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)/(c + d*x)^5,x]
```

```
[Out] (F^a*Gamma[4/3, -((b*Log[F])/(c + d*x)^3)])/(3*d*(c + d*x)^4*(-((b*Log[F])/
(c + d*x)^3))^(4/3))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^5}\,dx=\frac{F^a\Gamma\left(\frac{4}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d(c+dx)^4\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{4/3}}$$

Mathematica [A]
time = 0.02, size = 49, normalized size = 1.00

$$\frac{F^a\Gamma\left(\frac{4}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d(c+dx)^4\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{4/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)/(c + d*x)^5,x]
```

```
[Out] (F^a*Gamma[4/3, -((b*Log[F])/(c + d*x)^3)])/(3*d*(c + d*x)^4*(-((b*Log[F])/
(c + d*x)^3))^(4/3))
```

Maple [F]
time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^3}}}{(dx+c)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^3)/(d*x+c)^5,x)
```

```
[Out] int(F^(a+b/(d*x+c)^3)/(d*x+c)^5,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^5,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c)^5, x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 155 vs. $2(43) = 86$.
time = 0.10, size = 155, normalized size = 3.16

$$\frac{(d^3x+cd^2)F^a\left(-\frac{b\log(F)}{d^3}\right)^{\frac{2}{3}}\Gamma\left(\frac{1}{3},-\frac{b\log(F)}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)-3\,F^{\frac{ad^3x^3+3\,acd^2x^2+3\,ac^2dx+ac^3+b}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}}b\log(F)}{9\,(b^2d^2x+b^2cd)\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^5,x, algorithm="fricas")
```

```
[Out] 1/9*((d^3*x + c*d^2)*F^a*(-b*log(F)/d^3)^(2/3)*gamma(1/3, -b*log(F)/(d^3*x^
3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)) - 3*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 + 3*a
*c^2*d*x + a*c^3 + b)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))*b*log(F))/
((b^2*d^2*x + b^2*c*d)*log(F)^2)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)/(d*x+c)**5,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^5,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c)^5, x)
```

Mupad [B]
time = 4.13, size = 114, normalized size = 2.33

$$\frac{F^a\,\Gamma\left(\frac{1}{3},-\frac{b\,\ln(F)}{(c+d\,x)^3}\right)}{9\,d\,(c+d\,x)^4\,\left(-\frac{b\,\ln(F)}{(c+d\,x)^3}\right)^{4/3}}-\frac{F^a\,F^{\frac{b}{(c+d\,x)^3}}}{3\,b\,d\,\ln(F)\,\left(c+d\,x\right)}-\frac{2\,\pi\,\sqrt{3}\,F^a}{27\,d\,\Gamma\left(\frac{2}{3}\right)\,\left(c+d\,x\right)^4\,\left(-\frac{b\,\ln(F)}{(c+d\,x)^3}\right)^{4/3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)/(c + d*x)^5,x)
```

```
[Out] (F^a*igamma(1/3, -(b*log(F))/(c + d*x)^3))/(9*d*(c + d*x)^4*(-(b*log(F))/(c
 + d*x)^3)^(4/3)) - (F^a*F^(b/(c + d*x)^3))/(3*b*d*log(F)*(c + d*x)) - (2*3
^(1/2)*F^a*pi)/(27*d*gamma(2/3)*(c + d*x)^4*(-(b*log(F))/(c + d*x)^3)^(4/3)
)
```

3.359 $\int F^{a+b(c+dx)^n}(c+dx)^m\,dx$

Optimal. Leaf size=61

$$-\frac{F^a(c+dx)^{1+m}\Gamma\left(\frac{1+m}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{-\frac{1+m}{n}}}{dn}$$

```
[Out] -F^a*(d*x+c)^(1+m)*GAMMA((1+m)/n,-b*(d*x+c)^n*ln(F))/d/n/((-b*(d*x+c)^n*ln(
F))^((1+m)/n))
```

Rubi [A]
time = 0.02, antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}=0.048$, Rules used = {2250}

$$-\frac{F^a(c+dx)^{m+1}\left(-b\log(F)(c+dx)^n\right)^{-\frac{m+1}{n}}\operatorname{Gamma}\left(\frac{m+1}{n},-b\log(F)(c+dx)^n\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^m,x]
```

```
[Out] -((F^a*(c + d*x)^(1 + m)*Gamma[(1 + m)/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-
(b*(c + d*x)^n*Log[F]))^((1 + m)/n)))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)^m\,dx=-\frac{F^a(c+dx)^{1+m}\Gamma\left(\frac{1+m}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{-\frac{1+m}{n}}}{dn}$$

Mathematica [A]
time = 0.02, size = 61, normalized size = 1.00

$$-\frac{F^a(c+dx)^{1+m}\Gamma\left(\frac{1+m}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{-\frac{1+m}{n}}}{dn}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^m,x]
```

```
[Out] -((F^a*(c + d*x)^(1 + m)*Gamma[(1 + m)/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-
(b*(c + d*x)^n*Log[F]))^((1 + m)/n)))
```

Maple [**F**]
time = 0.03, size = 0, normalized size = 0.00

$$\int F^{a+b(dx+c)^n}(dx+c)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^n)*(d*x+c)^m,x)
```

```
[Out] int(F^(a+b*(d*x+c)^n)*(d*x+c)^m,x)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^m,x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^m*F^((d*x + c)^n*b + a), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^m,x, algorithm="fricas")
```

```
[Out] integral((d*x + c)^m*F^((d*x + c)^n*b + a), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**m,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^m,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^m*F^((d*x + c)^n*b + a), x)
```

Mupad [B]
time = 3.98, size = 93, normalized size = 1.52

$$\frac{F^{a+\frac{b\,{\left(c+d\,x\right)}^n}{2}}\,{\left(c+d\,x\right)}^{m+1}\,\mathrm{M}_{-\frac{\frac{m}{2}-\frac{n}{2}+\frac{1}{2}}{n},\frac{\frac{m}{2}+\frac{1}{2}}{n}}\left(b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^n\right)}{d\,\left(m+1\right)\,{\left(b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^n\right)}^{\frac{m}{2\,n}+\frac{1}{2\,n}+\frac{1}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)*(c + d*x)^m,x)
```

```
[Out] (F^(a + (b*(c + d*x)^n)/2)*(c + d*x)^(m + 1)*whittakerM(-(m/2 - n/2 + 1/2)/
n, (m/2 + 1/2)/n, b*log(F)*(c + d*x)^n))/(d*(m + 1)*(b*log(F)*(c + d*x)^n)^
(m/(2*n) + 1/(2*n) + 1/2))
```

3.360 $\int F^{a+b(c+dx)^n}(c+dx)^3\,dx$

Optimal. Leaf size=54

$$-\frac{F^a(c+dx)^4\Gamma\left(\frac{4}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{-4/n}}{dn}$$

```
[Out] -F^a*(d*x+c)^4*GAMMA(4/n,-b*(d*x+c)^n*ln(F))/d/n/((-b*(d*x+c)^n*ln(F))^(4/n
))
```

Rubi [A]
time = 0.02, antiderivative size = 54, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$-\frac{F^a(c+dx)^4\left(-b\log(F)(c+dx)^n\right)^{-4/n}\text{Gamma}\left(\frac{4}{n},-b\log(F)(c+dx)^n\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^3,x]
```

```
[Out] -((F^a*(c + d*x)^4*Gamma[4/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)
^n*Log[F]))^(4/n)))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)^3\,dx=-\frac{F^a(c+dx)^4\Gamma\left(\frac{4}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{-4/n}}{dn}$$

Mathematica [A]
time = 0.01, size = 54, normalized size = 1.00

$$-\frac{F^a(c+dx)^4\Gamma\left(\frac{4}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{-4/n}}{dn}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^3,x]
```

```
[Out] -((F^a*(c + d*x)^4*Gamma[4/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)
^n*Log[F]))^(4/n)))
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int F^{a+b(dx+c)^n}(dx+c)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^n)*(d*x+c)^3,x)
```

```
[Out] int(F^(a+b*(d*x+c)^n)*(d*x+c)^3,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^3*F^((d*x + c)^n*b + a), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] integral((d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)*F^((d*x + c)^n*b + a), x
)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**3,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^3,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^3*F^((d*x + c)^n*b + a), x)
```

Mupad [B]
time = 3.86, size = 73, normalized size = 1.35

$$\frac{F^a\,e^{\frac{b\,\ln(F)\,(c+d\,x)^n}{2}}\,(c+d\,x)^4\,\mathrm{M}_{\frac{1}{2}-\frac{2}{n},\frac{2}{n}}\left(b\,\ln\left(F\right)\,\left(c+d\,x\right)^n\right)}{4\,d\,\left(b\,\ln\left(F\right)\,\left(c+d\,x\right)^n\right)^{\frac{2}{n}+\frac{1}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)*(c + d*x)^3,x)
```

```
[Out] (F^a*exp((b*log(F)*(c + d*x)^n)/2)*(c + d*x)^4*whittakerM(1/2 - 2/n, 2/n, b
*log(F)*(c + d*x)^n))/(4*d*(b*log(F)*(c + d*x)^n)^(2/n + 1/2))
```

3.361 $\int F^{a+b(c+dx)^n}(c+dx)^2\,dx$

Optimal. Leaf size=54

$$-\frac{F^a(c+dx)^3\Gamma\left(\frac{3}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{-3/n}}{dn}$$

```
[Out] -F^a*(d*x+c)^3*GAMMA(3/n,-b*(d*x+c)^n*ln(F))/d/n/((-b*(d*x+c)^n*ln(F))^(3/n
))
```

Rubi [A]
time = 0.02, antiderivative size = 54, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$-\frac{F^a(c+dx)^3\left(-b\log(F)(c+dx)^n\right)^{-3/n}\text{Gamma}\left(\frac{3}{n},-b\log(F)(c+dx)^n\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^2,x]
```

```
[Out] -((F^a*(c + d*x)^3*Gamma[3/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)
^n*Log[F]))^(3/n)))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)^2\,dx=-\frac{F^a(c+dx)^3\Gamma\left(\frac{3}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{-3/n}}{dn}$$

Mathematica [A]
time = 0.01, size = 54, normalized size = 1.00

$$-\frac{F^a(c+dx)^3\Gamma\left(\frac{3}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{-3/n}}{dn}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^2,x]
[Out] -((F^a*(c + d*x)^3*Gamma[3/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)
^n*Log[F]))^(3/n)))
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int F^{a+b(dx+c)^n}(dx+c)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^n)*(d*x+c)^2,x)
[Out] int(F^(a+b*(d*x+c)^n)*(d*x+c)^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^2,x, algorithm="maxima")
[Out] integrate((d*x + c)^2*F^((d*x + c)^n*b + a), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^2,x, algorithm="fricas")
[Out] integral((d^2*x^2 + 2*c*d*x + c^2)*F^((d*x + c)^n*b + a), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\begin{cases} F^{a+\frac{b}{c^3}}c^2x & \text{for}\ d=0\wedge n=-3 \\ F^{a+bc^n}c^2x & \text{for}\ d=0 \\ \int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^2\,dx & \text{for}\ n=-3 \\ \frac{3F^aF^{b(c+dx)^n}bc^3n(c+dx)^n\log(F)}{3dn+9d} - \frac{3F^aF^{b(c+dx)^n}bc^2dnx(c+dx)^n\log(F)}{3dn+9d} - \frac{3F^aF^{b(c+dx)^n}bcd^2nx^2(c+dx)^n\log(F)}{3dn+9d} - \frac{F^aF^{b(c+dx)^n}bd^3nx^3(c+dx)^n\log(F)}{3dn+9d} - \frac{3F^aF^{b(c+dx)^n}c^3n}{3dn+9d} + \frac{3F^aF^{b(c+dx)^n}c^3}{3dn+9d} + \frac{3F^aF^{b(c+dx)^n}c^2dnx}{3dn+9d} + \frac{9F^aF^{b(c+dx)^n}c^2dx}{3dn+9d} + \frac{3F^aF^{b(c+dx)^n}cd^2nx^2}{3dn+9d} + \frac{9F^aF^{b(c+dx)^n}cd^2x^2}{3dn+9d} + \frac{F^aF^{b(c+dx)^n}d^3nx^3}{3dn+9d} + \frac{3F^aF^{b(c+dx)^n}d^3x^3}{3dn+9d} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**2,x)
[Out] Piecewise((F**(a + b/c**3)*c**2*x, Eq(d, 0) & Eq(n, -3)), (F**(a + b*c**n)*
c**2*x, Eq(d, 0)), (Integral(F**(a + b/(c + d*x)**3)*(c + d*x)**2, x), Eq(n
```

```
, -3)), (3*F**a*F**(b*(c + d*x)**n)*b*c**3*n*(c + d*x)**n*log(F)/(3*d*n + 9
*d) - 3*F**a*F**(b*(c + d*x)**n)*b*c**2*d*n*x*(c + d*x)**n*log(F)/(3*d*n +
9*d) - 3*F**a*F**(b*(c + d*x)**n)*b*c*d**2*n*x**2*(c + d*x)**n*log(F)/(3*d*
n + 9*d) - F**a*F**(b*(c + d*x)**n)*b*d**3*n*x**3*(c + d*x)**n*log(F)/(3*d*
n + 9*d) - 3*F**a*F**(b*(c + d*x)**n)*c**3*n/(3*d*n + 9*d) + 3*F**a*F**(b*(
c + d*x)**n)*c**3/(3*d*n + 9*d) + 3*F**a*F**(b*(c + d*x)**n)*c**2*d*n*x/(3*
d*n + 9*d) + 9*F**a*F**(b*(c + d*x)**n)*c**2*d*x/(3*d*n + 9*d) + 3*F**a*F**
(b*(c + d*x)**n)*c*d**2*n*x**2/(3*d*n + 9*d) + 9*F**a*F**(b*(c + d*x)**n)*c
*d**2*x**2/(3*d*n + 9*d) + F**a*F**(b*(c + d*x)**n)*d**3*n*x**3/(3*d*n + 9*
d) + 3*F**a*F**(b*(c + d*x)**n)*d**3*x**3/(3*d*n + 9*d), True))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^2,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^2*F^((d*x + c)^n*b + a), x)
```

Mupad [B]
time = 3.90, size = 73, normalized size = 1.35

$$\frac{F^a\,\mathrm{e}^{\frac{b\,\ln(F)\,(c+d\,x)^n}{2}}\,(c+d\,x)^3\,\mathrm{M}_{\frac{1}{2}-\frac{3}{2\,n},\frac{3}{2\,n}}\left(b\,\ln\left(F\right)\,\left(c+d\,x\right)^n\right)}{3\,d\,\left(b\,\ln\left(F\right)\,\left(c+d\,x\right)^n\right)^{\frac{3}{2\,n}+\frac{1}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)*(c + d*x)^2,x)
```

```
[Out] (F^a*exp((b*log(F)*(c + d*x)^n)/2)*(c + d*x)^3*whittakerM(1/2 - 3/(2*n), 3/
(2*n), b*log(F)*(c + d*x)^n))/(3*d*(b*log(F)*(c + d*x)^n)^(3/(2*n) + 1/2))
```

3.362 $\int F^{a+b(c+dx)^n}(c+dx)\,dx$

Optimal. Leaf size=54

$$-\frac{F^a(c+dx)^2\Gamma\left(\frac{2}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{-2/n}}{dn}$$

```
[Out] -F^a*(d*x+c)^2*GAMMA(2/n,-b*(d*x+c)^n*ln(F))/d/n/((-b*(d*x+c)^n*ln(F))^(2/n
))
```

Rubi [A]
time = 0.01, antiderivative size = 54, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.053, Rules used = {2250}

$$-\frac{F^a(c+dx)^2\left(-b\log(F)(c+dx)^n\right)^{-2/n}\text{Gamma}\left(\frac{2}{n},-b\log(F)(c+dx)^n\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x),x]
```

```
[Out] -((F^a*(c + d*x)^2*Gamma[2/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)
^n*Log[F]))^(2/n)))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)\,dx=-\frac{F^a(c+dx)^2\Gamma\left(\frac{2}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{-2/n}}{dn}$$

Mathematica [A]
time = 0.01, size = 54, normalized size = 1.00

$$-\frac{F^a(c+dx)^2\Gamma\left(\frac{2}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{-2/n}}{dn}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x),x]
```

```
[Out] -((F^a*(c + d*x)^2*Gamma[2/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)
^n*Log[F]))^(2/n)))
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int F^{a+b(dx+c)^n}(dx+c)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^n)*(d*x+c),x)
```

```
[Out] int(F^(a+b*(d*x+c)^n)*(d*x+c),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c),x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)*F^((d*x + c)^n*b + a), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c),x, algorithm="fricas")
```

```
[Out] integral((d*x + c)*F^((d*x + c)^n*b + a), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\begin{cases} F^{a+\frac{b}{c^2}}cx & \text{for}\ d=0 \wedge n=-2 \\ F^{a+bc^n}cx & \text{for}\ d=0 \\ \int F^{a+\frac{b}{(c+dx)^2}}(c+dx)\,dx & \text{for}\ n=-2 \\ \frac{2F^aF^{b(c+dx)^n}bc^2n(c+dx)^n\log(F)}{2dn+4d} - \frac{2F^aF^{b(c+dx)^n}bcdnx(c+dx)^n\log(F)}{2dn+4d} - \frac{F^aF^{b(c+dx)^n}bd^2nx^2(c+dx)^n\log(F)}{2dn+4d} - \frac{2F^aF^{b(c+dx)^n}c^2n}{2dn+4d} + \frac{2F^aF^{b(c+dx)^n}c^2}{2dn+4d} + \frac{2F^aF^{b(c+dx)^n}cdnx}{2dn+4d} + \frac{4F^aF^{b(c+dx)^n}cdx}{2dn+4d} + \frac{F^aF^{b(c+dx)^n}d^2nx^2}{2dn+4d} + \frac{2F^aF^{b(c+dx)^n}d^2x^2}{2dn+4d} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c),x)
```

```
[Out] Piecewise((F**(a + b/c**2)*c*x, Eq(d, 0) & Eq(n, -2)), (F**(a + b*c**n)*c*x
, Eq(d, 0)), (Integral(F**(a + b/(c + d*x)**2)*(c + d*x), x), Eq(n, -2)), (
```

```
2*F**a*F**(b*(c + d*x)**n)*b*c**2*n*(c + d*x)**n*log(F)/(2*d*n + 4*d) - 2*F
**a*F**(b*(c + d*x)**n)*b*c*d*n*x*(c + d*x)**n*log(F)/(2*d*n + 4*d) - F**a*
F**(b*(c + d*x)**n)*b*d**2*n*x**2*(c + d*x)**n*log(F)/(2*d*n + 4*d) - 2*F**
a*F**(b*(c + d*x)**n)*c**2*n/(2*d*n + 4*d) + 2*F**a*F**(b*(c + d*x)**n)*c**
2/(2*d*n + 4*d) + 2*F**a*F**(b*(c + d*x)**n)*c*d*n*x/(2*d*n + 4*d) + 4*F**a
*F**(b*(c + d*x)**n)*c*d*x/(2*d*n + 4*d) + F**a*F**(b*(c + d*x)**n)*d**2*n*
x**2/(2*d*n + 4*d) + 2*F**a*F**(b*(c + d*x)**n)*d**2*x**2/(2*d*n + 4*d), Tr
ue))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c),x, algorithm="giac")
[Out] integrate((d*x + c)*F^((d*x + c)^n*b + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int F^{a+b\,(c+d\,x)^n}\,\left(c+d\,x\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)*(c + d*x),x)
[Out] int(F^(a + b*(c + d*x)^n)*(c + d*x), x)
```

3.363 $\int F^{a+b(c+dx)^n}\,dx$

Optimal. Leaf size=50

$$-\frac{F^a(c+dx)\Gamma\left(\frac{1}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{-1/n}}{dn}$$

```
[Out] -F^a*(d*x+c)*GAMMA(1/n,-b*(d*x+c)^n*ln(F))/d/n/((-b*(d*x+c)^n*ln(F))^(1/n))
```

Rubi [A]
time = 0.00, antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2239}

$$-\frac{F^a(c+dx)\left(-b\log(F)(c+dx)^n\right)^{-1/n}\text{Gamma}\left(\frac{1}{n},-b\log(F)(c+dx)^n\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n),x]
```

```
[Out] -((F^a*(c + d*x)*Gamma[n^(-1), -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x
)^n*Log[F]))^n^(-1)))
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}\,dx=-\frac{F^a(c+dx)\Gamma\left(\frac{1}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{-1/n}}{dn}$$

Mathematica [A]
time = 0.01, size = 50, normalized size = 1.00

$$-\frac{F^a(c+dx)\Gamma\left(\frac{1}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{-1/n}}{dn}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n),x]
```

[Out] -((F^a*(c + d*x)*Gamma[n^(-1), -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x
)^n*Log[F]))^n^(-1)))

Maple [**F**]
time = 0.01, size = 0, normalized size = 0.00

$$\int F^{a+b(dx+c)^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a+b*(d*x+c)^n),x)

[Out] int(F^(a+b*(d*x+c)^n),x)

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b*(d*x+c)^n),x, algorithm="maxima")

[Out] integrate(F^((d*x + c)^n*b + a), x)

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b*(d*x+c)^n),x, algorithm="fricas")

[Out] integral(F^((d*x + c)^n*b + a), x)

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\begin{cases} F^{a+\frac{b}{c}}x & \text{for}\ d=0 \wedge n=-1 \\ F^{a+bc^n}x & \text{for}\ d=0 \\ \int F^{a+\frac{b}{c+dx}}\,dx & \text{for}\ n=-1 \\ \frac{F^aF^{b(c+dx)^n}bcn(c+dx)^n\log(F)}{dn+d} - \frac{F^aF^{b(c+dx)^n}bdnx(c+dx)^n\log(F)}{dn+d} - \frac{F^aF^{b(c+dx)^n}cn}{dn+d} + \frac{F^aF^{b(c+dx)^n}c}{dn+d} + \frac{F^aF^{b(c+dx)^n}dnx}{dn+d} + \frac{F^aF^{b(c+dx)^n}dx}{dn+d} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F**(a+b*(d*x+c)**n),x)

[Out] Piecewise((F**(a + b/c)*x, Eq(d, 0) & Eq(n, -1)), (F**(a + b*c**n)*x, Eq(d,
 0)), (Integral(F**(a + b/(c + d*x)), x), Eq(n, -1)), (F**a*F**(b*(c + d*x)

```
**n)*b*c*n*(c + d*x)**n*log(F)/(d*n + d) - F**a*F**(b*(c + d*x)**n)*b*d*n*x
*(c + d*x)**n*log(F)/(d*n + d) - F**a*F**(b*(c + d*x)**n)*c*n/(d*n + d) + F
**a*F**(b*(c + d*x)**n)*c/(d*n + d) + F**a*F**(b*(c + d*x)**n)*d*n*x/(d*n +
 d) + F**a*F**(b*(c + d*x)**n)*d*x/(d*n + d), True))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n),x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^n*b + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int F^{a+b\,{\left(c+d\,x\right)}^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n),x)
```

```
[Out] int(F^(a + b*(c + d*x)^n), x)
```

3.364 $\int \frac{F^{a+b(c+dx)^n}}{c+dx} dx$

Optimal. Leaf size=22

$$\frac{F^a \text{Ei}(b(c+dx)^n \log(F))}{dn}$$

```
[Out] F^a*Ei(b*(d*x+c)^n*ln(F))/d/n
```

Rubi [A]
time = 0.03, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2241}

$$\frac{F^a \text{Ei}(b(c+dx)^n \log(F))}{dn}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)/(c + d*x),x]
```

```
[Out] (F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(d*n)
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^n}}{c+dx} dx = \frac{F^a \text{Ei}(b(c+dx)^n \log(F))}{dn}$$

Mathematica [A]
time = 0.00, size = 22, normalized size = 1.00

$$\frac{F^a \text{Ei}(b(c+dx)^n \log(F))}{dn}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)/(c + d*x),x]
```

```
[Out] (F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(d*n)
```

Maple [A]
time = 0.11, size = 26, normalized size = 1.18

method	result	size
risch	$-\frac{F^a \operatorname{expIntegral}(1,-b(dx+c)^n \ln(F))}{dn}$	26

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^n)/(d*x+c),x,method=_RETURNVERBOSE)
```

```
[Out] -1/d/n*F^a*Ei(1,-b*(d*x+c)^n*ln(F))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c),x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^n*b + a)/(d*x + c), x)
```

Fricas [A]
time = 0.35, size = 22, normalized size = 1.00

$$\frac{F^a \operatorname{Ei}((dx+c)^n b \log(F))}{dn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c),x, algorithm="fricas")
```

```
[Out] F^a*Ei((d*x + c)^n*b*log(F))/(d*n)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^n}}{c+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)/(d*x+c),x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**n)/(c + d*x), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c),x, algorithm="giac")
[Out] integrate(F^((d*x + c)^n*b + a)/(d*x + c), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{F^a\,F^{b\,{\left(c+d\,x\right)}^n}}{c+d\,x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)/(c + d*x),x)
[Out] int((F^a*F^(b*(c + d*x)^n))/(c + d*x), x)
```

3.365 $\int \frac{F^{a+b(c+dx)^n}}{(c+dx)^2}\,dx$

Optimal. Leaf size=52

$$-\frac{F^a\Gamma\left(-\frac{1}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{\frac{1}{n}}}{dn(c+dx)}$$

```
[Out] -F^a*GAMMA(-1/n,-b*(d*x+c)^n*ln(F))*(-b*(d*x+c)^n*ln(F))^(1/n)/d/n/(d*x+c)
```

Rubi [A]
time = 0.02, antiderivative size = 52, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$-\frac{F^a\left(-b\log(F)(c+dx)^n\right)^{\frac{1}{n}}\,\text{Gamma}\left(-\frac{1}{n},-b\log(F)(c+dx)^n\right)}{dn(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)/(c + d*x)^2,x]
```

```
[Out] -((F^a*Gamma[-n^(-1), -(b*(c + d*x)^n*Log[F])]*(-(b*(c + d*x)^n*Log[F]))^n^
(-1))/(d*n*(c + d*x)))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^n}}{(c+dx)^2}\,dx=-\frac{F^a\Gamma\left(-\frac{1}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{\frac{1}{n}}}{dn(c+dx)}$$

Mathematica [A]
time = 0.01, size = 52, normalized size = 1.00

$$-\frac{F^a\Gamma\left(-\frac{1}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{\frac{1}{n}}}{dn(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)/(c + d*x)^2,x]
```

```
[Out] -((F^a*Gamma[-n^(-1), -(b*(c + d*x)^n*Log[F])]*(-(b*(c + d*x)^n*Log[F]))^n^
(-1))/(d*n*(c + d*x)))
```

Maple [F]
time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(dx+c)^n}}{(dx+c)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^n)/(d*x+c)^2,x)
```

```
[Out] int(F^(a+b*(d*x+c)^n)/(d*x+c)^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c)^2,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^n*b + a)/(d*x + c)^2, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] integral(F^((d*x + c)^n*b + a)/(d^2*x^2 + 2*c*d*x + c^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\begin{cases} \frac{\tilde{\infty} F^{a}}{x} & \text{for}\: c = 0 \wedge d = 0 \wedge n = 1 \\ \tilde{\infty} F^{0^{n} b + a} x & \text{for}\: c = - d x \\ \frac{F^{a + b c^{n}} x}{c^{2}} & \text{for}\: d = 0 \\ \int \frac{F^{a + b \left(c + d x\right)}}{\left(c + d x\right)^{2}}\, dx & \text{for}\: n = 1 \\ \frac{F^{a} F^{b \left(c + d x\right)^{n}} b n \left(c + d x\right)^{n} \log{\left(F \right)}}{c d n - c d + d^{2} n x - d^{2} x} - \frac{F^{a} F^{b \left(c + d x\right)^{n}} n}{c d n - c d + d^{2} n x - d^{2} x} + \frac{F^{a} F^{b \left(c + d x\right)^{n}}}{c d n - c d + d^{2} n x - d^{2} x} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)/(d*x+c)**2,x)
```

```
[Out] Piecewise((zoo*F**a/x, Eq(c, 0) & Eq(d, 0) & Eq(n, 1)), (zoo*F**(0**n*b + a
)*x, Eq(c, -d*x)), (F**(a + b*c**n)*x/c**2, Eq(d, 0)), (Integral(F**(a + b*
(c + d*x))/(c + d*x)**2, x), Eq(n, 1)), (F**a*F**(b*(c + d*x)**n)*b*n*(c +
d*x)**n*log(F)/(c*d*n - c*d + d**2*n*x - d**2*x) - F**a*F**(b*(c + d*x)**n)
*n/(c*d*n - c*d + d**2*n*x - d**2*x) + F**a*F**(b*(c + d*x)**n)/(c*d*n - c*
d + d**2*n*x - d**2*x), True))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c)^2,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^n*b + a)/(d*x + c)^2, x)
```

Mupad [B]
time = 3.70, size = 71, normalized size = 1.37

$$-\frac{F^a\,{\mathrm{e}}^{\frac{b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^n}{2}}\,{\left(b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^n\right)}^{\frac{1}{2\,n}-\frac{1}{2}}\,\mathrm{M}_{\frac{1}{2\,n}+\frac{1}{2},-\frac{1}{2\,n}}\left(b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^n\right)}{d\,\left(c+d\,x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)/(c + d*x)^2,x)
```

```
[Out] -(F^a*exp((b*log(F)*(c + d*x)^n)/2)*(b*log(F)*(c + d*x)^n)^(1/(2*n) - 1/2)*
whittakerM(1/(2*n) + 1/2, -1/(2*n), b*log(F)*(c + d*x)^n))/(d*(c + d*x))
```

3.366 $\int \frac{F^{a+b(c+dx)^n}}{(c+dx)^3}\,dx$

Optimal. Leaf size=54

$$-\frac{F^a\Gamma\left(-\frac{2}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{2/n}}{dn(c+dx)^2}$$

```
[Out] -F^a*GAMMA(-2/n,-b*(d*x+c)^n*ln(F))*(-b*(d*x+c)^n*ln(F))^(2/n)/d/n/(d*x+c)^
2
```

Rubi [A]
time = 0.02, antiderivative size = 54, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$-\frac{F^a\left(-b\log(F)(c+dx)^n\right)^{2/n}\text{Gamma}\left(-\frac{2}{n},-b\log(F)(c+dx)^n\right)}{dn(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)/(c + d*x)^3,x]
```

```
[Out] -((F^a*Gamma[-2/n, -(b*(c + d*x)^n*Log[F])]*(-(b*(c + d*x)^n*Log[F]))^(2/n)
)/(d*n*(c + d*x)^2))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^n}}{(c+dx)^3}\,dx = -\frac{F^a\Gamma\left(-\frac{2}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{2/n}}{dn(c+dx)^2}$$

Mathematica [A]
time = 0.01, size = 54, normalized size = 1.00

$$-\frac{F^a\Gamma\left(-\frac{2}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{2/n}}{dn(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)/(c + d*x)^3,x]
```

```
[Out] -((F^a*Gamma[-2/n, -(b*(c + d*x)^n*Log[F])]*(-(b*(c + d*x)^n*Log[F]))^(2/n)
)/(d*n*(c + d*x)^2))
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(dx+c)^n}}{(dx+c)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^n)/(d*x+c)^3,x)
```

```
[Out] int(F^(a+b*(d*x+c)^n)/(d*x+c)^3,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^n*b + a)/(d*x + c)^3, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] integral(F^((d*x + c)^n*b + a)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3), x
)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\begin{cases} \frac{F^{a+bc^2}x}{c^3} & \text{for}\: d=0 \wedge n=2 \\ \frac{F^{a+bc^n}x}{c^3} & \text{for}\: d=0 \\ \int \frac{F^{a+b(c+dx)^2}}{(c+dx)^3}\, dx & \text{for}\: n=2 \\ \frac{F^a F^{b(c+dx)^n} bn(c+dx)^n \log(F)}{2c^2dn-4c^2d+4cd^2nx-8cd^2x+2d^3nx^2-4d^3x^2} - \frac{F^a F^{b(c+dx)^n} n}{2c^2dn-4c^2d+4cd^2nx-8cd^2x+2d^3nx^2-4d^3x^2} + \frac{2F^a F^{b(c+dx)^n}}{2c^2dn-4c^2d+4cd^2nx-8cd^2x+2d^3nx^2-4d^3x^2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)/(d*x+c)**3,x)
```

```
[Out] Piecewise((F**(a + b*c**2)*x/c**3, Eq(d, 0) & Eq(n, 2)), (F**(a + b*c**n)*x
/c**3, Eq(d, 0)), (Integral(F**(a + b*(c + d*x)**2)/(c + d*x)**3, x), Eq(n,
 2)), (F**a*F**(b*(c + d*x)**n)*b*n*(c + d*x)**n*log(F)/(2*c**2*d*n - 4*c**
2*d + 4*c*d**2*n*x - 8*c*d**2*x + 2*d**3*n*x**2 - 4*d**3*x**2) - F**a*F**(b
*(c + d*x)**n)*n/(2*c**2*d*n - 4*c**2*d + 4*c*d**2*n*x - 8*c*d**2*x + 2*d**
3*n*x**2 - 4*d**3*x**2) + 2*F**a*F**(b*(c + d*x)**n)/(2*c**2*d*n - 4*c**2*d
 + 4*c*d**2*n*x - 8*c*d**2*x + 2*d**3*n*x**2 - 4*d**3*x**2), True))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c)^3,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^n*b + a)/(d*x + c)^3, x)
```

Mupad [B]
time = 3.72, size = 67, normalized size = 1.24

$$-\frac{F^a\,\mathrm{e}^{\frac{b\,\ln(F)\,(c+d\,x)^n}{2}}\,\mathrm{M}_{\frac{1}{n}+\frac{1}{2},-\frac{1}{n}}\left(b\,\ln\left(F\right)\,\left(c+d\,x\right)^n\right)\,\left(b\,\ln\left(F\right)\,\left(c+d\,x\right)^n\right)^{\frac{1}{n}-\frac{1}{2}}}{2\,d\,\left(c+d\,x\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)/(c + d*x)^3,x)
```

```
[Out] -(F^a*exp((b*log(F)*(c + d*x)^n)/2)*whittakerM(1/n + 1/2, -1/n, b*log(F)*(c
 + d*x)^n)*(b*log(F)*(c + d*x)^n)^(1/n - 1/2))/(2*d*(c + d*x)^2)
```

3.367 $\int \frac{F^{a+b(c+dx)^n}}{(c+dx)^4}\,dx$

Optimal. Leaf size=54

$$-\frac{F^a\Gamma\left(-\frac{3}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{3/n}}{dn(c+dx)^3}$$

```
[Out] -F^a*GAMMA(-3/n,-b*(d*x+c)^n*ln(F))*(-b*(d*x+c)^n*ln(F))^(3/n)/d/n/(d*x+c)^
3
```

Rubi [A]
time = 0.03, antiderivative size = 54, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2250}

$$-\frac{F^a(-b\log(F)(c+dx)^n)^{3/n}\,\text{Gamma}\left(-\frac{3}{n},-b\log(F)(c+dx)^n\right)}{dn(c+dx)^3}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)/(c + d*x)^4,x]
```

```
[Out] -((F^a*Gamma[-3/n, -(b*(c + d*x)^n*Log[F])]*(-(b*(c + d*x)^n*Log[F]))^(3/n)
)/(d*n*(c + d*x)^3))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^n}}{(c+dx)^4}\,dx = -\frac{F^a\Gamma\left(-\frac{3}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{3/n}}{dn(c+dx)^3}$$

Mathematica [A]
time = 0.01, size = 54, normalized size = 1.00

$$-\frac{F^a\Gamma\left(-\frac{3}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{3/n}}{dn(c+dx)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)/(c + d*x)^4,x]
```

```
[Out] -((F^a*Gamma[-3/n, -(b*(c + d*x)^n*Log[F])]*(-(b*(c + d*x)^n*Log[F]))^(3/n)
)/(d*n*(c + d*x)^3))
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(dx+c)^n}}{(dx+c)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^n)/(d*x+c)^4,x)
```

```
[Out] int(F^(a+b*(d*x+c)^n)/(d*x+c)^4,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c)^4,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^n*b + a)/(d*x + c)^4, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] integral(F^((d*x + c)^n*b + a)/(d^4*x^4 + 4*c*d^3*x^3 + 6*c^2*d^2*x^2 + 4*c
^3*d*x + c^4), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)/(d*x+c)**4,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c)^4,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^n*b + a)/(d*x + c)^4, x)
```

Mupad [B]
time = 3.62, size = 71, normalized size = 1.31

$$-\frac{F^a\,\mathrm{e}^{\frac{b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^n}{2}}\,{\left(b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^n\right)}^{\frac{3}{2\,n}-\frac{1}{2}}\,\mathrm{M}_{\frac{3}{2\,n}+\frac{1}{2},-\frac{3}{2\,n}}\left(b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^n\right)}{3\,d\,{\left(c+d\,x\right)}^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)/(c + d*x)^4,x)
```

```
[Out] -(F^a*exp((b*log(F)*(c + d*x)^n)/2)*(b*log(F)*(c + d*x)^n)^(3/(2*n) - 1/2)*
whittakerM(3/(2*n) + 1/2, -3/(2*n), b*log(F)*(c + d*x)^n))/(3*d*(c + d*x)^3
)
```

3.368 $\int F^{a+b(c+dx)^n}(c+dx)^{-1+6n}\,dx$

Optimal. Leaf size=114

$$-\frac{F^{a+b(c+dx)^n}\left(120-120b(c+dx)^n\log(F)+60b^2(c+dx)^{2n}\log^2(F)-20b^3(c+dx)^{3n}\log^3(F)+5b^4(c+dx)\right.}{b^6dn\log^6(F)}$$

```
[Out] -F^(a+b*(d*x+c)^n)*(120-120*b*(d*x+c)^n*ln(F)+60*b^2*(d*x+c)^(2*n)*ln(F)^2-
20*b^3*(d*x+c)^(3*n)*ln(F)^3+5*b^4*(d*x+c)^(4*n)*ln(F)^4-b^5*(d*x+c)^(5*n)*
ln(F)^5)/b^6/d/n/ln(F)^6
```

Rubi [A]
time = 0.05, antiderivative size = 114, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.040$, Rules used = {2249}

$$-\frac{F^{a+b(c+dx)^n}\left(-b^5\log^5(F)(c+dx)^{5n}+5b^4\log^4(F)(c+dx)^{4n}-20b^3\log^3(F)(c+dx)^{3n}+60b^2\log^2(F)(c+dx)^{2n}-120b\log(F)(c+dx)^n+120\right)}{b^6dn\log^6(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 + 6*n),x]
```

```
[Out] -((F^(a + b*(c + d*x)^n)*(120 - 120*b*(c + d*x)^n*Log[F] + 60*b^2*(c + d*x)
^(2*n)*Log[F]^2 - 20*b^3*(c + d*x)^(3*n)*Log[F]^3 + 5*b^4*(c + d*x)^(4*n)*L
og[F]^4 - b^5*(c + d*x)^(5*n)*Log[F]^5))/(b^6*d*n*Log[F]^6))
```

Rule 2249

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> With[{p = Simplify[(m + 1)/n]}, Simp[(-F^a)*((f/d)^m/(d*n*
((-b)*Log[F])^p))*Simplify[FunctionExpand[Gamma[p, (-b)*(c + d*x)^n*Log[F]]
]], x] /; IGtQ[p, 0]] /; FreeQ[{F, a, b, c, d, e, f, m, n}, x] && EqQ[d*e -
 c*f, 0] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)^{-1+6n}\,dx = -\frac{F^a\Gamma(6,-b(c+dx)^n\log(F))}{b^6dn\log^6(F)}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.01, size = 32, normalized size = 0.28

$$-\frac{F^a\Gamma(6,-b(c+dx)^n\log(F))}{b^6dn\log^6(F)}$$

Antiderivative was successfully verified.

[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 + 6*n),x]

[Out] -((F^a*Gamma[6, -(b*(c + d*x)^n*Log[F])])/(b^6*d*n*Log[F]^6))

Maple [A]
time = 0.07, size = 113, normalized size = 0.99

method	result	s
risch	$\frac{\left(b^5(dx+c)^{5n}\ln(F)^5-5b^4(dx+c)^{4n}\ln(F)^4+20b^3(dx+c)^{3n}\ln(F)^3-60b^2(dx+c)^{2n}\ln(F)^2+120b(dx+c)^n\ln(F)-120\right)F^{a+b(dx+c)^n}}{b^6\ln(F)^6nd}$	

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+6*n),x,method=_RETURNVERBOSE)

[Out] (((d*x+c)^n)^5*b^5*ln(F)^5-5*((d*x+c)^n)^4*b^4*ln(F)^4+20*((d*x+c)^n)^3*b^3*ln(F)^3-60*((d*x+c)^n)^2*b^2*ln(F)^2+120*b*(d*x+c)^n*ln(F)-120)/b^6/ln(F)^6/n/d*F^(a+b*(d*x+c)^n)

Maxima [A]
time = 0.29, size = 129, normalized size = 1.13

$$\frac{\left((dx+c)^{5n}F^ab^5\log(F)^5-5(dx+c)^{4n}F^ab^4\log(F)^4+20(dx+c)^{3n}F^ab^3\log(F)^3-60(dx+c)^{2n}F^ab^2\log(F)^2+120(dx+c)^nF^ab\log(F)-120F^a\right)F^{(dx+c)^nb}}{b^6dn\log(F)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+6*n),x, algorithm="maxima")

[Out] ((d*x + c)^(5*n)*F^a*b^5*log(F)^5 - 5*(d*x + c)^(4*n)*F^a*b^4*log(F)^4 + 20*(d*x + c)^(3*n)*F^a*b^3*log(F)^3 - 60*(d*x + c)^(2*n)*F^a*b^2*log(F)^2 + 120*(d*x + c)^n*F^a*b*log(F) - 120*F^a)*F^((d*x + c)^n*b)/(b^6*d*n*log(F)^6)

Fricas [A]
time = 0.38, size = 116, normalized size = 1.02

$$\frac{\left((dx+c)^{5n}b^5\log(F)^5-5(dx+c)^{4n}b^4\log(F)^4+20(dx+c)^{3n}b^3\log(F)^3-60(dx+c)^{2n}b^2\log(F)^2+120(dx+c)^nb\log(F)-120\right)e^{\left((dx+c)^nb\log(F)+a\log(F)\right)}}{b^6dn\log(F)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+6*n),x, algorithm="fricas")

[Out] ((d*x + c)^(5*n)*b^5*log(F)^5 - 5*(d*x + c)^(4*n)*b^4*log(F)^4 + 20*(d*x + c)^(3*n)*b^3*log(F)^3 - 60*(d*x + c)^(2*n)*b^2*log(F)^2 + 120*(d*x + c)^n*b*log(F) - 120)*e^((d*x + c)^n*b*log(F) + a*log(F))/(b^6*d*n*log(F)^6)

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**(-1+6*n),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+6*n),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^(6*n - 1)*F^((d*x + c)^n*b + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int F^{a+b\,{\left(c+d\,x\right)}^n}\,{\left(c+d\,x\right)}^{6\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)*(c + d*x)^(6*n - 1),x)
```

```
[Out] int(F^(a + b*(c + d*x)^n)*(c + d*x)^(6*n - 1), x)
```

3.369 $\int F^{a+b(c+dx)^n}(c+dx)^{-1+5n}\,dx$

Optimal. Leaf size=94

$$\frac{F^{a+b(c+dx)^n}\left(24-24b(c+dx)^n\log(F)+12b^2(c+dx)^{2n}\log^2(F)-4b^3(c+dx)^{3n}\log^3(F)+b^4(c+dx)^{4n}\log^4(F)\right)}{b^5dn\log^5(F)}$$

```
[Out] F^(a+b*(d*x+c)^n)*(24-24*b*(d*x+c)^n*ln(F)+12*b^2*(d*x+c)^(2*n)*ln(F)^2-4*b
^3*(d*x+c)^(3*n)*ln(F)^3+b^4*(d*x+c)^(4*n)*ln(F)^4)/b^5/d/n/ln(F)^5
```

Rubi [A]
time = 0.04, antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.040$, Rules used = {2249}

$$\frac{F^{a+b(c+dx)^n}\left(b^4\log^4(F)(c+dx)^{4n}-4b^3\log^3(F)(c+dx)^{3n}+12b^2\log^2(F)(c+dx)^{2n}-24b\log(F)(c+dx)^n+24\right)}{b^5dn\log^5(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 + 5*n),x]
```

```
[Out] (F^(a + b*(c + d*x)^n)*(24 - 24*b*(c + d*x)^n*Log[F] + 12*b^2*(c + d*x)^(2*
n)*Log[F]^2 - 4*b^3*(c + d*x)^(3*n)*Log[F]^3 + b^4*(c + d*x)^(4*n)*Log[F]^4
))/(b^5*d*n*Log[F]^5)
```

Rule 2249

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> With[{p = Simplify[(m + 1)/n]}, Simp[(-F^a)*((f/d)^m/(d*n*
((-b)*Log[F])^p))*Simplify[FunctionExpand[Gamma[p, (-b)*(c + d*x)^n*Log[F]]
]], x] /; IGtQ[p, 0]] /; FreeQ[{F, a, b, c, d, e, f, m, n}, x] && EqQ[d*e -
 c*f, 0] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)^{-1+5n}\,dx=\frac{F^a\Gamma(5,-b(c+dx)^n\log(F))}{b^5dn\log^5(F)}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.01, size = 31, normalized size = 0.33

$$\frac{F^a\Gamma(5,-b(c+dx)^n\log(F))}{b^5dn\log^5(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 + 5*n),x]
```

```
[Out] (F^a*Gamma[5, -(b*(c + d*x)^n*Log[F])])/(b^5*d*n*Log[F]^5)
```

Maple [A]
time = 0.06, size = 95, normalized size = 1.01

method	result	size
risch	$\frac{F^{a+b(dx+c)^{n}} \left(24-24 b (dx+c)^{n} \ln \left(F\right)+12 b^{2} (dx+c)^{2 n} \ln \left(F\right)^{2}-4 b^{3} (dx+c)^{3 n} \ln \left(F\right)^{3}+b^{4} (dx+c)^{4 n} \ln \left(F\right)^{4}\right)}{b^{5} d n \ln \left(F\right)^{5}}$	95

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+5*n),x,method=_RETURNVERBOSE)
```

```
[Out] (((d*x+c)^n)^4*b^4*ln(F)^4-4*((d*x+c)^n)^3*b^3*ln(F)^3+12*((d*x+c)^n)^2*b^2
*ln(F)^2-24*b*(d*x+c)^n*ln(F)+24)/b^5/ln(F)^5/n/d*F^(a+b*(d*x+c)^n)
```

Maxima [A]
time = 0.30, size = 108, normalized size = 1.15

$$\frac{\left((dx+c)^{4n} F^a b^4 \log(F)^4 - 4(dx+c)^{3n} F^a b^3 \log(F)^3 + 12(dx+c)^{2n} F^a b^2 \log(F)^2 - 24(dx+c)^n F^a b \log(F) + 24F^a\right) F^{(dx+c)^n b}}{b^5 dn \log(F)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+5*n),x, algorithm="maxima")
```

```
[Out] ((d*x + c)^(4*n)*F^a*b^4*log(F)^4 - 4*(d*x + c)^(3*n)*F^a*b^3*log(F)^3 + 12
*(d*x + c)^(2*n)*F^a*b^2*log(F)^2 - 24*(d*x + c)^n*F^a*b*log(F) + 24*F^a)*F
^((d*x + c)^n*b)/(b^5*d*n*log(F)^5)
```

Fricas [A]
time = 0.39, size = 98, normalized size = 1.04

$$\frac{\left((dx+c)^{4n} b^4 \log(F)^4 - 4(dx+c)^{3n} b^3 \log(F)^3 + 12(dx+c)^{2n} b^2 \log(F)^2 - 24(dx+c)^n b \log(F) + 24\right) e^{\left((dx+c)^n b \log(F) + a \log(F)\right)}}{b^5 dn \log(F)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+5*n),x, algorithm="fricas")
```

```
[Out] ((d*x + c)^(4*n)*b^4*log(F)^4 - 4*(d*x + c)^(3*n)*b^3*log(F)^3 + 12*(d*x +
c)^(2*n)*b^2*log(F)^2 - 24*(d*x + c)^n*b*log(F) + 24)*e^((d*x + c)^n*b*log(
F) + a*log(F))/(b^5*d*n*log(F)^5)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**(-1+5*n),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+5*n),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^(5*n - 1)*F^((d*x + c)^n*b + a), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int F^{a+b\,(c+d\,x)^n}\,(c+d\,x)^{5\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)*(c + d*x)^(5*n - 1),x)
```

```
[Out] int(F^(a + b*(c + d*x)^n)*(c + d*x)^(5*n - 1), x)
```

3.370 $\int F^{a+b(c+dx)^n}(c+dx)^{-1+4n}\,dx$

Optimal. Leaf size=137

$$-\frac{6F^{a+b(c+dx)^n}}{b^4dn\log^4(F)}+\frac{6F^{a+b(c+dx)^n}(c+dx)^n}{b^3dn\log^3(F)}-\frac{3F^{a+b(c+dx)^n}(c+dx)^{2n}}{b^2dn\log^2(F)}+\frac{F^{a+b(c+dx)^n}(c+dx)^{3n}}{bdn\log(F)}$$

```
[Out] -6*F^(a+b*(d*x+c)^n)/b^4/d/n/ln(F)^4+6*F^(a+b*(d*x+c)^n)*(d*x+c)^n/b^3/d/n/
ln(F)^3-3*F^(a+b*(d*x+c)^n)*(d*x+c)^(2*n)/b^2/d/n/ln(F)^2+F^(a+b*(d*x+c)^n)
*(d*x+c)^(3*n)/b/d/n/ln(F)
```

Rubi [A]
time = 0.11, antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2244, 2240}

$$-\frac{6F^{a+b(c+dx)^n}}{b^4dn\log^4(F)}+\frac{6(c+dx)^nF^{a+b(c+dx)^n}}{b^3dn\log^3(F)}-\frac{3(c+dx)^{2n}F^{a+b(c+dx)^n}}{b^2dn\log^2(F)}+\frac{(c+dx)^{3n}F^{a+b(c+dx)^n}}{bdn\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 + 4*n),x]
```

```
[Out] (-6*F^(a + b*(c + d*x)^n))/(b^4*d*n*Log[F]^4) + (6*F^(a + b*(c + d*x)^n)*(c
 + d*x)^n)/(b^3*d*n*Log[F]^3) - (3*F^(a + b*(c + d*x)^n)*(c + d*x)^(2*n))/(
b^2*d*n*Log[F]^2) + (F^(a + b*(c + d*x)^n)*(c + d*x)^(3*n))/(b*d*n*Log[F])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2244

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^Simplify[m - n]*
F^(a + b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && Integer
Q[2*Simplify[(m + 1)/n]] && LtQ[0, Simplify[(m + 1)/n], 5] && !RationalQ[m
] && SumSimplerQ[m, -n]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)^{-1+4n}\,dx = \frac{F^{a+b(c+dx)^n}(c+dx)^{3n}}{bdn\log(F)} - \frac{3\int F^{a+b(c+dx)^n}(c+dx)^{-1+3n}\,dx}{b\log(F)}$$
$$= -\frac{3F^{a+b(c+dx)^n}(c+dx)^{2n}}{b^2dn\log^2(F)} + \frac{F^{a+b(c+dx)^n}(c+dx)^{3n}}{bdn\log(F)} + \frac{6\int F^{a+b(c+dx)^n}(c+dx}{b^2\log^2(F)}$$
$$= \frac{6F^{a+b(c+dx)^n}(c+dx)^{n}}{b^3dn\log^3(F)} - \frac{3F^{a+b(c+dx)^n}(c+dx)^{2n}}{b^2dn\log^2(F)} + \frac{F^{a+b(c+dx)^n}(c+dx)^{3n}}{bdn\log(F)} -$$
$$= -\frac{6F^{a+b(c+dx)^n}}{b^4dn\log^4(F)} + \frac{6F^{a+b(c+dx)^n}(c+dx)^{n}}{b^3dn\log^3(F)} - \frac{3F^{a+b(c+dx)^n}(c+dx)^{2n}}{b^2dn\log^2(F)} + \frac{F^{a+b(}}{}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.01, size = 32, normalized size = 0.23

$$-\frac{F^a\Gamma(4,-b(c+dx)^n\log(F))}{b^4dn\log^4(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 + 4*n),x]
```

```
[Out] -((F^a*Gamma[4, -(b*(c + d*x)^n*Log[F])])/(b^4*d*n*Log[F]^4))
```

Maple [A]
time = 0.06, size = 77, normalized size = 0.56

method	result	size
risch	$\frac{\left(b^3(dx+c)^{3n}\ln(F)^3-3b^2(dx+c)^{2n}\ln(F)^2+6b(dx+c)^n\ln(F)-6\right)F^{a+b(dx+c)^n}}{b^4\ln(F)^4nd}$	77

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+4*n),x,method=_RETURNVERBOSE)
```

```
[Out] (((d*x+c)^n)^3*b^3*ln(F)^3-3*((d*x+c)^n)^2*b^2*ln(F)^2+6*b*(d*x+c)^n*ln(F)-
6)/b^4/ln(F)^4/n/d*F^(a+b*(d*x+c)^n)
```

Maxima [A]
time = 0.30, size = 87, normalized size = 0.64

$$\frac{\left((dx+c)^{3\,n}F^ab^3\log\left(F\right)^3-3\,(dx+c)^{2\,n}F^ab^2\log\left(F\right)^2+6\,(dx+c)^nF^ab\log\left(F\right)-6\,F^a\right)F^{(dx+c)^nb}}{b^4dn\log\left(F\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+4*n),x, algorithm="maxima")
```

```
[Out] ((d*x + c)^(3*n)*F^a*b^3*log(F)^3 - 3*(d*x + c)^(2*n)*F^a*b^2*log(F)^2 + 6*
(d*x + c)^n*F^a*b*log(F) - 6*F^a)*F^((d*x + c)^n*b)/(b^4*d*n*log(F)^4)
```

Fricas [**A**]
time = 0.37, size = 80, normalized size = 0.58

$$\frac{\left((dx+c)^{3n}b^3\log\left(F\right)^3-3\left(dx+c\right)^{2n}b^2\log\left(F\right)^2+6\left(dx+c\right)^nb\log\left(F\right)-6\right)e^{\left((dx+c)^nb\log(F)+a\log(F)\right)}}{b^4dn\log\left(F\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+4*n),x, algorithm="fricas")
```

```
[Out] ((d*x + c)^(3*n)*b^3*log(F)^3 - 3*(d*x + c)^(2*n)*b^2*log(F)^2 + 6*(d*x + c
)^n*b*log(F) - 6)*e^((d*x + c)^n*b*log(F) + a*log(F))/(b^4*d*n*log(F)^4)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**(-1+4*n),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+4*n),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^(4*n - 1)*F^((d*x + c)^n*b + a), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int F^{a+b\,{\left(c+d\,x\right)}^n}\,{\left(c+d\,x\right)}^{4\,n-1} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)*(c + d*x)^(4*n - 1),x)
```

```
[Out] int(F^(a + b*(c + d*x)^n)*(c + d*x)^(4*n - 1), x)
```

3.371 $\int F^{a+b(c+dx)^n}(c+dx)^{-1+3n}\,dx$

Optimal. Leaf size=100

$$\frac{2F^{a+b(c+dx)^n}}{b^3dn\log^3(F)}-\frac{2F^{a+b(c+dx)^n}(c+dx)^n}{b^2dn\log^2(F)}+\frac{F^{a+b(c+dx)^n}(c+dx)^{2n}}{bdn\log(F)}$$

```
[Out] 2*F^(a+b*(d*x+c)^n)/b^3/d/n/ln(F)^3-2*F^(a+b*(d*x+c)^n)*(d*x+c)^n/b^2/d/n/l
n(F)^2+F^(a+b*(d*x+c)^n)*(d*x+c)^(2*n)/b/d/n/ln(F)
```

Rubi [A]
time = 0.08, antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2244, 2240}

$$\frac{2F^{a+b(c+dx)^n}}{b^3dn\log^3(F)}-\frac{2(c+dx)^nF^{a+b(c+dx)^n}}{b^2dn\log^2(F)}+\frac{(c+dx)^{2n}F^{a+b(c+dx)^n}}{bdn\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 + 3*n),x]
```

```
[Out] (2*F^(a + b*(c + d*x)^n))/(b^3*d*n*Log[F]^3) - (2*F^(a + b*(c + d*x)^n)*(c
+ d*x)^n)/(b^2*d*n*Log[F]^2) + (F^(a + b*(c + d*x)^n)*(c + d*x)^(2*n))/(b*d
*n*Log[F])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2244

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^Simplify[m - n]*
F^(a + b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && Integer
Q[2*Simplify[(m + 1)/n]] && LtQ[0, Simplify[(m + 1)/n], 5] &&  !RationalQ[m
] && SumSimplerQ[m, -n]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)^{-1+3n}\,dx=\frac{F^{a+b(c+dx)^n}(c+dx)^{2n}}{bdn\log(F)}-\frac{2\int F^{a+b(c+dx)^n}(c+dx)^{-1+2n}\,dx}{b\log(F)}$$
$$=-\frac{2F^{a+b(c+dx)^n}(c+dx)^n}{b^2dn\log^2(F)}+\frac{F^{a+b(c+dx)^n}(c+dx)^{2n}}{bdn\log(F)}+\frac{2\int F^{a+b(c+dx)^n}(c+d}{b^2\log^2(F)}$$
$$=\frac{2F^{a+b(c+dx)^n}}{b^3dn\log^3(F)}-\frac{2F^{a+b(c+dx)^n}(c+dx)^n}{b^2dn\log^2(F)}+\frac{F^{a+b(c+dx)^n}(c+dx)^{2n}}{bdn\log(F)}$$

Mathematica [**C**] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.01, size = 31, normalized size = 0.31

$$\frac{F^a\Gamma(3,-b(c+dx)^n\log(F))}{b^3dn\log^3(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 + 3*n),x]
[Out] (F^a*Gamma[3, -(b*(c + d*x)^n*Log[F])])/(b^3*d*n*Log[F]^3)
```

Maple [**A**]
time = 0.06, size = 59, normalized size = 0.59

method	result	size
risch	$\frac{\left(b^2(dx+c)^{2n}\ln(F)^2-2b(dx+c)^n\ln(F)+2\right)F^{a+b(dx+c)^n}}{b^3\ln(F)^3nd}$	59

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+3*n),x,method=_RETURNVERBOSE)
[Out] (((d*x+c)^n)^2*b^2*ln(F)^2-2*b*(d*x+c)^n*ln(F)+2)/b^3/ln(F)^3/n/d*F^(a+b*(d
*x+c)^n)
```

Maxima [**A**]
time = 0.29, size = 66, normalized size = 0.66

$$\frac{\left((dx+c)^{2n}F^ab^2\log(F)^2-2\,(dx+c)^nF^ab\log(F)+2\,F^a\right)F^{(dx+c)^nb}}{b^3dn\log(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+3*n),x, algorithm="maxima")
```

[Out] ((d*x + c)^(2*n)*F^a*b^2*log(F)^2 - 2*(d*x + c)^n*F^a*b*log(F) + 2*F^a)*F^((d*x + c)^n*b)/(b^3*d*n*log(F)^3)

Fricas [A]
time = 0.36, size = 62, normalized size = 0.62

$$\frac{\left((dx+c)^{2n}b^2\log(F)^2-2(dx+c)^n b\log(F)+2\right)e^{\left((dx+c)^n b\log(F)+a\log(F)\right)}}{b^3dn\log(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+3*n),x, algorithm="fricas")
```

```
[Out] ((d*x + c)^(2*n)*b^2*log(F)^2 - 2*(d*x + c)^n*b*log(F) + 2)*e^((d*x + c)^n*b*log(F) + a*log(F))/(b^3*d*n*log(F)^3)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**(-1+3*n),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+3*n),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^(3*n - 1)*F^((d*x + c)^n*b + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int F^{a+b\,(c+d\,x)^n}\,(c+d\,x)^{3\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)*(c + d*x)^(3*n - 1),x)
```

```
[Out] int(F^(a + b*(c + d*x)^n)*(c + d*x)^(3*n - 1), x)
```

3.372 $\int F^{a+b(c+dx)^n}(c+dx)^{-1+2n}\,dx$

Optimal. Leaf size=63

$$-\frac{F^{a+b(c+dx)^n}}{b^2dn\log^2(F)}+\frac{F^{a+b(c+dx)^n}(c+dx)^n}{bdn\log(F)}$$

```
[Out] -F^(a+b*(d*x+c)^n)/b^2/d/n/ln(F)^2+F^(a+b*(d*x+c)^n)*(d*x+c)^n/b/d/n/ln(F)
```

Rubi [A]
time = 0.05, antiderivative size = 63, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}=0.080$, Rules used = {2244, 2240}

$$\frac{(c+dx)^nF^{a+b(c+dx)^n}}{bdn\log(F)}-\frac{F^{a+b(c+dx)^n}}{b^2dn\log^2(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 + 2*n),x]
```

```
[Out] -(F^(a + b*(c + d*x)^n)/(b^2*d*n*Log[F]^2)) + (F^(a + b*(c + d*x)^n)*(c + d
*x)^n)/(b*d*n*Log[F])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2244

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^Simplify[m - n]*
F^(a + b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && Integer
Q[2*Simplify[(m + 1)/n]] && LtQ[0, Simplify[(m + 1)/n], 5] &&  !RationalQ[m
] && SumSimplerQ[m, -n]
```

Rubi steps

$$\begin{aligned}\int F^{a+b(c+dx)^n}(c+dx)^{-1+2n}\,dx&=\frac{F^{a+b(c+dx)^n}(c+dx)^n}{bdn\log(F)}-\frac{\int F^{a+b(c+dx)^n}(c+dx)^{-1+n}\,dx}{b\log(F)}\\&=-\frac{F^{a+b(c+dx)^n}}{b^2dn\log^2(F)}+\frac{F^{a+b(c+dx)^n}(c+dx)^n}{bdn\log(F)}\end{aligned}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.01, size = 32, normalized size = 0.51

$$-\frac{F^a\Gamma(2,-b(c+dx)^n\log(F))}{b^2dn\log^2(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 + 2*n),x]
[Out] -((F^a*Gamma[2, -(b*(c + d*x)^n*Log[F])])/(b^2*d*n*Log[F]^2))
```

Maple [A]
time = 0.07, size = 41, normalized size = 0.65

method	result	size
risch	$\frac{(b(dx+c)^n\ln(F)-1)F^{a+b(dx+c)^n}}{b^2nd\ln(F)^2}$	41
norman	$\frac{e^{n\ln(dx+c)}e^{\left(a+b\,e^{n\ln(dx+c)}\right)\ln(F)}}{dbn\ln(F)}-\frac{e^{\left(a+b\,e^{n\ln(dx+c)}\right)\ln(F)}}{b^2nd\ln(F)^2}$	74

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+2*n),x,method=_RETURNVERBOSE)
[Out] (b*(d*x+c)^n*ln(F)-1)/b^2/n/d/ln(F)^2*F^(a+b*(d*x+c)^n)
```

Maxima [A]
time = 0.31, size = 45, normalized size = 0.71

$$\frac{((dx+c)^nF^ab\log(F)-F^a)F^{(dx+c)^nb}}{b^2dn\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+2*n),x, algorithm="maxima")
[Out] ((d*x + c)^n*F^a*b*log(F) - F^a)*F^((d*x + c)^n*b)/(b^2*d*n*log(F)^2)
```

Fricas [A]
time = 0.36, size = 44, normalized size = 0.70

$$\frac{((dx+c)^nb\log(F)-1)e^{((dx+c)^nb\log(F)+a\log(F))}}{b^2dn\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+2*n),x, algorithm="fricas")
```

[Out] ((d*x + c)^n*b*log(F) - 1)*e^((d*x + c)^n*b*log(F) + a*log(F))/(b^2*d*n*log(F)^2)

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**(-1+2*n),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+2*n),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^(2*n - 1)*F^((d*x + c)^n*b + a), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.02

$$\int F^{a+b\,{\left(c+d\,x\right)}^n}\,{\left(c+d\,x\right)}^{2\,n-1} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)*(c + d*x)^(2*n - 1),x)
```

```
[Out] int(F^(a + b*(c + d*x)^n)*(c + d*x)^(2*n - 1), x)
```

3.373 $\int F^{a+b(c+dx)^n}(c+dx)^{-1+n}\,dx$

Optimal. Leaf size=27

$$\frac{F^{a+b(c+dx)^n}}{bdn\log(F)}$$

[Out] F^(a+b*(d*x+c)^n)/b/d/n/ln(F)

Rubi [A]
time = 0.02, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.043$, Rules used = {2240}

$$\frac{F^{a+b(c+dx)^n}}{bdn\log(F)}$$

Antiderivative was successfully verified.

[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 + n),x]

[Out] F^(a + b*(c + d*x)^n)/(b*d*n*Log[F])

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)^{-1+n}\,dx = \frac{F^{a+b(c+dx)^n}}{bdn\log(F)}$$

Mathematica [A]
time = 0.01, size = 27, normalized size = 1.00

$$\frac{F^{a+b(c+dx)^n}}{bdn\log(F)}$$

Antiderivative was successfully verified.

[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 + n),x]

[Out] F^(a + b*(c + d*x)^n)/(b*d*n*Log[F])

Maple [A]
time = 0.06, size = 28, normalized size = 1.04

method	result	size
risch	$\frac{F^{a+b(dx+c)^n}}{bdn\ln(F)}$	28
norman	$\frac{e^{\left(a+b\,e^{n\ln(dx+c)}\right)\ln(F)}}{dbn\ln(F)}$	32

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+n),x,method=_RETURNVERBOSE)
```

```
[Out] F^(a+b*(d*x+c)^n)/b/d/n/ln(F)
```

Maxima [A]
time = 0.28, size = 27, normalized size = 1.00

$$\frac{F^{(dx+c)^n b+a}}{bdn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+n),x, algorithm="maxima")
```

```
[Out] F^((d*x + c)^n*b + a)/(b*d*n*log(F))
```

Fricas [A]
time = 0.38, size = 31, normalized size = 1.15

$$\frac{e^{((dx+c)^n b\log(F)+a\log(F))}}{bdn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+n),x, algorithm="fricas")
```

```
[Out] e^((d*x + c)^n*b*log(F) + a*log(F))/(b*d*n*log(F))
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**(-1+n),x)
```

```
[Out] Timed out
```

Giac [A]
time = 3.08, size = 27, normalized size = 1.00

$$\frac{F^{(dx+c)^n b+a}}{bdn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+n),x, algorithm="giac")
[Out] F^((d*x + c)^n*b + a)/(b*d*n*log(F))
```

Mupad [B]
time = 3.68, size = 27, normalized size = 1.00

$$\frac{F^{a+b\,(c+d\,x)^n}}{b\,d\,n\,\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)*(c + d*x)^(n - 1),x)
[Out] F^(a + b*(c + d*x)^n)/(b*d*n*log(F))
```

3.374 $\int \frac{F^{a+b(c+dx)^n}}{c+dx}\,dx$

Optimal. Leaf size=22

$$\frac{F^a\text{Ei}(b(c+dx)^n\log(F))}{dn}$$

[Out] F^a*Ei(b*(d*x+c)^n*ln(F))/d/n

Rubi [A]
time = 0.02, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2241}

$$\frac{F^a\text{Ei}(b(c+dx)^n\log(F))}{dn}$$

Antiderivative was successfully verified.

[In] Int[F^(a + b*(c + d*x)^n)/(c + d*x),x]

[Out] (F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(d*n)

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^n}}{c+dx}\,dx = \frac{F^a\text{Ei}(b(c+dx)^n\log(F))}{dn}$$

Mathematica [A]
time = 0.00, size = 22, normalized size = 1.00

$$\frac{F^a\text{Ei}(b(c+dx)^n\log(F))}{dn}$$

Antiderivative was successfully verified.

[In] Integrate[F^(a + b*(c + d*x)^n)/(c + d*x),x]

[Out] (F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(d*n)

Maple [A]
time = 0.00, size = 26, normalized size = 1.18

method	result	size
risch	$-\frac{F^{a} \operatorname{expIntegral}(1,-b(dx+c)^{n} \ln(F))}{dn}$	26

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^n)/(d*x+c),x,method=_RETURNVERBOSE)
```

```
[Out] -1/d/n*F^a*Ei(1,-b*(d*x+c)^n*ln(F))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c),x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^n*b + a)/(d*x + c), x)
```

Fricas [A]
time = 0.38, size = 22, normalized size = 1.00

$$\frac{F^{a}\operatorname{Ei}\left((dx+c)^{n}b\log\left(F\right)\right)}{dn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c),x, algorithm="fricas")
```

```
[Out] F^a*Ei((d*x + c)^n*b*log(F))/(d*n)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^{n}}}{c+dx}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)/(d*x+c),x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**n)/(c + d*x), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c),x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^n*b + a)/(d*x + c), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{F^a\,F^{b\,{\left(c+d\,x\right)}^n}}{c+d\,x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)/(c + d*x),x)
```

```
[Out] int((F^a*F^(b*(c + d*x)^n))/(c + d*x), x)
```

3.375 $\int F^{a+b(c+dx)^n}(c+dx)^{-1-n}\,dx$

Optimal. Leaf size=56

$$-\frac{F^{a+b(c+dx)^n}(c+dx)^{-n}}{dn}+\frac{bF^a\text{Ei}(b(c+dx)^n\log(F))\log(F)}{dn}$$

```
[Out] -F^(a+b*(d*x+c)^n)/d/n/((d*x+c)^n)+b*F^a*Ei(b*(d*x+c)^n*ln(F))*ln(F)/d/n
```

Rubi [A]
time = 0.05, antiderivative size = 56, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2246, 2241}

$$\frac{bF^a\log(F)\text{Ei}(b(c+dx)^n\log(F))}{dn}-\frac{(c+dx)^{-n}F^{a+b(c+dx)^n}}{dn}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 - n),x]
```

```
[Out] -(F^(a + b*(c + d*x)^n)/(d*n*(c + d*x)^n)) + (b*F^a*ExpIntegralEi[b*(c + d*
x)^n*Log[F]]*Log[F])/(d*n)
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2246

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^Simplify[m + n]*F^(a + b*(c
 + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && IntegerQ[2*Simplif
y[(m + 1)/n]] && LtQ[-4, Simplify[(m + 1)/n], 5] &&  !RationalQ[m] && SumSi
mplerQ[m, n]
```

Rubi steps

$$\begin{aligned}\int F^{a+b(c+dx)^n}(c+dx)^{-1-n}\,dx&=-\frac{F^{a+b(c+dx)^n}(c+dx)^{-n}}{dn}+(b\log(F))\int\frac{F^{a+b(c+dx)^n}}{c+dx}\,dx\\&=-\frac{F^{a+b(c+dx)^n}(c+dx)^{-n}}{dn}+\frac{bF^a\text{Ei}(b(c+dx)^n\log(F))\log(F)}{dn}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 27, normalized size = 0.48

$$\frac{bF^a\Gamma(-1,-b(c+dx)^n\log(F))\log(F)}{dn}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 - n),x]
```

```
[Out] (b*F^a*Gamma[-1, -(b*(c + d*x)^n*Log[F])]*Log[F])/(d*n)
```

Maple [A]
time = 0.12, size = 61, normalized size = 1.09

method	result	size
risch	$-\frac{F^{b(dx+c)^n}F^a(dx+c)^{-n}}{nd}-\frac{\ln(F)bF^a\,\mathrm{expIntegral}(1,-b(dx+c)^n\ln(F))}{nd}$	61

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-n),x,method=_RETURNVERBOSE)
```

```
[Out] -1/n/d*F^(b*(d*x+c)^n)*F^a/((d*x+c)^n)-1/n/d*ln(F)*b*F^a*Ei(1,-b*(d*x+c)^n*
ln(F))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-n),x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^(-n - 1)*F^((d*x + c)^n*b + a), x)
```

Fricas [A]
time = 0.38, size = 62, normalized size = 1.11

$$\frac{(dx+c)^nF^ab\mathrm{Ei}((dx+c)^nb\log(F))\log(F)-e^{((dx+c)^nb\log(F)+a\log(F))}}{(dx+c)^ndn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-n),x, algorithm="fricas")
```

```
[Out] ((d*x + c)^n*F^a*b*Ei((d*x + c)^n*b*log(F))*log(F) - e^((d*x + c)^n*b*log(F
) + a*log(F)))/((d*x + c)^n*d*n)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**(-1-n),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-n),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^(-n - 1)*F^((d*x + c)^n*b + a), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{F^{a+b\,(c+d\,x)^n}}{(c+d\,x)^{n+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)/(c + d*x)^(n + 1),x)
```

```
[Out] int(F^(a + b*(c + d*x)^n)/(c + d*x)^(n + 1), x)
```

3.376 $\int F^{a+b(c+dx)^n}(c+dx)^{-1-2n}\,dx$

Optimal. Leaf size=100

$$-\frac{F^{a+b(c+dx)^n}(c+dx)^{-2n}}{2dn}-\frac{bF^{a+b(c+dx)^n}(c+dx)^{-n}\log(F)}{2dn}+\frac{b^2F^a\text{Ei}(b(c+dx)^n\log(F))\log^2(F)}{2dn}$$

```
[Out] -1/2*F^(a+b*(d*x+c)^n)/d/n/((d*x+c)^(2*n))-1/2*b*F^(a+b*(d*x+c)^n)*ln(F)/d/
n/((d*x+c)^n)+1/2*b^2*F^a*Ei(b*(d*x+c)^n*ln(F))*ln(F)^2/d/n
```

Rubi [A]
time = 0.08, antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.080$, Rules used = {2246, 2241}

$$\frac{b^2F^a\log^2(F)\text{Ei}(b(c+dx)^n\log(F))}{2dn}-\frac{(c+dx)^{-2n}F^{a+b(c+dx)^n}}{2dn}-\frac{b\log(F)(c+dx)^{-n}F^{a+b(c+dx)^n}}{2dn}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 - 2*n),x]
```

```
[Out] -1/2*F^(a + b*(c + d*x)^n)/(d*n*(c + d*x)^(2*n)) - (b*F^(a + b*(c + d*x)^n)
*Log[F])/(2*d*n*(c + d*x)^n) + (b^2*F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]]
*Log[F]^2)/(2*d*n)
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2246

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^Simplify[m + n]*F^(a + b*(c
 + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && IntegerQ[2*Simplif
y[(m + 1)/n]] && LtQ[-4, Simplify[(m + 1)/n], 5] &&  !RationalQ[m] && SumSi
mplerQ[m, n]
```

Rubi steps

$$\begin{aligned}\int F^{a+b(c+dx)^n}(c+dx)^{-1-2n}\,dx &= -\frac{F^{a+b(c+dx)^n}(c+dx)^{-2n}}{2dn}+\frac{1}{2}(b\log(F))\int F^{a+b(c+dx)^n}(c+dx)^{-1-n}\,dx \\ &= -\frac{F^{a+b(c+dx)^n}(c+dx)^{-2n}}{2dn}-\frac{bF^{a+b(c+dx)^n}(c+dx)^{-n}\log(F)}{2dn}+\frac{1}{2}(b^2\log^2(F) \\ &= -\frac{F^{a+b(c+dx)^n}(c+dx)^{-2n}}{2dn}-\frac{bF^{a+b(c+dx)^n}(c+dx)^{-n}\log(F)}{2dn}+\frac{b^2F^a\mathrm{Ei}(b(c+}{}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 32, normalized size = 0.32

$$-\frac{b^2F^a\Gamma(-2,-b(c+dx)^n\log(F))\log^2(F)}{dn}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 - 2*n),x]
```

```
[Out] -((b^2*F^a*Gamma[-2, -(b*(c + d*x)^n*Log[F])]*Log[F]^2)/(d*n))
```

Maple [A]
time = 0.10, size = 99, normalized size = 0.99

method	result	size
risch	$-\frac{F^{b(dx+c)^n}F^a(dx+c)^{-2n}}{2nd}-\frac{\ln(F)b\,F^{b(dx+c)^n}F^a(dx+c)^{-n}}{2nd}-\frac{\ln(F)^2b^2F^a\,\mathrm{expIntegral}(1,-b(dx+c)^n\ln(F))}{2nd}$	99

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-2*n),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2/n/d*F^(b*(d*x+c)^n)*F^a/((d*x+c)^n)^2-1/2/n/d*ln(F)*b*F^(b*(d*x+c)^n)*
F^a/((d*x+c)^n)-1/2/n/d*ln(F)^2*b^2*F^a*Ei(1,-b*(d*x+c)^n*ln(F))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-2*n),x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^(-2*n - 1)*F^((d*x + c)^n*b + a), x)
```

Fricas [A]
time = 0.38, size = 84, normalized size = 0.84

$$\frac{(dx+c)^{2\,n}F^a b^2 \mathrm{Ei}\big((dx+c)^n b\log(F)\big)\log(F)^2 - \big((dx+c)^n b\log(F)+1\big)e^{\left((dx+c)^n b\log(F)+a\log(F)\right)}}{2\,(dx+c)^{2\,n}dn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-2*n),x, algorithm="fricas")
[Out] 1/2*((d*x + c)^(2*n)*F^a*b^2*Ei((d*x + c)^n*b*log(F))*log(F)^2 - ((d*x + c)
^n*b*log(F) + 1)*e^((d*x + c)^n*b*log(F) + a*log(F)))/((d*x + c)^(2*n)*d*n)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**(-1-2*n),x)
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-2*n),x, algorithm="giac")
[Out] integrate((d*x + c)^(-2*n - 1)*F^((d*x + c)^n*b + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{F^{a+b\,{(c+d\,x)}^n}}{{(c+d\,x)}^{2\,n+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)/(c + d*x)^(2*n + 1),x)
[Out] int(F^(a + b*(c + d*x)^n)/(c + d*x)^(2*n + 1), x)
```

3.377 $\int F^{a+b(c+dx)^n}(c+dx)^{-1-3n}\,dx$

Optimal. Leaf size=139

$$-\frac{F^{a+b(c+dx)^n}(c+dx)^{-3n}}{3dn}-\frac{bF^{a+b(c+dx)^n}(c+dx)^{-2n}\log(F)}{6dn}-\frac{b^2F^{a+b(c+dx)^n}(c+dx)^{-n}\log^2(F)}{6dn}+\frac{b^3F^a\mathrm{Ei}(b(c+$$

```
[Out] -1/3*F^(a+b*(d*x+c)^n)/d/n/((d*x+c)^(3*n))-1/6*b*F^(a+b*(d*x+c)^n)*ln(F)/d/
n/((d*x+c)^(2*n))-1/6*b^2*F^(a+b*(d*x+c)^n)*ln(F)^2/d/n/((d*x+c)^n)+1/6*b^3
*F^a*Ei(b*(d*x+c)^n*ln(F))*ln(F)^3/d/n
```

Rubi [A]
time = 0.11, antiderivative size = 139, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.080$, Rules used = $\{2246, 2241\}$

$$\frac{b^3F^a\log^3(F)\mathrm{Ei}(b(c+dx)^n\log(F))}{6dn}-\frac{b^2\log^2(F)(c+dx)^{-n}F^{a+b(c+dx)^n}}{6dn}-\frac{(c+dx)^{-3n}F^{a+b(c+dx)^n}}{3dn}-\frac{b\log(F)(c+dx)^{-2n}F^{a+b(c+dx)^n}}{6dn}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 - 3*n),x]
```

```
[Out] -1/3*F^(a + b*(c + d*x)^n)/(d*n*(c + d*x)^(3*n)) - (b*F^(a + b*(c + d*x)^n)
*Log[F])/(6*d*n*(c + d*x)^(2*n)) - (b^2*F^(a + b*(c + d*x)^n)*Log[F]^2)/(6*
d*n*(c + d*x)^n) + (b^3*F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]]*Log[F]^3)/(
6*d*n)
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2246

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^Simplify[m + n]*F^(a + b*(c
 + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && IntegerQ[2*Simplif
y[(m + 1)/n]] && LtQ[-4, Simplify[(m + 1)/n], 5] &&  !RationalQ[m] && SumSi
mplerQ[m, n]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)^{-1-3n}\,dx = -\frac{F^{a+b(c+dx)^n}(c+dx)^{-3n}}{3dn} + \frac{1}{3}(b\log(F))\int F^{a+b(c+dx)^n}(c+dx)^{-1-2n}\,dx$$
$$= -\frac{F^{a+b(c+dx)^n}(c+dx)^{-3n}}{3dn} - \frac{bF^{a+b(c+dx)^n}(c+dx)^{-2n}\log(F)}{6dn} + \frac{1}{6}(b^2\log^2(F$$
$$= -\frac{F^{a+b(c+dx)^n}(c+dx)^{-3n}}{3dn} - \frac{bF^{a+b(c+dx)^n}(c+dx)^{-2n}\log(F)}{6dn} - \frac{b^2F^{a+b(c+d}}{}$$
$$= -\frac{F^{a+b(c+dx)^n}(c+dx)^{-3n}}{3dn} - \frac{bF^{a+b(c+dx)^n}(c+dx)^{-2n}\log(F)}{6dn} - \frac{b^2F^{a+b(c+d}}{}$$

Mathematica [A]
time = 0.01, size = 31, normalized size = 0.22

$$\frac{b^3F^a\Gamma(-3,-b(c+dx)^n\log(F))\log^3(F)}{dn}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 - 3*n),x]
```

```
[Out] (b^3*F^a*Gamma[-3, -(b*(c + d*x)^n*Log[F])]*Log[F]^3)/(d*n)
```

Maple [A]
time = 0.10, size = 137, normalized size = 0.99

method	result
risch	$-\frac{F^{b(dx+c)^n}F^a(dx+c)^{-3n}}{3nd} - \frac{\ln(F)b\,F^{b(dx+c)^n}F^a(dx+c)^{-2n}}{6nd} - \frac{\ln(F)^2b^2F^{b(dx+c)^n}F^a(dx+c)^{-n}}{6nd} - \frac{\ln(F)^3b^3F^a\,\mathrm{expIntegral}(1}{6nd}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-3*n),x,method=_RETURNVERBOSE)
```

```
[Out] -1/3/n/d*F^(b*(d*x+c)^n)*F^a/((d*x+c)^n)^3-1/6/n/d*ln(F)*b*F^(b*(d*x+c)^n)*
F^a/((d*x+c)^n)^2-1/6/n/d*ln(F)^2*b^2*F^(b*(d*x+c)^n)*F^a/((d*x+c)^n)-1/6/n
/d*ln(F)^3*b^3*F^a*Ei(1,-b*(d*x+c)^n*ln(F))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-3*n),x, algorithm="maxima")
```

[Out] integrate((d*x + c)^(-3*n - 1)*F^((d*x + c)^n*b + a), x)

Fricas [A]
time = 0.39, size = 101, normalized size = 0.73

$$\frac{(dx+c)^{3n}F^a b^3 \mathrm{Ei}\left((dx+c)^n b\log(F)\right)\log(F)^3 - \left((dx+c)^{2n}b^2\log(F)^2 + (dx+c)^n b\log(F) + 2\right)e^{\left((dx+c)^n b\log(F) + a\log(F)\right)}}{6\,(dx+c)^{3n}dn}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-3*n),x, algorithm="fricas")

[Out] 1/6*((d*x + c)^(3*n)*F^a*b^3*Ei((d*x + c)^n*b*log(F))*log(F)^3 - ((d*x + c)^(2*n)*b^2*log(F)^2 + (d*x + c)^n*b*log(F) + 2)*e^((d*x + c)^n*b*log(F) + a*log(F)))/((d*x + c)^(3*n)*d*n)

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**(-1-3*n),x)

[Out] Exception raised: SystemError >> excessive stack use: stack is 3005 deep

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-3*n),x, algorithm="giac")

[Out] integrate((d*x + c)^(-3*n - 1)*F^((d*x + c)^n*b + a), x)

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{F^{a+b\,(c+d\,x)^n}}{(c+d\,x)^{3\,n+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a + b*(c + d*x)^n)/(c + d*x)^(3*n + 1),x)

[Out] int(F^(a + b*(c + d*x)^n)/(c + d*x)^(3*n + 1), x)

3.378 $\int F^{a+b(c+dx)^n}(c+dx)^{-1-4n}\,dx$

Optimal. Leaf size=32

$$-\frac{b^4F^a\Gamma(-4,-b(c+dx)^n\log(F))\log^4(F)}{dn}$$

```
[Out] -F^a/((d*x+c)^n)^4*Ei(5,-b*(d*x+c)^n*ln(F))/d/n
```

Rubi [A]
time = 0.03, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.040$, Rules used = {2250}

$$-\frac{b^4F^a\log^4(F)\text{Gamma}(-4,-b\log(F)(c+dx)^n)}{dn}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 - 4*n),x]
```

```
[Out] -((b^4*F^a*Gamma[-4, -(b*(c + d*x)^n*Log[F])]*Log[F]^4)/(d*n))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)^{-1-4n}\,dx = -\frac{b^4F^a\Gamma(-4,-b(c+dx)^n\log(F))\log^4(F)}{dn}$$

Mathematica [A]
time = 0.01, size = 32, normalized size = 1.00

$$-\frac{b^4F^a\Gamma(-4,-b(c+dx)^n\log(F))\log^4(F)}{dn}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 - 4*n),x]
```

```
[Out] -((b^4*F^a*Gamma[-4, -(b*(c + d*x)^n*Log[F])]*Log[F]^4)/(d*n))
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 174 vs. $2(34) = 68$.
time = 0.10, size = 175, normalized size = 5.47

method	result
risch	$-\frac{F^{b(dx+c)^n} F^a (dx+c)^{-4n}}{4nd} - \frac{\ln(F) b F^{b(dx+c)^n} F^a (dx+c)^{-3n}}{12nd} - \frac{\ln(F)^2 b^2 F^{b(dx+c)^n} F^a (dx+c)^{-2n}}{24nd} - \frac{\ln(F)^3 b^3 F^{b(dx+c)^n} F^a (dx\cdot}{24nd}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-4*n),x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/n/d*F^(b*(d*x+c)^n)*F^a/((d*x+c)^n)^4-1/12/n/d*ln(F)*b*F^(b*(d*x+c)^n)
*F^a/((d*x+c)^n)^3-1/24/n/d*ln(F)^2*b^2*F^(b*(d*x+c)^n)*F^a/((d*x+c)^n)^2-1
/24/n/d*ln(F)^3*b^3*F^(b*(d*x+c)^n)*F^a/((d*x+c)^n)-1/24/n/d*ln(F)^4*b^4*F^
a*Ei(1,-b*(d*x+c)^n*ln(F))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-4*n),x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^(-4*n - 1)*F^((d*x + c)^n*b + a), x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 119 vs. $2(36) = 72$.
time = 0.11, size = 119, normalized size = 3.72

$$\frac{(dx+c)^{4n} F^a b^4 \text{Ei}\left((dx+c)^n b \log(F)\right) \log(F)^4 - \left((dx+c)^{3n} b^3 \log(F)^3 + (dx+c)^{2n} b^2 \log(F)^2 + 2\,(dx+c)^n b \log(F) + 6\right) e^{\left((dx+c)^n b \log(F) + a \log(F)\right)}}{24\,(dx+c)^{4n} dn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-4*n),x, algorithm="fricas")
```

```
[Out] 1/24*((d*x + c)^(4*n)*F^a*b^4*Ei((d*x + c)^n*b*log(F))*log(F)^4 - ((d*x + c
)^(3*n)*b^3*log(F)^3 + (d*x + c)^(2*n)*b^2*log(F)^2 + 2*(d*x + c)^n*b*log(F
) + 6)*e^((d*x + c)^n*b*log(F) + a*log(F)))/((d*x + c)^(4*n)*d*n)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**(-1-4*n),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-4*n),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^(-4*n - 1)*F^((d*x + c)^n*b + a), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{F^{a+b\,(c+d\,x)^n}}{(c+d\,x)^{4\,n+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)/(c + d*x)^(4*n + 1),x)
```

```
[Out] int(F^(a + b*(c + d*x)^n)/(c + d*x)^(4*n + 1), x)
```

3.379 $\int F^{a+b(c+dx)^n}(c+dx)^{-1-5n}\,dx$

Optimal. Leaf size=31

$$\frac{b^5F^a\Gamma(-5,-b(c+dx)^n\log(F))\log^5(F)}{dn}$$

```
[Out] -F^a/((d*x+c)^n)^5*Ei(6,-b*(d*x+c)^n*ln(F))/d/n
```

Rubi [A]
time = 0.03, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.040$, Rules used = {2250}

$$\frac{b^5F^a\log^5(F)\text{Gamma}(-5,-b\log(F)(c+dx)^n)}{dn}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 - 5*n),x]
```

```
[Out] (b^5*F^a*Gamma[-5, -(b*(c + d*x)^n*Log[F])]*Log[F]^5)/(d*n)
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)^{-1-5n}\,dx=\frac{b^5F^a\Gamma(-5,-b(c+dx)^n\log(F))\log^5(F)}{dn}$$

Mathematica [A]
time = 0.01, size = 31, normalized size = 1.00

$$\frac{b^5F^a\Gamma(-5,-b(c+dx)^n\log(F))\log^5(F)}{dn}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 - 5*n),x]
```

```
[Out] (b^5*F^a*Gamma[-5, -(b*(c + d*x)^n*Log[F])]*Log[F]^5)/(d*n)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 212 vs. $2(34) = 68$.
time = 0.11, size = 213, normalized size = 6.87

method	result
risch	$-\frac{F^{b(dx+c)^n} F^a (dx+c)^{-5n}}{5nd} - \frac{\ln(F) b F^{b(dx+c)^n} F^a (dx+c)^{-4n}}{20nd} - \frac{\ln(F)^2 b^2 F^{b(dx+c)^n} F^a (dx+c)^{-3n}}{60nd} - \frac{\ln(F)^3 b^3 F^{b(dx+c)^n} F^a (d}{120nd}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-5*n),x,method=_RETURNVERBOSE)
```

```
[Out] -1/5/n/d*F^(b*(d*x+c)^n)*F^a/((d*x+c)^n)^5-1/20/n/d*ln(F)*b*F^(b*(d*x+c)^n)
*F^a/((d*x+c)^n)^4-1/60/n/d*ln(F)^2*b^2*F^(b*(d*x+c)^n)*F^a/((d*x+c)^n)^3-1
/120/n/d*ln(F)^3*b^3*F^(b*(d*x+c)^n)*F^a/((d*x+c)^n)^2-1/120/n/d*ln(F)^4*b^
4*F^(b*(d*x+c)^n)*F^a/((d*x+c)^n)-1/120/n/d*ln(F)^5*b^5*F^a*Ei(1,-b*(d*x+c)
^n*ln(F))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-5*n),x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^(-5*n - 1)*F^((d*x + c)^n*b + a), x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 137 vs. $2(36) = 72$.
time = 0.10, size = 137, normalized size = 4.42

$$\frac{(dx+c)^{5n} F^a b^5 \mathrm{Ei}\left((dx+c)^n b \log(F)\right) \log(F)^5 - \left((dx+c)^{4n} b^4 \log(F)^4 + (dx+c)^{3n} b^3 \log(F)^3 + 2\,(dx+c)^{2n} b^2 \log(F)^2 + 6\,(dx+c)^n b \log(F) + 24\right) e^{\left((dx+c)^n b \log(F) + a \log(F)\right)}}{120\,(dx+c)^{5n} dn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-5*n),x, algorithm="fricas")
```

```
[Out] 1/120*((d*x + c)^(5*n)*F^a*b^5*Ei((d*x + c)^n*b*log(F))*log(F)^5 - ((d*x +
c)^(4*n)*b^4*log(F)^4 + (d*x + c)^(3*n)*b^3*log(F)^3 + 2*(d*x + c)^(2*n)*b^
2*log(F)^2 + 6*(d*x + c)^n*b*log(F) + 24)*e^((d*x + c)^n*b*log(F) + a*log(F
)))/((d*x + c)^(5*n)*d*n)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**(-1-5*n),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-5*n),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^(-5*n - 1)*F^((d*x + c)^n*b + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{F^{a+b\,(c+d\,x)^n}}{{(c+d\,x)}^{5\,n+1}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)/(c + d*x)^(5*n + 1),x)
```

```
[Out] int(F^(a + b*(c + d*x)^n)/(c + d*x)^(5*n + 1), x)
```

3.380 $\int F^{c(a+bx)^n}(a+bx)^{-1+\frac{n}{2}}\,dx$

Optimal. Leaf size=47

$$\frac{\sqrt{\pi}\,\text{erfi}\left(\sqrt{c}\,(a+bx)^{n/2}\sqrt{\log(F)}\right)}{b\sqrt{c}\,n\sqrt{\log(F)}}$$

[Out] erfi((b*x+a)^(1/2*n)*c^(1/2)*ln(F)^(1/2))*Pi^(1/2)/b/n/c^(1/2)/ln(F)^(1/2)

Rubi [A]
time = 0.03, antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2242, 2235}

$$\frac{\sqrt{\pi}\,\text{Erfi}\left(\sqrt{c}\,\sqrt{\log(F)}\,(a+bx)^{n/2}\right)}{b\sqrt{c}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

[In] Int[F^(c*(a + b*x)^n)*(a + b*x)^(-1 + n/2),x]

[Out] (Sqrt[Pi]*Erfi[Sqrt[c]*(a + b*x)^(n/2)*Sqrt[Log[F]]])/(b*Sqrt[c]*n*Sqrt[Log[F]])

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rubi steps

$$\begin{aligned}\int F^{c(a+bx)^n}(a+bx)^{-1+\frac{n}{2}}\,dx &= \frac{2\text{Subst}\left(\int F^{cx^2}\,dx, x, (a+bx)^{n/2}\right)}{bn}\\ &= \frac{\sqrt{\pi}\,\text{erfi}\left(\sqrt{c}\,(a+bx)^{n/2}\sqrt{\log(F)}\right)}{b\sqrt{c}\,n\sqrt{\log(F)}}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 47, normalized size = 1.00

$$\frac{\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{c}\,(a+bx)^{n/2}\sqrt{\log(F)}\right)}{b\sqrt{c}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(c*(a + b*x)^n)*(a + b*x)^(-1 + n/2),x]
```

```
[Out] (Sqrt[Pi]*Erfi[Sqrt[c]*(a + b*x)^(n/2)*Sqrt[Log[F]]])/(b*Sqrt[c]*n*Sqrt[Log
[F]])
```

Maple [A]
time = 0.14, size = 36, normalized size = 0.77

method	result	size
risch	$\frac{\sqrt{\pi}\,\mathrm{erf}\left(\sqrt{-c\ln(F)}\,(bx+a)^{\frac{n}{2}}\right)}{nb\sqrt{-c\ln(F)}}$	36

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(c*(b*x+a)^n)*(b*x+a)^(-1+1/2*n),x,method=_RETURNVERBOSE)
```

```
[Out] 1/n/b*Pi^(1/2)/(-c*ln(F))^(1/2)*erf((-c*ln(F))^(1/2)*(b*x+a)^(1/2*n))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(c*(b*x+a)^n)*(b*x+a)^(-1+1/2*n),x, algorithm="maxima")
```

```
[Out] integrate((b*x + a)^(1/2*n - 1)*F^((b*x + a)^n*c), x)
```

Fricas [A]
time = 0.38, size = 50, normalized size = 1.06

$$-\frac{\sqrt{\pi}\,\sqrt{-c\log(F)}\,\mathrm{erf}\left((bx+a)\sqrt{-c\log(F)}\,(bx+a)^{\frac{1}{2}n-1}\right)}{bcn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(c*(b*x+a)^n)*(b*x+a)^(-1+1/2*n),x, algorithm="fricas")
```

```
[Out] -sqrt(pi)*sqrt(-c*log(F))*erf((b*x + a)*sqrt(-c*log(F))*(b*x + a)^(1/2*n -
1))/(b*c*n*log(F))
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{c(a+bx)^n}(a+bx)^{\frac{n}{2}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(c*(b*x+a)**n)*(b*x+a)**(-1+1/2*n),x)
```

```
[Out] Integral(F**(c*(a + b*x)**n)*(a + b*x)**(n/2 - 1), x)
```

Giac [A]
time = 2.44, size = 37, normalized size = 0.79

$$-\frac{\sqrt{\pi}\,\operatorname{erf}\left(-\sqrt{-c\log\left(F\right)}\,\sqrt{(bx+a)^n}\right)}{\sqrt{-c\log\left(F\right)}\,bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(c*(b*x+a)^n)*(b*x+a)^(-1+1/2*n),x, algorithm="giac")
```

```
[Out] -sqrt(pi)*erf(-sqrt(-c*log(F))*sqrt((b*x + a)^n))/(sqrt(-c*log(F))*b*n)
```

Mupad [B]
time = 3.95, size = 39, normalized size = 0.83

$$-\frac{\sqrt{\pi}\,\operatorname{erf}\left(\sqrt{c}\,\sqrt{\ln\left(F\right)}\,\left(a+b\,x\right)^{n/2}\,1\mathrm{i}\right)\,1\mathrm{i}}{b\,\sqrt{c}\,n\,\sqrt{\ln\left(F\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(c*(a + b*x)^n)*(a + b*x)^(n/2 - 1),x)
```

```
[Out] -(pi^(1/2)*erf(c^(1/2)*log(F)^(1/2)*(a + b*x)^(n/2)*1i)*1i)/(b*c^(1/2)*n*lo
g(F)^(1/2))
```

3.381 $\int F^{-c(a+bx)^n}(a+bx)^{-1+\frac{n}{2}}\,dx$

Optimal. Leaf size=47

$$\frac{\sqrt{\pi}\,\mathrm{erf}\left(\sqrt{c}\,(a+bx)^{n/2}\sqrt{\log(F)}\right)}{b\sqrt{c}\,n\sqrt{\log(F)}}$$

```
[Out] erf((b*x+a)^(1/2*n)*c^(1/2)*ln(F)^(1/2))*Pi^(1/2)/b/n/c^(1/2)/ln(F)^(1/2)
```

Rubi [A]
time = 0.03, antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2242, 2236}

$$\frac{\sqrt{\pi}\,\mathrm{Erf}\left(\sqrt{c}\,\sqrt{\log(F)}\,(a+bx)^{n/2}\right)}{b\sqrt{c}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^(-1 + n/2)/F^(c*(a + b*x)^n),x]
```

```
[Out] (Sqrt[Pi]*Erf[Sqrt[c]*(a + b*x)^(n/2)*Sqrt[Log[F]]])/(b*Sqrt[c]*n*Sqrt[Log[
F]])
```

Rule 2236

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erf[(c + d*x)*Rt[(-b)*Log[F], 2]]/(2*d*Rt[(-b)*Log[F], 2])), x] /; Fr
eeQ[{F, a, b, c, d}, x] && NegQ[b]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rubi steps

$$\begin{aligned}\int F^{-c(a+bx)^n}(a+bx)^{-1+\frac{n}{2}}\,dx &= \frac{2\mathrm{Subst}\left(\int F^{-cx^2}\,dx, x, (a+bx)^{n/2}\right)}{bn}\\ &= \frac{\sqrt{\pi}\,\mathrm{erf}\left(\sqrt{c}\,(a+bx)^{n/2}\sqrt{\log(F)}\right)}{b\sqrt{c}\,n\sqrt{\log(F)}}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 47, normalized size = 1.00

$$\frac{\sqrt{\pi}\,\mathrm{erf}\left(\sqrt{c}\,(a+bx)^{n/2}\sqrt{\log(F)}\right)}{b\sqrt{c}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^(-1 + n/2)/F^(c*(a + b*x)^n),x]
```

```
[Out] (Sqrt[Pi]*Erf[Sqrt[c]*(a + b*x)^(n/2)*Sqrt[Log[F]]])/(b*Sqrt[c]*n*Sqrt[Log[
F]])
```

Maple [A]
time = 0.08, size = 34, normalized size = 0.72

method	result	size
risch	$\frac{\sqrt{\pi}\,\mathrm{erf}\left(\sqrt{c\ln(F)}\,(bx+a)^{\frac{n}{2}}\right)}{nb\sqrt{c\ln(F)}}$	34

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^(-1+1/2*n)/(F^(c*(b*x+a)^n)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/n/b*Pi^(1/2)/(c*ln(F))^(1/2)*erf((c*ln(F))^(1/2)*(b*x+a)^(1/2*n))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^(-1+1/2*n)/(F^(c*(b*x+a)^n)),x, algorithm="maxima")
```

```
[Out] integrate((b*x + a)^(1/2*n - 1)/F^((b*x + a)^n*c), x)
```

Fricas [A]
time = 0.38, size = 47, normalized size = 1.00

$$\frac{\sqrt{\pi}\,\sqrt{c\log(F)}\,\mathrm{erf}\left((bx+a)\sqrt{c\log(F)}\,(bx+a)^{\frac{1}{2}n-1}\right)}{bcn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^(-1+1/2*n)/(F^(c*(b*x+a)^n)),x, algorithm="fricas")
```

```
[Out] sqrt(pi)*sqrt(c*log(F))*erf((b*x + a)*sqrt(c*log(F))*(b*x + a)^(1/2*n - 1))
/(b*c*n*log(F))
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{-c(a+bx)^n}(a+bx)^{\frac{n}{2}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**(-1+1/2*n)/(F**(c*(b*x+a)**n)),x)
```

```
[Out] Integral((a + b*x)**(n/2 - 1)/F**(c*(a + b*x)**n), x)
```

Giac [A]
time = 2.92, size = 35, normalized size = 0.74

$$-\frac{\sqrt{\pi}\,\operatorname{erf}\left(-\sqrt{c\log\left(F\right)}\sqrt{(bx+a)^n}\right)}{\sqrt{c\log\left(F\right)}\,bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^(-1+1/2*n)/(F^(c*(b*x+a)^n)),x, algorithm="giac")
```

```
[Out] -sqrt(pi)*erf(-sqrt(c*log(F))*sqrt((b*x + a)^n))/(sqrt(c*log(F))*b*n)
```

Mupad [B]
time = 4.04, size = 35, normalized size = 0.74

$$\frac{\sqrt{\pi}\,\operatorname{erf}\left(\sqrt{c}\,\sqrt{\ln\left(F\right)}\,{\left(a+b\,x\right)}^{n/2}\right)}{b\,\sqrt{c}\,n\,\sqrt{\ln\left(F\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*x)^(n/2 - 1)/F^(c*(a + b*x)^n),x)
```

```
[Out] (pi^(1/2)*erf(c^(1/2)*log(F)^(1/2)*(a + b*x)^(n/2)))/(b*c^(1/2)*n*log(F)^(1
/2))
```

3.382 $\int F^{a+b(c+dx)^2}(e+fx)^5\,dx$

Optimal. Leaf size=518

$$\frac{f^5F^{a+b(c+dx)^2}}{b^3d^6\log^3(F)}+\frac{15f^4(de-cf)F^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{8b^{5/2}d^6\log^{\frac{5}{2}}(F)}-\frac{5f^3(de-cf)^2F^{a+b(c+dx)^2}}{b^2d^6\log^2(F)}-\frac{15f^4(de-c}{4(}$$

```
[Out] f^5*F^(a+b*(d*x+c)^2)/b^3/d^6/ln(F)^3-5*f^3*(-c*f+d*e)^2*F^(a+b*(d*x+c)^2)/
b^2/d^6/ln(F)^2-15/4*f^4*(-c*f+d*e)*F^(a+b*(d*x+c)^2)*(d*x+c)/b^2/d^6/ln(F)
^2-f^5*F^(a+b*(d*x+c)^2)*(d*x+c)^2/b^2/d^6/ln(F)^2+5/2*f*(-c*f+d*e)^4*F^(a+
b*(d*x+c)^2)/b/d^6/ln(F)+5*f^2*(-c*f+d*e)^3*F^(a+b*(d*x+c)^2)*(d*x+c)/b/d^6
/ln(F)+5*f^3*(-c*f+d*e)^2*F^(a+b*(d*x+c)^2)*(d*x+c)^2/b/d^6/ln(F)+5/2*f^4*(
-c*f+d*e)*F^(a+b*(d*x+c)^2)*(d*x+c)^3/b/d^6/ln(F)+1/2*f^5*F^(a+b*(d*x+c)^2)
*(d*x+c)^4/b/d^6/ln(F)+15/8*f^4*(-c*f+d*e)*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(
1/2))*Pi^(1/2)/b^(5/2)/d^6/ln(F)^(5/2)-5/2*f^2*(-c*f+d*e)^3*F^a*erfi((d*x+c
)*b^(1/2)*ln(F)^(1/2))*Pi^(1/2)/b^(3/2)/d^6/ln(F)^(3/2)+1/2*(-c*f+d*e)^5*F^
a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*Pi^(1/2)/d^6/b^(1/2)/ln(F)^(1/2)
```

Rubi [A]
time = 0.63, antiderivative size = 518, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}=0.190$, Rules used = {2258, 2235, 2240, 2243}

$$\frac{15\sqrt{\pi}\,f^4F^a(de-cf)\text{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{8b^{5/2}d^6\log^{\frac{5}{2}}(F)}-\frac{5\sqrt{\pi}\,f^2F^a(de-cf)^3\text{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{2b^{3/2}d^6\log^{\frac{3}{2}}(F)}+\frac{f^5F^{a+b(c+dx)^2}}{b^3d^6\log^3(F)}-\frac{15f^4(c+dx)(de-cf)F^{a+b(c+dx)^2}}{4b^2d^6\log^2(F)}-\frac{5f^3(de-cf)^2F^{a+b(c+dx)^2}}{b^2d^6\log^2(F)}-\frac{f^5(c+dx)^2F^{a+b(c+dx)^2}}{b^2d^6\log^2(F)}+\frac{\sqrt{\pi}\,F^a(de-cf)^5\text{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{2\sqrt{b}\,d^6\sqrt{\log(F)}}+\frac{5f^4(c+dx)^3(de-cf)F^{a+b(c+dx)^2}}{2bd^6\log(F)}+\frac{5f^3(c+dx)^2(de-cf)^2F^{a+b(c+dx)^2}}{bd^6\log(F)}+\frac{5f^2(c+dx)(de-cf)^3F^{a+b(c+dx)^2}}{bd^6\log(F)}+\frac{5f(de-cf)^4F^{a+b(c+dx)^2}}{2bd^6\log(F)}+\frac{f^5(c+dx)^4F^{a+b(c+dx)^2}}{2bd^6\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(e + f*x)^5,x]
```

```
[Out] (f^5*F^(a + b*(c + d*x)^2))/(b^3*d^6*Log[F]^3) + (15*f^4*(d*e - c*f)*F^a*Sq
rt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(8*b^(5/2)*d^6*Log[F]^(5/2)) -
 (5*f^3*(d*e - c*f)^2*F^(a + b*(c + d*x)^2))/(b^2*d^6*Log[F]^2) - (15*f^4*(
d*e - c*f)*F^(a + b*(c + d*x)^2)*(c + d*x))/(4*b^2*d^6*Log[F]^2) - (f^5*F^(
a + b*(c + d*x)^2)*(c + d*x)^2)/(b^2*d^6*Log[F]^2) - (5*f^2*(d*e - c*f)^3*F
^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(2*b^(3/2)*d^6*Log[F]^(3/
2)) + (5*f*(d*e - c*f)^4*F^(a + b*(c + d*x)^2))/(2*b*d^6*Log[F]) + (5*f^2*(
d*e - c*f)^3*F^(a + b*(c + d*x)^2)*(c + d*x))/(b*d^6*Log[F]) + (5*f^3*(d*e
- c*f)^2*F^(a + b*(c + d*x)^2)*(c + d*x)^2)/(b*d^6*Log[F]) + (5*f^4*(d*e -
c*f)*F^(a + b*(c + d*x)^2)*(c + d*x)^3)/(2*b*d^6*Log[F]) + (f^5*F^(a + b*(c
 + d*x)^2)*(c + d*x)^4)/(2*b*d^6*Log[F]) + ((d*e - c*f)^5*F^a*Sqrt[Pi]*Erfi
[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(2*Sqrt[b]*d^6*Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
```

```
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\begin{aligned}
\int F^{a+b(c+dx)^2}(e+fx)^5\,dx &= \int \left(\frac{(de-cf)^5F^{a+b(c+dx)^2}}{d^5}+\frac{5f(de-cf)^4F^{a+b(c+dx)^2}(c+dx)}{d^5}+\frac{10f^2(de-cf)\cdots}{}\right.\\
&= \frac{f^5\int F^{a+b(c+dx)^2}(c+dx)^5\,dx}{d^5}+\frac{(5f^4(de-cf))\int F^{a+b(c+dx)^2}(c+dx)^4\,dx}{d^5}+\frac{(10\cdots}{}\\
&= \frac{5f(de-cf)^4F^{a+b(c+dx)^2}}{2bd^6\log(F)}+\frac{5f^2(de-cf)^3F^{a+b(c+dx)^2}(c+dx)}{bd^6\log(F)}+\frac{5f^3(de-cf)^2\cdots}{bd^6\cdots}\\
&= -\frac{5f^3(de-cf)^2F^{a+b(c+dx)^2}}{b^2d^6\log^2(F)}-\frac{15f^4(de-cf)F^{a+b(c+dx)^2}(c+dx)}{4b^2d^6\log^2(F)}-\frac{f^5F^{a+b(c+dx\cdots}}{b^2d^6\log\cdots}\\
&= \frac{f^5F^{a+b(c+dx)^2}}{b^3d^6\log^3(F)}+\frac{15f^4(de-cf)F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{8b^{5/2}d^6\log^{\frac{5}{2}}(F)}-\frac{5f^3(de-\cdots}{b^2\cdots}
\end{aligned}$$

Mathematica [A]
time = 1.36, size = 412, normalized size = 0.80

$$\frac{F^a\left(-40f^3(de-cf)^2F^{b(c+dx)^2}+\frac{15f^4(-de+cf)\left(-\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)+2\sqrt{b}\,F^{b(c+dx)^2}(c+dx)\sqrt{\log(F)}\right)}{\sqrt{b}\,\sqrt{\log(F)}}+20\sqrt{b}\,f^2(-de+cf)^3\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)\sqrt{\log(F)}+20bf(de-cf)^4F^{b(c+dx)^2}\log(F)+40bf^2(de-cf)^3F^{b(c+dx)^2}(c+dx)\log(F)+40bf^3(de-cf)^2F^{b(c+dx)^2}(c+dx)^2\log(F)+20bf^4(de-cf)F^{b(c+dx)^2}(c+dx)^3\log(F)+4bf^5F^{b(c+dx)^2}(c+dx)^4\log(F)+4b^{3/2}(de-cf)^5\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)\log^{\frac{3}{2}}(F)+\frac{8f^5F^{b(c+dx)^2}\left(1-b(c+dx)^2\log(F)\right)}{b\log(F)}\right)}{8b^2d^6\log^2(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(e + f*x)^5,x]
```

```
[Out] (F^a*(-40*f^3*(d*e - c*f)^2*F^(b*(c + d*x)^2) + (15*f^4*(-(d*e) + c*f)*(-(S
qrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]) + 2*Sqrt[b]*F^(b*(c + d*x)^2)
*(c + d*x)*Sqrt[Log[F]]))/(Sqrt[b]*Sqrt[Log[F]]) + 20*Sqrt[b]*f^2*(-(d*e) +
 c*f)^3*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]*Sqrt[Log[F]] + 20*b*f
*(d*e - c*f)^4*F^(b*(c + d*x)^2)*Log[F] + 40*b*f^2*(d*e - c*f)^3*F^(b*(c +
d*x)^2)*(c + d*x)*Log[F] + 40*b*f^3*(d*e - c*f)^2*F^(b*(c + d*x)^2)*(c + d*
x)^2*Log[F] + 20*b*f^4*(d*e - c*f)*F^(b*(c + d*x)^2)*(c + d*x)^3*Log[F] + 4
*b*f^5*F^(b*(c + d*x)^2)*(c + d*x)^4*Log[F] + 4*b^(3/2)*(d*e - c*f)^5*Sqrt[
Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]*Log[F]^(3/2) + (8*f^5*F^(b*(c + d*
x)^2)*(1 - b*(c + d*x)^2*Log[F]))/(b*Log[F])))/(8*b^2*d^6*Log[F]^2)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 1656 vs. $2(474) = 948$.
time = 0.10, size = 1657, normalized size = 3.20

method	result	size
risch	Expression too large to display	1657

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)*(f*x+e)^5,x,method=_RETURNVERBOSE)
```

```
[Out] 5/2*e^4*f*c/d^2*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c
*ln(F)/(-b*ln(F))^(1/2))-5/2*e*f^4/d^3*c/ln(F)/b*x^2*F^(b*d^2*x^2)*F^(2*b*c
*d*x)*F^(b*c^2)*F^a+5/2*e*f^4/d^4*c^2/ln(F)/b*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)
*F^(b*c^2)*F^a-5*e^2*f^3/d^3*c/ln(F)/b*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c
^2)*F^a+f^5/ln(F)^3/b^3/d^6*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-9/4*f
^5/d^6*c^2/ln(F)^2/b^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+15/8*f^5/d
^6*c/ln(F)^2/b^2*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*
c*ln(F)/(-b*ln(F))^(1/2))-f^5/ln(F)^2/b^2/d^4*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*
x)*F^(b*c^2)*F^a-15/8*e*f^4/ln(F)^2/b^2/d^5*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*e
rf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))-5*e^2*f^3/ln(F)^2/b^2/
d^4*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+5/2*e^3*f^2/ln(F)/b/d^3*Pi^(1
/2)*F^a/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/
2))+5/2*e^4*f/ln(F)/b/d^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-1/2*e^5
*Pi^(1/2)*F^a/d/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/(-b*ln
(F))^(1/2))+1/2*f^5/ln(F)/b/d^2*x^4*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F
^a+1/2*f^5/d^6*c^4/ln(F)/b*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-5/2*f^
5/d^6*c^3/ln(F)/b*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b
*c*ln(F)/(-b*ln(F))^(1/2))+1/2*f^5/d^6*c^5*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*er
f(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))+5*e^2*f^3/d^4*c^3*Pi^(1
/2)*F^a/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/
2))-5*e^3*f^2/d^3*c^2*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)
```

```
*x+b*c*ln(F)/(-b*ln(F))^(1/2))+5/2*e*f^4/ln(F)/b/d^2*x^3*F^(b*d^2*x^2)*F^(2
*b*c*d*x)*F^(b*c^2)*F^a-5/2*e*f^4/d^5*c^3/ln(F)/b*F^(b*d^2*x^2)*F^(2*b*c*d*
x)*F^(b*c^2)*F^a+15/2*e*f^4/d^5*c^2/ln(F)/b*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*e
rf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))+25/4*e*f^4/d^5*c/ln(F)
^2/b^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-15/4*e*f^4/ln(F)^2/b^2/d^4
*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+5*e^2*f^3/ln(F)/b/d^2*x^2*F^(b
*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+5*e^2*f^3/d^4*c^2/ln(F)/b*F^(b*d^2*x^
2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-15/2*e^2*f^3/d^4*c/ln(F)/b*Pi^(1/2)*F^a/(-b*
ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))+5*e^3*f^
2/ln(F)/b/d^2*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-5*e^3*f^2/d^3*c/l
n(F)/b*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-1/2*f^5/d^3*c/ln(F)/b*x^3*
F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-1/2*f^5/d^5*c^3/ln(F)/b*x*F^(b*d^
2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+7/4*f^5/d^5*c/ln(F)^2/b^2*x*F^(b*d^2*x^2
)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+1/2*f^5/d^4*c^2/ln(F)/b*x^2*F^(b*d^2*x^2)*F^(
2*b*c*d*x)*F^(b*c^2)*F^a-5/2*e*f^4/d^5*c^4*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*er
f(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 1456 vs. $2(474) = 948$.
time = 0.71, size = 1456, normalized size = 2.81

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e)^5,x, algorithm="maxima")
```

```
[Out] -5/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log
(F)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*
d))*F^a*e^4*f/(sqrt(b*log(F))*d) + 5*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(e
rf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/
2)*d^3*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^
2/(b*d^2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamm
a(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*
(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*e^3*f^2/(sqrt(b*log(F))*d
) - 5*(sqrt(pi)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*lo
g(F)/(b*d^2))) - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d)^
2*log(F)/(b*d^2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/((b
*log(F))^(7/2)*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*c*
d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2*l
og(F)/(b*d^2))^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*l
og(F)^2/((b*log(F))^(7/2)*d^3))*F^a*e^2*f^3/(sqrt(b*log(F))*d) + 5/2*(sqrt(
pi)*(b*d^2*x + b*c*d)*b^4*c^4*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2)
)) - 1)*log(F)^5/((b*log(F))^(9/2)*d^5*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*
d^2))) - 4*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^4*c^3*log(F)^4/((b*log(F))^(9/
```

```
2)*d^4) - 6*(b*d^2*x + b*c*d)^3*b^2*c^2*gamma(3/2, -(b*d^2*x + b*c*d)^2*log
(F)/(b*d^2))*log(F)^5/((b*log(F))^(9/2)*d^7*(-(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))^(3/2)) + 4*b^3*c*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F
)^3/((b*log(F))^(9/2)*d^4) - (b*d^2*x + b*c*d)^5*gamma(5/2, -(b*d^2*x + b*c
*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(9/2)*d^9*(-(b*d^2*x + b*c*d)^2*
log(F)/(b*d^2))^(5/2)))*F^a*e*f^4/(sqrt(b*log(F))*d) - 1/2*(sqrt(pi)*(b*d^2
*x + b*c*d)*b^5*c^5*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*lo
g(F)^6/((b*log(F))^(11/2)*d^6*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) -
5*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^5*c^4*log(F)^5/((b*log(F))^(11/2)*d^5)
- 10*(b*d^2*x + b*c*d)^3*b^3*c^3*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*
d^2))*log(F)^6/((b*log(F))^(11/2)*d^8*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))
^(3/2)) + 10*b^4*c^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4
/((b*log(F))^(11/2)*d^5) - b^3*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2)
)*log(F)^3/((b*log(F))^(11/2)*d^5) - 5*(b*d^2*x + b*c*d)^5*b*c*gamma(5/2, -
(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(11/2)*d^10*(-(b*d
^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)))*F^a*f^5/(sqrt(b*log(F))*d) + 1/2*sq
rt(pi)*F^(b*c^2 + a)*e^5*erf(sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt(-b*log(F
)))/(sqrt(-b*log(F))*F^(b*c^2)*d)
```

Fricas [A]
time = 0.39, size = 525, normalized size = 1.01

$$\frac{\sqrt{\pi}\left(15\,cf^5-15\,df^4e+4\left(b^2c^5f^5-5\,b^2c^4df^4e+10\,b^2c^3d^2f^3e^2-10\,b^2c^2d^3f^2e^3+5\,b^2cd^4fe^4-b^2d^5e^5\right)\log\left(F\right)^2-20\left(bc^3f^5-3\,bc^2df^4e+3\,bcd^2f^3e^2-bd^3f^2e^3\right)\log\left(F\right)\right)\sqrt{-bd^2\log\left(F\right)}\,F^a\operatorname{erf}\left(\frac{\sqrt{-bd^2\log\left(F\right)}\,(dx+c)}{d}\right)+2\left(4\,df^5+2\left(b^2d^5f^5x^4-b^2cd^4f^5x^3+b^2c^2d^3f^5x^2-b^2c^3d^2f^5x+b^2c^4df^5+5\,b^2d^5fe^4+10\left(b^2d^5f^2x-b^2cd^4f^2\right)e^3+10\left(b^2d^5f^3x^2-b^2cd^4f^3x+b^2c^2d^3f^3\right)e^2+5\left(b^2d^5f^4x^3-b^2cd^4f^4x^2+b^2c^2d^3f^4x-b^2c^3d^2f^4\right)e\right)\log\left(F\right)^2-\left(4\,bd^3f^5x^2-7\,bcd^2f^5x+9\,bc^2df^5+20\,bd^3f^3e^2+5\left(3\,bd^3f^4x-5\,bcd^2f^4\right)e\right)\log\left(F\right)\right)F^{bd^2x^2+2\,bcdx+bc^2+a}}{8\,b^3d^7\log\left(F\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e)^5,x, algorithm="fricas")
```

```
[Out] 1/8*(sqrt(pi)*(15*c*f^5 - 15*d*f^4*e + 4*(b^2*c^5*f^5 - 5*b^2*c^4*d*f^4*e +
 10*b^2*c^3*d^2*f^3*e^2 - 10*b^2*c^2*d^3*f^2*e^3 + 5*b^2*c*d^4*f*e^4 - b^2*
d^5*e^5)*log(F)^2 - 20*(b*c^3*f^5 - 3*b*c^2*d*f^4*e + 3*b*c*d^2*f^3*e^2 - b
*d^3*f^2*e^3)*log(F))*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^2*log(F))*(d*x
+ c)/d) + 2*(4*d*f^5 + 2*(b^2*d^5*f^5*x^4 - b^2*c*d^4*f^5*x^3 + b^2*c^2*d^3
*f^5*x^2 - b^2*c^3*d^2*f^5*x + b^2*c^4*d*f^5 + 5*b^2*d^5*f*e^4 + 10*(b^2*d^
5*f^2*x - b^2*c*d^4*f^2)*e^3 + 10*(b^2*d^5*f^3*x^2 - b^2*c*d^4*f^3*x + b^2*
c^2*d^3*f^3)*e^2 + 5*(b^2*d^5*f^4*x^3 - b^2*c*d^4*f^4*x^2 + b^2*c^2*d^3*f^4
*x - b^2*c^3*d^2*f^4)*e)*log(F)^2 - (4*b*d^3*f^5*x^2 - 7*b*c*d^2*f^5*x + 9*
b*c^2*d*f^5 + 20*b*d^3*f^3*e^2 + 5*(3*b*d^3*f^4*x - 5*b*c*d^2*f^4)*e)*log(F
))*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a))/(b^3*d^7*log(F)^3)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^2}(e+fx)^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(f*x+e)**5,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)*(e + f*x)**5, x)
```

Giac [A]
time = 3.45, size = 942, normalized size = 1.82

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e)^5,x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F) + 5)/(sqrt(-b*l
og(F))*d) + 5/2*(sqrt(pi)*c*f*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F)
 + 4)/(sqrt(-b*log(F))*d) + f*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^
2*log(F) + a*log(F) + 4)/(b*d*log(F)))/d - 5/2*(sqrt(pi)*(2*b*c^2*f^2*log(F
) - f^2)*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F) + 3)/(sqrt(-b*log(F)
)*b*d*log(F)) - 2*(d*f^2*(x + c/d) - 2*c*f^2)*e^(b*d^2*x^2*log(F) + 2*b*c*d
*x*log(F) + b*c^2*log(F) + a*log(F) + 3)/(b*d*log(F)))/d^2 + 5/2*(sqrt(pi)*
(2*b*c^3*f^3*log(F) - 3*c*f^3)*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F
) + 2)/(sqrt(-b*log(F))*b*d*log(F)) + 2*(b*d^2*f^3*(x + c/d)^2*log(F) - 3*b
*c*d*f^3*(x + c/d)*log(F) + 3*b*c^2*f^3*log(F) - f^3)*e^(b*d^2*x^2*log(F) +
 2*b*c*d*x*log(F) + b*c^2*log(F) + a*log(F) + 2)/(b^2*d*log(F)^2))/d^3 - 5/
8*(sqrt(pi)*(4*b^2*c^4*f^4*log(F)^2 - 12*b*c^2*f^4*log(F) + 3*f^4)*erf(-sqr
t(-b*log(F))*d*(x + c/d))*e^(a*log(F) + 1)/(sqrt(-b*log(F))*b^2*d*log(F)^2)
 - 2*(2*b*d^3*f^4*(x + c/d)^3*log(F) - 8*b*c*d^2*f^4*(x + c/d)^2*log(F) + 1
2*b*c^2*d*f^4*(x + c/d)*log(F) - 8*b*c^3*f^4*log(F) - 3*d*f^4*(x + c/d) + 8
*c*f^4)*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^2*log(F) + a*log(F) +
1)/(b^2*d*log(F)^2))/d^4 + 1/8*(sqrt(pi)*(4*b^2*c^5*f^5*log(F)^2 - 20*b*c^3
*f^5*log(F) + 15*c*f^5)*F^a*erf(-sqrt(-b*log(F))*d*(x + c/d))/(sqrt(-b*log(
F))*b^2*d*log(F)^2) + 2*(2*b^2*d^4*f^5*(x + c/d)^4*log(F)^2 - 10*b^2*c*d^3*
f^5*(x + c/d)^3*log(F)^2 + 20*b^2*c^2*d^2*f^5*(x + c/d)^2*log(F)^2 - 20*b^2
*c^3*d*f^5*(x + c/d)*log(F)^2 + 10*b^2*c^4*f^5*log(F)^2 - 4*b*d^2*f^5*(x +
c/d)^2*log(F) + 15*b*c*d*f^5*(x + c/d)*log(F) - 20*b*c^2*f^5*log(F) + 4*f^5
)*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^2*log(F) + a*log(F))/(b^3*d*
log(F)^3))/d^5
```

Mupad [B]
time = 4.11, size = 716, normalized size = 1.38

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(e + f*x)^5,x)
```

```
[Out] (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*(f^5 + (log(F)^2*(2*F^a*b^2*c^4*
f^5 + 10*F^a*b^2*d^4*e^4*f + 20*F^a*b^2*c^2*d^2*e^2*f^3 - 10*F^a*b^2*c^3*d*
```

```
e*f^4 - 20*F^a*b^2*c*d^3*e^3*f^2))/(4*F^a) - (log(F)*(9*F^a*b*c^2*f^5 + 20*
F^a*b*d^2*e^2*f^3 - 25*F^a*b*c*d*e*f^4))/(4*F^a)))/(b^3*d^6*log(F)^3) - erf
i((b*c*d*log(F) + b*d^2*x*log(F))/(b*d^2*log(F))^(1/2))*(((F^a*pi^(1/2)*(15
*c*f^5 - 15*d*e*f^4))/(8*(b*d^2*log(F))^(1/2)) - (F^a*pi^(1/2)*log(F)*(20*b
*c^3*f^5 - 20*b*d^3*e^3*f^2 - 60*b*c^2*d*e*f^4 + 60*b*c*d^2*e^2*f^3))/(8*(b
*d^2*log(F))^(1/2)))/(b^2*d^5*log(F)^2) + (F^a*pi^(1/2)*(4*b^2*c^5*f^5 - 4*
b^2*d^5*e^5 - 40*b^2*c^2*d^3*e^3*f^2 + 40*b^2*c^3*d^2*e^2*f^3 + 20*b^2*c*d^
4*e^4*f - 20*b^2*c^4*d*e*f^4))/(8*b^2*d^5*(b*d^2*log(F))^(1/2))) - (F^(b*d^
2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*x*(log(F)*((b*c^3*f^5)/2 - 5*b*d^3*e^3*f
^2 - (5*b*c^2*d*e*f^4)/2 + 5*b*c*d^2*e^2*f^3) - (7*c*f^5)/4 + (15*d*e*f^4)/
4))/(b^2*d^5*log(F)^2) + (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*f^5*x^4
)/(2*b*d^2*log(F)) - (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*x^2*(f^5 -
(b*f^3*(c^2*f^2*log(F) + 10*d^2*e^2*log(F) - 5*c*d*e*f*log(F)))/2))/(b^2*d^
4*log(F)^2) - (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*f^4*x^3*(c*f - 5*d
*e))/(2*b*d^3*log(F))
```

3.383 $\int F^{a+b(c+dx)^2}(e+fx)^4\,dx$

Optimal. Leaf size=389

$$\frac{3f^4F^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{8b^{5/2}d^5\log^{\frac{5}{2}}(F)}-\frac{2f^3(de-cf)F^{a+b(c+dx)^2}}{b^2d^5\log^2(F)}-\frac{3f^4F^{a+b(c+dx)^2}(c+dx)}{4b^2d^5\log^2(F)}-3f^2(de-cf)^2F$$

```
[Out] -2*f^3*(-c*f+d*e)*F^(a+b*(d*x+c)^2)/b^2/d^5/ln(F)^2-3/4*f^4*F^(a+b*(d*x+c)^
2)*(d*x+c)/b^2/d^5/ln(F)^2+2*f*(-c*f+d*e)^3*F^(a+b*(d*x+c)^2)/b/d^5/ln(F)+3
*f^2*(-c*f+d*e)^2*F^(a+b*(d*x+c)^2)*(d*x+c)/b/d^5/ln(F)+2*f^3*(-c*f+d*e)*F^
(a+b*(d*x+c)^2)*(d*x+c)^2/b/d^5/ln(F)+1/2*f^4*F^(a+b*(d*x+c)^2)*(d*x+c)^3/b
/d^5/ln(F)+3/8*f^4*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*Pi^(1/2)/b^(5/2)/d
^5/ln(F)^(5/2)-3/2*f^2*(-c*f+d*e)^2*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*P
i^(1/2)/b^(3/2)/d^5/ln(F)^(3/2)+1/2*(-c*f+d*e)^4*F^a*erfi((d*x+c)*b^(1/2)*l
n(F)^(1/2))*Pi^(1/2)/d^5/b^(1/2)/ln(F)^(1/2)
```

Rubi [A]

time = 0.45, antiderivative size = 389, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2258, 2235, 2240, 2243}

$$-\frac{3\sqrt{\pi}\,f^2F^a(de-cf)^2\text{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{2b^{3/2}d^5\log^{\frac{3}{2}}(F)}+\frac{3\sqrt{\pi}\,f^4F^a\text{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{8b^{5/2}d^5\log^{\frac{5}{2}}(F)}-\frac{2f^3(de-cf)F^{a+b(c+dx)^2}}{b^2d^5\log^2(F)}-\frac{3f^4(c+dx)F^{a+b(c+dx)^2}}{4b^2d^5\log^2(F)}+\frac{\sqrt{\pi}\,F^a(de-cf)^4\text{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{2\sqrt{b}\,d^5\sqrt{\log(F)}}+\frac{2f^3(c+dx)^2(de-cf)F^{a+b(c+dx)^2}}{bd^5\log(F)}+\frac{3f^2(c+dx)(de-cf)^2F^{a+b(c+dx)^2}}{bd^5\log(F)}+\frac{2f(de-cf)^3F^{a+b(c+dx)^2}}{bd^5\log(F)}+\frac{f^4(c+dx)^3F^{a+b(c+dx)^2}}{2bd^5\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(e + f*x)^4,x]
```

```
[Out] (3*f^4*F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(8*b^(5/2)*d^5*Lo
g[F]^(5/2)) - (2*f^3*(d*e - c*f)*F^(a + b*(c + d*x)^2))/(b^2*d^5*Log[F]^2)
- (3*f^4*F^(a + b*(c + d*x)^2)*(c + d*x))/(4*b^2*d^5*Log[F]^2) - (3*f^2*(d*
e - c*f)^2*F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(2*b^(3/2)*d^
5*Log[F]^(3/2)) + (2*f*(d*e - c*f)^3*F^(a + b*(c + d*x)^2))/(b*d^5*Log[F])
+ (3*f^2*(d*e - c*f)^2*F^(a + b*(c + d*x)^2)*(c + d*x))/(b*d^5*Log[F]) + (2
*f^3*(d*e - c*f)*F^(a + b*(c + d*x)^2)*(c + d*x)^2)/(b*d^5*Log[F]) + (f^4*F
^(a + b*(c + d*x)^2)*(c + d*x)^3)/(2*b*d^5*Log[F]) + ((d*e - c*f)^4*F^a*Sqr
t[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(2*Sqrt[b]*d^5*Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
```

```
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(e+fx)^4\,dx = \int \left(\frac{(de-cf)^4F^{a+b(c+dx)^2}}{d^4} + \frac{4f(de-cf)^3F^{a+b(c+dx)^2}(c+dx)}{d^4} + \frac{6f^2(de-cf\cdots}{\cdots}\right.$$

$$= \frac{f^4\int F^{a+b(c+dx)^2}(c+dx)^4\,dx}{d^4} + \frac{(4f^3(de-cf))\int F^{a+b(c+dx)^2}(c+dx)^3\,dx}{d^4} + \frac{(6\cdots}{\cdots}$$

$$= \frac{2f(de-cf)^3F^{a+b(c+dx)^2}}{bd^5\log(F)} + \frac{3f^2(de-cf)^2F^{a+b(c+dx)^2}(c+dx)}{bd^5\log(F)} + \frac{2f^3(de-cf)\cdots}{bd\cdots}$$

$$= -\frac{2f^3(de-cf)F^{a+b(c+dx)^2}}{b^2d^5\log^2(F)} - \frac{3f^4F^{a+b(c+dx)^2}(c+dx)}{4b^2d^5\log^2(F)} - \frac{3f^2(de-cf)^2F^a\sqrt{\pi}\,\mathrm{e}\cdots}{2b^{3/2}\cdots}$$

$$= \frac{3f^4F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{8b^{5/2}d^5\log^{\frac{5}{2}}(F)} - \frac{2f^3(de-cf)F^{a+b(c+dx)^2}}{b^2d^5\log^2(F)} - \frac{3f^4F^{a+\cdots}}{4b^{\cdots}}$$

Mathematica [A]
time = 1.22, size = 220, normalized size = 0.57

$$\frac{F^a\left(2\sqrt{b}\,fF^{b(c+dx)^2}\sqrt{\log(F)}\,(f^2(-8de+5cf-3dfx)+2b(-c^3f^3+c^2df^2(4e+fx)-cd^2f(6e^2+4efx+f^2x^2)+d^3(4e^3+6e^2fx+4ef^2x^2+f^3x^3))\log(F))+\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)(3f^4-12bf^2(de-cf)^2\log(F)+4b^2(de-cf)^4\log^2(F))\right)}{8b^{5/2}d^5\log^{\frac{5}{2}}(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(e + f*x)^4,x]
```

[Out] (F^a*(2*Sqrt[b]*f*F^(b*(c + d*x)^2)*Sqrt[Log[F]]*(f^2*(-8*d*e + 5*c*f - 3*d*f*x) + 2*b*(-(c^3*f^3) + c^2*d*f^2*(4*e + f*x) - c*d^2*f*(6*e^2 + 4*e*f*x + f^2*x^2) + d^3*(4*e^3 + 6*e^2*f*x + 4*e*f^2*x^2 + f^3*x^3))*Log[F]) + Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]*(3*f^4 - 12*b*f^2*(d*e - c*f)^2*Log[F] + 4*b^2*(d*e - c*f)^4*Log[F]^2)))/(8*b^(5/2)*d^5*Log[F]^(5/2))

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 1062 vs. $2(349) = 698$.
time = 0.09, size = 1063, normalized size = 2.73

method	result
risch	$-\frac{e^4\sqrt{\pi}\,F^a \operatorname{erf}\left(-d\sqrt{-b\ln(F)}\,x+\frac{bc\ln(F)}{\sqrt{-b\ln(F)}}\right)}{2d\sqrt{-b\ln(F)}}+\frac{f^4x^3F^{b\,d^2x^2}F^{2bcdx}F^{b\,c^2}F^a}{2\ln(F)b\,d^2}-\frac{f^4cx^2F^{b\,d^2x^2}F^{2bcdx}F^{b\,c^2}F^a}{2d^3\ln(F)b}+$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a+b*(d*x+c)^2)*(f*x+e)^4,x,method=_RETURNVERBOSE)

[Out] -1/2*e^4*Pi^(1/2)*F^a/d/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))+1/2*f^4/ln(F)/b/d^2*x^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-1/2*f^4/d^3*c/ln(F)/b*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+1/2*f^4/d^4*c^2/ln(F)/b*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-1/2*f^4/d^5*c^3/ln(F)/b*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-1/2*f^4/d^5*c^4*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))+3/2*f^4/d^5*c^2/ln(F)/b*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))+5/4*f^4/d^5*c/ln(F)^2/b^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-3/4*f^4/ln(F)^2/b^2/d^4*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-3/8*f^4/ln(F)^2/b^2/d^5*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))+2*e*f^3/ln(F)/b/d^2*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-2*e*f^3/d^3*c/ln(F)/b*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+2*e*f^3/d^4*c^2/ln(F)/b*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+2*e*f^3/d^4*c^3*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))-3*e*f^3/d^4*c/ln(F)/b*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))-2*e*f^3/ln(F)^2/b^2/d^4*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+3*e^2*f^2/ln(F)/b/d^2*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-3*e^2*f^2/d^3*c/ln(F)/b*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-3*e^2*f^2/d^3*c^2*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))+3/2*e^2*f^2/ln(F)/b/d^3*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))+2*e^3*f/ln(F)/b/d^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+2*e^3*f*c/d^2*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 1052 vs. $2(349) = 698$.

time = 0.60, size = 1052, normalized size = 2.70

$$-\frac{2\left(\frac{\sqrt{\pi}\,(bd^2x+bcd)bc\left(\operatorname{erf}\left(\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}\right)-1\right)\log(F)^2}{(b\log(F))^{\frac{3}{2}}d^2\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}}-\frac{F^{\frac{(bd^2x+bcd)^2}{bd^2}}b\log(F)}{(b\log(F))^{\frac{3}{2}}d}\right)F^ae^3f}{\sqrt{b\log(F)}\,d}+\frac{3\left(\frac{\sqrt{\pi}\,(bd^2x+bcd)b^2c^2\left(\operatorname{erf}\left(\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}\right)-1\right)\log(F)^3}{(b\log(F))^{\frac{5}{2}}d^3\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}}-\frac{2F^{\frac{(bd^2x+bcd)^2}{bd^2}}b^2c\log(F)^2}{(b\log(F))^{\frac{5}{2}}d^2}-\frac{(bd^2x+bcd)^3\Gamma\left(\frac{3}{2},-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)\log(F)^3}{(b\log(F))^{\frac{5}{2}}d^5\left(-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)^{\frac{3}{2}}}\right)F^ae^2f^2}{\sqrt{b\log(F)}\,d}-\frac{2\left(\frac{\sqrt{\pi}\,(bd^2x+bcd)b^3c^3\left(\operatorname{erf}\left(\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}\right)-1\right)\log(F)^4}{(b\log(F))^{\frac{7}{2}}d^4\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}}-\frac{3F^{\frac{(bd^2x+bcd)^2}{bd^2}}b^3c^2\log(F)^3}{(b\log(F))^{\frac{7}{2}}d^3}-\frac{3(bd^2x+bcd)^3bc\,\Gamma\left(\frac{3}{2},-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)\log(F)^4}{(b\log(F))^{\frac{7}{2}}d^6\left(-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)^{\frac{3}{2}}}+\frac{b^2\Gamma\left(2,-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)\log(F)^2}{(b\log(F))^{\frac{7}{2}}d^3}\right)F^aef^3}{\sqrt{b\log(F)}\,d}+\frac{\left(\frac{\sqrt{\pi}\,(bd^2x+bcd)b^4c^4\left(\operatorname{erf}\left(\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}\right)-1\right)\log(F)^5}{(b\log(F))^{\frac{9}{2}}d^5\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}}-\frac{8F^{\frac{(bd^2x+bcd)^2}{bd^2}}b^4c^3\log(F)^4}{(b\log(F))^{\frac{9}{2}}d^4}-\frac{12(bd^2x+bcd)^3b^2c^2\Gamma\left(\frac{3}{2},-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)\log(F)^5}{(b\log(F))^{\frac{9}{2}}d^7\left(-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)^{\frac{3}{2}}}+\frac{8b^3c\,\Gamma\left(2,-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)\log(F)^3}{(b\log(F))^{\frac{9}{2}}d^4}-\frac{2(bd^2x+bcd)^5\Gamma\left(\frac{5}{2},-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)\log(F)^5}{(b\log(F))^{\frac{9}{2}}d^9\left(-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)^{\frac{5}{2}}}\right)F^af^4}{2\sqrt{b\log(F)}\,d}+\frac{\sqrt{\pi}\,F^ae^4\operatorname{erf}\left(\sqrt{-b\log(F)}\,dx-\frac{bc\log(F)}{\sqrt{-b\log(F)}}\right)}{2\sqrt{-b\log(F)}\,F^{bc^2}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e)^4,x, algorithm="maxima")
```

```
[Out] -2*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*d)
)*F^a*e^3*f/(sqrt(b*log(F))*d) + 3*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(erf
(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2)
*d^3*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2/
(b*d^2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma(
3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(-
(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*e^2*f^2/(sqrt(b*log(F))*d)
- 2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(
F)/(b*d^2))) - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d)^2*
log(F)/(b*d^2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/((b*l
og(F))^(7/2)*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*c*d)
^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2*log
(F)/(b*d^2))^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log
(F)^2/((b*log(F))^(7/2)*d^3))*F^a*e*f^3/(sqrt(b*log(F))*d) + 1/2*(sqrt(pi)*
(b*d^2*x + b*c*d)*b^4*c^4*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) -
 1)*log(F)^5/((b*log(F))^(9/2)*d^5*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2)
)) - 4*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^4*c^3*log(F)^4/((b*log(F))^(9/2)*d
^4) - 6*(b*d^2*x + b*c*d)^3*b^2*c^2*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))*log(F)^5/((b*log(F))^(9/2)*d^7*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2
))^(3/2)) + 4*b^3*c*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/
((b*log(F))^(9/2)*d^4) - (b*d^2*x + b*c*d)^5*gamma(5/2, -(b*d^2*x + b*c*d)^
2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(9/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(
F)/(b*d^2))^(5/2)))*F^a*f^4/(sqrt(b*log(F))*d) + 1/2*sqrt(pi)*F^(b*c^2 + a)
*e^4*erf(sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt(-b*log(F)))/(sqrt(-b*log(F))
*F^(b*c^2)*d)
```

Fricas [A]
time = 0.41, size = 361, normalized size = 0.93

$$-\frac{\sqrt{\pi}\left(3f^4+4\left(b^2c^4f^4-4b^2c^3df^3e+6b^2c^2d^2f^2e^2-4b^2cd^3fe^3+b^2d^4e^4\right)\log(F)^2-12\left(bc^2f^4-2bcdf^3e+bd^2f^2e^2\right)\log(F)\right)\sqrt{-bd^2\log(F)}\,F^a\operatorname{erf}\left(\frac{\sqrt{-bd^2\log(F)}\,(dx+c)}{d}\right)-2\left(2\left(b^2d^4f^4x^3-b^2cd^3f^4x^2+b^2c^2d^2f^4x-b^2c^3df^4+4b^2d^4fe^3+6\left(b^2d^4f^2x-b^2cd^3f^2\right)e^2+4\left(b^2d^4f^3x^2-b^2cd^3f^3x+b^2c^2d^2f^3\right)e\right)\log(F)^2-\left(3bd^2f^4x-5bcdf^4+8bd^2f^3e\right)\log(F)\right)F^{bd^2x^2+2bcdx+bc^2+a}}{8b^3d^6\log(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e)^4,x, algorithm="fricas")
```

```
[Out] -1/8*(sqrt(pi)*(3*f^4 + 4*(b^2*c^4*f^4 - 4*b^2*c^3*d*f^3*e + 6*b^2*c^2*d^2*
f^2*e^2 - 4*b^2*c*d^3*f*e^3 + b^2*d^4*e^4)*log(F)^2 - 12*(b*c^2*f^4 - 2*b*c
```

```
*d*f^3*e + b*d^2*f^2*e^2)*log(F))*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^2*l
og(F))*(d*x + c)/d) - 2*(2*(b^2*d^4*f^4*x^3 - b^2*c*d^3*f^4*x^2 + b^2*c^2*d
^2*f^4*x - b^2*c^3*d*f^4 + 4*b^2*d^4*f*e^3 + 6*(b^2*d^4*f^2*x - b^2*c*d^3*f
^2)*e^2 + 4*(b^2*d^4*f^3*x^2 - b^2*c*d^3*f^3*x + b^2*c^2*d^2*f^3)*e)*log(F)
^2 - (3*b*d^2*f^4*x - 5*b*c*d*f^4 + 8*b*d^2*f^3*e)*log(F))*F^(b*d^2*x^2 + 2
*b*c*d*x + b*c^2 + a))/(b^3*d^6*log(F)^3)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^2}(e+fx)^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(f*x+e)**4,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)*(e + f*x)**4, x)
```

Giac [A]
time = 2.75, size = 644, normalized size = 1.66

$$-\frac{\sqrt{\pi}\,\operatorname{erf}\left(-\sqrt{-b\log(F)}\,d\left(x+\frac{c}{d}\right)\right)e^{(a\log(F)+4)}}{2\sqrt{-b\log(F)}\,d}+\frac{2\left(\frac{\sqrt{\pi}\,cf\operatorname{erf}\left(-\sqrt{-b\log(F)}\,d\left(x+\frac{c}{d}\right)\right)e^{(a\log(F)+3)}}{\sqrt{-b\log(F)}\,d}+\frac{fe^{\left(bd^2x^2\log(F)+2bcdx\log(F)+bc^2\log(F)+a\log(F)+3\right)}}{bd\log(F)}\right)}{d}-\frac{3\left(\frac{\sqrt{\pi}\left(2bc^2f^2\log(F)-f^2\right)\operatorname{erf}\left(-\sqrt{-b\log(F)}\,d\left(x+\frac{c}{d}\right)\right)e^{(a\log(F)+2)}}{\sqrt{-b\log(F)}\,bd\log(F)}-\frac{2\left(df^2\left(x+\frac{c}{d}\right)-2cf^2\right)e^{\left(bd^2x^2\log(F)+2bcdx\log(F)+bc^2\log(F)+a\log(F)+2\right)}}{bd\log(F)}\right)}{2d^2}+\frac{\frac{\sqrt{\pi}\left(2bc^3f^3\log(F)-3cf^3\right)\operatorname{erf}\left(-\sqrt{-b\log(F)}\,d\left(x+\frac{c}{d}\right)\right)e^{(a\log(F)+1)}}{\sqrt{-b\log(F)}\,bd\log(F)}+\frac{2\left(bd^2f^3\left(x+\frac{c}{d}\right)^2\log(F)-3bcdf^3\left(x+\frac{c}{d}\right)\log(F)+3bc^2f^3\log(F)-f^3\right)e^{\left(bd^2x^2\log(F)+2bcdx\log(F)+bc^2\log(F)+a\log(F)+1\right)}}{b^2d\log(F)^2}}{d^3}-\frac{\frac{\sqrt{\pi}\left(4b^2c^4f^4\log(F)^2-12bc^2f^4\log(F)+3f^4\right)F^a\operatorname{erf}\left(-\sqrt{-b\log(F)}\,d\left(x+\frac{c}{d}\right)\right)}{\sqrt{-b\log(F)}\,b^2d\log(F)^2}-\frac{2\left(2bd^3f^4\left(x+\frac{c}{d}\right)^3\log(F)-8bcd^2f^4\left(x+\frac{c}{d}\right)^2\log(F)+12bc^2df^4\left(x+\frac{c}{d}\right)\log(F)-8bc^3f^4\log(F)-3df^4\left(x+\frac{c}{d}\right)+8cf^4\right)e^{\left(bd^2x^2\log(F)+2bcdx\log(F)+bc^2\log(F)+a\log(F)\right)}}{b^2d\log(F)^2}}{8d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e)^4,x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F) + 4)/(sqrt(-b*l
og(F))*d) + 2*(sqrt(pi)*c*f*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F) +
 3)/(sqrt(-b*log(F))*d) + f*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^2*
log(F) + a*log(F) + 3)/(b*d*log(F)))/d - 3/2*(sqrt(pi)*(2*b*c^2*f^2*log(F)
- f^2)*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F) + 2)/(sqrt(-b*log(F))*
b*d*log(F)) - 2*(d*f^2*(x + c/d) - 2*c*f^2)*e^(b*d^2*x^2*log(F) + 2*b*c*d*x
*log(F) + b*c^2*log(F) + a*log(F) + 2)/(b*d*log(F)))/d^2 + (sqrt(pi)*(2*b*c
^3*f^3*log(F) - 3*c*f^3)*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F) + 1)
/(sqrt(-b*log(F))*b*d*log(F)) + 2*(b*d^2*f^3*(x + c/d)^2*log(F) - 3*b*c*d*f
^3*(x + c/d)*log(F) + 3*b*c^2*f^3*log(F) - f^3)*e^(b*d^2*x^2*log(F) + 2*b*c
*d*x*log(F) + b*c^2*log(F) + a*log(F) + 1)/(b^2*d*log(F)^2))/d^3 - 1/8*(sqr
t(pi)*(4*b^2*c^4*f^4*log(F)^2 - 12*b*c^2*f^4*log(F) + 3*f^4)*F^a*erf(-sqrt(
-b*log(F))*d*(x + c/d))/(sqrt(-b*log(F))*b^2*d*log(F)^2) - 2*(2*b*d^3*f^4*(
x + c/d)^3*log(F) - 8*b*c*d^2*f^4*(x + c/d)^2*log(F) + 12*b*c^2*d*f^4*(x +
c/d)*log(F) - 8*b*c^3*f^4*log(F) - 3*d*f^4*(x + c/d) + 8*c*f^4)*e^(b*d^2*x^
2*log(F) + 2*b*c*d*x*log(F) + b*c^2*log(F) + a*log(F))/(b^2*d*log(F)^2))/d^
4
```

Mupad [B]
time = 3.68, size = 517, normalized size = 1.33

$$\operatorname{erfi}\left(\frac{b\,x\,\ln(F)\,d^2+b\,c\,\ln(F)\,d}{\sqrt{b\,d^2\,\ln(F)}}\right)\left(\frac{\frac{3\,F^a\,f^4\,\sqrt{\pi}}{8\,\sqrt{b\,d^2\,\ln(F)}}-\frac{F^a\,\sqrt{\pi}\,\ln(F)\,(12\,b\,c^2\,f^4-24\,b\,c\,d\,e\,f^3+12\,b\,d^2\,e^2\,f^2)}{8\,\sqrt{b\,d^2\,\ln(F)}}}{b^2\,d^4\,\ln(F)^2}+\frac{F^a\,\sqrt{\pi}\,(4\,b^2\,c^4\,f^4-16\,b^2\,c^3\,d\,e\,f^3+24\,b^2\,c^2\,d^2\,e^2\,f^2-16\,b^2\,c\,d^3\,e^3\,f+4\,b^2\,d^4\,e^4)}{8\,b^2\,d^4\,\sqrt{b\,d^2\,\ln(F)}}\right)+\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\left(\frac{5\,F^a\,c\,f^4-8\,F^a\,d\,e\,f^3}{4\,F^a}-\frac{b\,(2\,F^a\,c^3\,f^4\,\ln(F)-8\,F^a\,d^3\,e^3\,f\,\ln(F)-8\,F^a\,c^2\,d\,e\,f^3\,\ln(F)+12\,F^a\,c\,d^2\,e^2\,f^2\,\ln(F))}{4\,F^a}\right)}{b^2\,d^5\,\ln(F)^2}+\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,f^4\,x^3}{2\,b\,d^2\,\ln(F)}+\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,x\left(b\left(\frac{\ln(F)\,c^2\,f^4}{2}-2\,\ln(F)\,c\,d\,e\,f^3+3\,\ln(F)\,d^2\,e^2\,f^2\right)-\frac{3\,f^4}{4}\right)}{b^2\,d^4\,\ln(F)^2}-\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,f^3\,x^2\,(c\,f-4\,d\,e)}{2\,b\,d^3\,\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(e + f*x)^4,x)
```

```
[Out] erfi((b*c*d*log(F) + b*d^2*x*log(F))/(b*d^2*log(F))^(1/2))*(((3*F^a*f^4*pi^
(1/2))/(8*(b*d^2*log(F))^(1/2)) - (F^a*pi^(1/2)*log(F)*(12*b*c^2*f^4 + 12*b
*d^2*e^2*f^2 - 24*b*c*d*e*f^3))/(8*(b*d^2*log(F))^(1/2)))/(b^2*d^4*log(F)^2
) + (F^a*pi^(1/2)*(4*b^2*c^4*f^4 + 4*b^2*d^4*e^4 + 24*b^2*c^2*d^2*e^2*f^2 -
 16*b^2*c*d^3*e^3*f - 16*b^2*c^3*d*e*f^3))/(8*b^2*d^4*(b*d^2*log(F))^(1/2))
) + (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*((5*F^a*c*f^4 - 8*F^a*d*e*f^
3)/(4*F^a) - (b*(2*F^a*c^3*f^4*log(F) - 8*F^a*d^3*e^3*f*log(F) - 8*F^a*c^2*
d*e*f^3*log(F) + 12*F^a*c*d^2*e^2*f^2*log(F)))/(4*F^a)))/(b^2*d^5*log(F)^2)
 + (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*f^4*x^3)/(2*b*d^2*log(F)) + (
F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*x*(b*((c^2*f^4*log(F))/2 + 3*d^2*
e^2*f^2*log(F) - 2*c*d*e*f^3*log(F)) - (3*f^4)/4))/(b^2*d^4*log(F)^2) - (F^
(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*f^3*x^2*(c*f - 4*d*e))/(2*b*d^3*log
(F))
```

3.384 $\int F^{a+b(c+dx)^2}(e+fx)^3\,dx$

Optimal. Leaf size=258

$$-\frac{f^3F^{a+b(c+dx)^2}}{2b^2d^4\log^2(F)}-\frac{3f^2(de-cf)F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{4b^{3/2}d^4\log^{\frac{3}{2}}(F)}+\frac{3f(de-cf)^2F^{a+b(c+dx)^2}}{2bd^4\log(F)}+\frac{3f^2(de-cf)}{2bd}$$

```
[Out] -1/2*f^3*F^(a+b*(d*x+c)^2)/b^2/d^4/ln(F)^2+3/2*f*(-c*f+d*e)^2*F^(a+b*(d*x+c
)^2)/b/d^4/ln(F)+3/2*f^2*(-c*f+d*e)*F^(a+b*(d*x+c)^2)*(d*x+c)/b/d^4/ln(F)+1
/2*f^3*F^(a+b*(d*x+c)^2)*(d*x+c)^2/b/d^4/ln(F)-3/4*f^2*(-c*f+d*e)*F^a*erfi(
(d*x+c)*b^(1/2)*ln(F)^(1/2))*Pi^(1/2)/b^(3/2)/d^4/ln(F)^(3/2)+1/2*(-c*f+d*e
)^3*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*Pi^(1/2)/d^4/b^(1/2)/ln(F)^(1/2)
```

Rubi [A]
time = 0.30, antiderivative size = 258, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.190$, Rules used = {2258, 2235, 2240, 2243}

$$-\frac{3\sqrt{\pi}\,f^2F^a(de-cf)\mathrm{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{4b^{3/2}d^4\log^{\frac{3}{2}}(F)}-\frac{f^3F^{a+b(c+dx)^2}}{2b^2d^4\log^2(F)}+\frac{\sqrt{\pi}\,F^a(de-cf)^3\mathrm{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{2\sqrt{b}\,d^4\sqrt{\log(F)}}+\frac{3f^2(c+dx)(de-cf)F^{a+b(c+dx)^2}}{2bd^4\log(F)}+\frac{3f(de-cf)^2F^{a+b(c+dx)^2}}{2bd^4\log(F)}+\frac{f^3(c+dx)^2F^{a+b(c+dx)^2}}{2bd^4\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(e + f*x)^3,x]
```

```
[Out] -1/2*(f^3*F^(a + b*(c + d*x)^2))/(b^2*d^4*Log[F]^2) - (3*f^2*(d*e - c*f)*F^
a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(4*b^(3/2)*d^4*Log[F]^(3/2
)) + (3*f*(d*e - c*f)^2*F^(a + b*(c + d*x)^2))/(2*b*d^4*Log[F]) + (3*f^2*(d
*e - c*f)*F^(a + b*(c + d*x)^2)*(c + d*x))/(2*b*d^4*Log[F]) + (f^3*F^(a + b
*(c + d*x)^2)*(c + d*x)^2)/(2*b*d^4*Log[F]) + ((d*e - c*f)^3*F^a*Sqrt[Pi]*E
rfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(2*Sqrt[b]*d^4*Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(e+fx)^3\,dx = \int \left(\frac{(de-cf)^3F^{a+b(c+dx)^2}}{d^3} + \frac{3f(de-cf)^2F^{a+b(c+dx)^2}(c+dx)}{d^3} + \frac{3f^2(de-cf\cdots}{\cdots}\right.$$

$$= \frac{f^3\int F^{a+b(c+dx)^2}(c+dx)^3\,dx}{d^3} + \frac{(3f^2(de-cf))\int F^{a+b(c+dx)^2}(c+dx)^2\,dx}{d^3} + \frac{(3\cdots}{\cdots}$$

$$= \frac{3f(de-cf)^2F^{a+b(c+dx)^2}}{2bd^4\log(F)} + \frac{3f^2(de-cf)F^{a+b(c+dx)^2}(c+dx)}{2bd^4\log(F)} + \frac{f^3F^{a+b(c+dx)^2}(\cdots}{2bd^4\log(\cdots}$$

$$= -\frac{f^3F^{a+b(c+dx)^2}}{2b^2d^4\log^2(F)} - \frac{3f^2(de-cf)F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{4b^{3/2}d^4\log^{\frac{3}{2}}(F)} + \frac{3f(de\cdots}{\cdots}$$

Mathematica [A]
time = 1.08, size = 148, normalized size = 0.57

$$\frac{F^a\left(\sqrt{b}\,(de-cf)\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)\sqrt{\log(F)}\,(-3f^2+2b(de-cf)^2\log(F))+2fF^{b(c+dx)^2}(-f^2+b(c^2f^2-cdf(3e+fx)+d^2(3e^2+3efx+f^2x^2))\log(F))\right)}{4b^2d^4\log^2(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(e + f*x)^3,x]
```

```
[Out] (F^a*(Sqrt[b]*(d*e - c*f)*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]*Sqr
t[Log[F]]*(-3*f^2 + 2*b*(d*e - c*f)^2*Log[F]) + 2*f*F^(b*(c + d*x)^2)*(-f^2
 + b*(c^2*f^2 - c*d*f*(3*e + f*x) + d^2*(3*e^2 + 3*e*f*x + f^2*x^2))*Log[F]
)))/(4*b^2*d^4*Log[F]^2)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 616 vs. $2(226) = 452$.
time = 0.10, size = 617, normalized size = 2.39

method	result
risch	$-\frac{e^{3}\sqrt{\pi}\, F^{a} \operatorname{erf}\left(-d\sqrt{-b\ln\left(F\right)}\, x+\frac{bc\ln(F)}{\sqrt{-b\ln\left(F\right)}}\right)}{2d\sqrt{-b\ln\left(F\right)}}+\frac{f^{3}x^{2}F^{b\,d^{2}x^{2}}F^{2bcdx}F^{b\,c^{2}}F^{a}}{2\ln(F)b\,d^{2}}-\frac{f^{3}cx\,F^{b\,d^{2}x^{2}}F^{2bcdx}F^{b\,c^{2}}F^{a}}{2d^{3}\ln(F)b}+$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)*(f*x+e)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*e^3*Pi^(1/2)*F^a/d/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F
)/(-b*ln(F))^(1/2))+1/2*f^3/ln(F)/b/d^2*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(
b*c^2)*F^a-1/2*f^3/d^3*c/ln(F)/b*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^
a+1/2*f^3/d^4*c^2/ln(F)/b*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+1/2*f^3
/d^4*c^3*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/
(-b*ln(F))^(1/2))-3/4*f^3/d^4*c/ln(F)/b*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(-
d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))-1/2*f^3/ln(F)^2/b^2/d^4*F^
(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+3/2*e*f^2/ln(F)/b/d^2*x*F^(b*d^2*x^
2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-3/2*e*f^2/d^3*c/ln(F)/b*F^(b*d^2*x^2)*F^(2*b
*c*d*x)*F^(b*c^2)*F^a-3/2*e*f^2/d^3*c^2*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(-
d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))+3/4*e*f^2/ln(F)/b/d^3*Pi^(
1/2)*F^a/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1
/2))+3/2*e^2*f/ln(F)/b/d^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+3/2*e^
2*f*c/d^2*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)
/(-b*ln(F))^(1/2))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 695 vs. $2(226) = 452$.
time = 0.53, size = 695, normalized size = 2.69

$$-\frac{3\left(\frac{\sqrt{\pi}(bd^2x+bcd)bc\left(\operatorname{erf}\left(\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}\right)-1\right)\log(F)^2}{(b\log(F))^{\frac{3}{2}}d^2\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}}-\frac{F^{\frac{(bd^2x+bcd)^2}{bd^2}}b\log(F)}{(b\log(F))^{\frac{3}{2}}d}\right)F^ae^2f}{2\sqrt{b\log(F)}\,d}+\frac{3\left(\frac{\sqrt{\pi}(bd^2x+bcd)b^2c^2\left(\operatorname{erf}\left(\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}\right)-1\right)\log(F)^3}{(b\log(F))^{\frac{5}{2}}d^3\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}}-\frac{2F^{\frac{(bd^2x+bcd)^2}{bd^2}}b^2c\log(F)^2}{(b\log(F))^{\frac{5}{2}}d^2}-\frac{(bd^2x+bcd)^3\Gamma\left(\frac{3}{2},-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)\log(F)^3}{(b\log(F))^{\frac{5}{2}}d^5\left(-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)^{\frac{3}{2}}}\right)F^aef^2}{2\sqrt{b\log(F)}\,d}-\frac{\left(\frac{\sqrt{\pi}(bd^2x+bcd)b^3c^3\left(\operatorname{erf}\left(\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}\right)-1\right)\log(F)^4}{(b\log(F))^{\frac{7}{2}}d^4\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}}-\frac{3F^{\frac{(bd^2x+bcd)^2}{bd^2}}b^3c^2\log(F)^3}{(b\log(F))^{\frac{7}{2}}d^3}-\frac{3(bd^2x+bcd)^3bc\Gamma\left(\frac{3}{2},-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)\log(F)^4}{(b\log(F))^{\frac{7}{2}}d^6\left(-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)^{\frac{3}{2}}}+\frac{b^2\Gamma\left(2,-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)\log(F)^2}{(b\log(F))^{\frac{7}{2}}d^3}\right)F^af^3}{2\sqrt{b\log(F)}\,d}+\frac{\sqrt{\pi}F^{bc^2+a}e^3\operatorname{erf}\left(\sqrt{-b\log(F)}\,dx-\frac{bc\log(F)}{\sqrt{-b\log(F)}}\right)}{2\sqrt{-b\log(F)}\,F^{bc^2}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e)^3,x, algorithm="maxima")
```

```
[Out] -3/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log
(F)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*
d))*F^a*e^2*f/(sqrt(b*log(F))*d) + 3/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*
(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(
5/2)*d^3*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d
)^2/(b*d^2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*ga
mma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^
5*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*e*f^2/(sqrt(b*log(F))*d
) - 1/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*
```

```
log(F)/(b*d^2))) - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d
)^2*log(F)/(b*d^2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/(
(b*log(F))^(7/2)*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*
c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2
*log(F)/(b*d^2))^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))
*log(F)^2/((b*log(F))^(7/2)*d^3))*F^a*f^3/(sqrt(b*log(F))*d) + 1/2*sqrt(pi)
*F^(b*c^2 + a)*e^3*erf(sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt(-b*log(F)))/(s
qrt(-b*log(F))*F^(b*c^2)*d)
```

Fricas [**A**]
time = 0.43, size = 208, normalized size = 0.81

$$-\frac{\sqrt{\pi}\left(3\,cf^{3}-3\,df^{2}e-2\,(bc^{3}f^{3}-3\,bc^{2}df^{2}e+3\,bcd^{2}fe^{2}-bd^{3}e^{3})\log\left(F\right)\right)\sqrt{-bd^{2}\log\left(F\right)}\,F^{a}\operatorname{erf}\left(\frac{\sqrt{-bd^{2}\log\left(F\right)}\,(dx+c)}{d}\right)+2\,\left(df^{3}-(bd^{3}f^{3}x^{2}-bcd^{2}f^{3}x+bc^{2}df^{3}+3\,bd^{3}fe^{2}+3\,(bd^{3}f^{2}x-bcd^{2}f^{2})e)\log\left(F\right)\right)F^{bd^{2}x^{2}+2\,bcdx+bc^{2}+a}}{4\,b^{2}d^{5}\log\left(F\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e)^3,x, algorithm="fricas")
```

```
[Out] -1/4*(sqrt(pi)*(3*c*f^3 - 3*d*f^2*e - 2*(b*c^3*f^3 - 3*b*c^2*d*f^2*e + 3*b*
c*d^2*f*e^2 - b*d^3*e^3)*log(F))*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^2*lo
g(F))*(d*x + c)/d) + 2*(d*f^3 - (b*d^3*f^3*x^2 - b*c*d^2*f^3*x + b*c^2*d*f^
3 + 3*b*d^3*f*e^2 + 3*(b*d^3*f^2*x - b*c*d^2*f^2)*e)*log(F))*F^(b*d^2*x^2 +
 2*b*c*d*x + b*c^2 + a))/(b^2*d^5*log(F)^2)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^{2}}(e+fx)^{3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(f*x+e)**3,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)*(e + f*x)**3, x)
```

Giac [**A**]
time = 2.60, size = 426, normalized size = 1.65

$$-\frac{\sqrt{\pi}\operatorname{erf}\left(-\sqrt{-b\log\left(F\right)}\,d\left(x+\frac{c}{d}\right)\right)e^{\left(a\log\left(F\right)+3\right)}}{2\,\sqrt{-b\log\left(F\right)}\,d}+\frac{3\,\left(\frac{\sqrt{\pi}\,cf\operatorname{erf}\left(-\sqrt{-b\log\left(F\right)}\,d\left(x+\frac{c}{d}\right)\right)e^{\left(a\log\left(F\right)+2\right)}}{\sqrt{-b\log\left(F\right)}\,d}+\frac{fe^{\left(bd^{2}x^{2}\log\left(F\right)+2\,bcdx\log\left(F\right)+bc^{2}\log\left(F\right)+a\log\left(F\right)+2\right)}}{bd\log\left(F\right)}\right)}{2\,d}-\frac{3\,\left(\frac{\sqrt{\pi}\,(2\,bc^{2}f^{2}\log\left(F\right)-f^{2})\operatorname{erf}\left(-\sqrt{-b\log\left(F\right)}\,d\left(x+\frac{c}{d}\right)\right)e^{\left(a\log\left(F\right)+1\right)}}{\sqrt{-b\log\left(F\right)}\,bd\log\left(F\right)}-\frac{2\,\left(df^{2}\left(x+\frac{c}{d}\right)-2\,cf^{2}\right)e^{\left(bd^{2}x^{2}\log\left(F\right)+2\,bcdx\log\left(F\right)+bc^{2}\log\left(F\right)+a\log\left(F\right)+1\right)}}{bd\log\left(F\right)}\right)}{4\,d^{2}}+\frac{\frac{\sqrt{\pi}\,(2\,bc^{3}f^{3}\log\left(F\right)-3\,cf^{3})F^{a}\operatorname{erf}\left(-\sqrt{-b\log\left(F\right)}\,d\left(x+\frac{c}{d}\right)\right)}{\sqrt{-b\log\left(F\right)}\,bd\log\left(F\right)}+\frac{2\,\left(bd^{2}f^{3}\left(x+\frac{c}{d}\right)^{2}\log\left(F\right)-3\,bcdf^{3}\left(x+\frac{c}{d}\right)\log\left(F\right)+3\,bc^{2}f^{3}\log\left(F\right)-f^{3}\right)e^{\left(bd^{2}x^{2}\log\left(F\right)+2\,bcdx\log\left(F\right)+bc^{2}\log\left(F\right)+a\log\left(F\right)\right)}}{b^{2}d\log\left(F\right)^{2}}}{4\,d^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e)^3,x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F) + 3)/(sqrt(-b*l
og(F))*d) + 3/2*(sqrt(pi)*c*f*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F)
 + 2)/(sqrt(-b*log(F))*d) + f*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^
2*log(F) + a*log(F) + 2)/(b*d*log(F)))/d - 3/4*(sqrt(pi)*(2*b*c^2*f^2*log(F
```

```
) - f^2)*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F) + 1)/(sqrt(-b*log(F)
)*b*d*log(F)) - 2*(d*f^2*(x + c/d) - 2*c*f^2)*e^(b*d^2*x^2*log(F) + 2*b*c*d
*x*log(F) + b*c^2*log(F) + a*log(F) + 1)/(b*d*log(F)))/d^2 + 1/4*(sqrt(pi)*
(2*b*c^3*f^3*log(F) - 3*c*f^3)*F^a*erf(-sqrt(-b*log(F))*d*(x + c/d))/(sqrt(
-b*log(F))*b*d*log(F)) + 2*(b*d^2*f^3*(x + c/d)^2*log(F) - 3*b*c*d*f^3*(x +
 c/d)*log(F) + 3*b*c^2*f^3*log(F) - f^3)*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*lo
g(F) + b*c^2*log(F) + a*log(F))/(b^2*d*log(F)^2))/d^3
```

Mupad [B]
time = 3.76, size = 313, normalized size = 1.21

$$\frac{F^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln(F)\,d^2+b\,c\,\ln(F)\,d}{\sqrt{b\,d^2\,\ln\left(F\right)}}\right)\,\left(-2\,b\,\ln\left(F\right)\,c^3\,f^3+6\,b\,\ln\left(F\right)\,c^2\,d\,e\,f^2-6\,b\,\ln\left(F\right)\,c\,d^2\,e^2\,f+3\,c\,f^3+2\,b\,\ln\left(F\right)\,d^3\,e^3-3\,d\,e\,f^2\right)}{4\,b\,d^3\,\ln\left(F\right)\,\sqrt{b\,d^2\,\ln\left(F\right)}}-F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,\left(\frac{f^3}{2\,b^2\,d^4\,{\ln\left(F\right)}^2}-\frac{3\,e^2\,f}{2\,b\,d^2\,\ln\left(F\right)}-\frac{c^2\,f^3}{2\,b\,d^4\,\ln\left(F\right)}+\frac{3\,c\,e\,f^2}{2\,b\,d^3\,\ln\left(F\right)}\right)-\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,x\,\left(c\,f^3-3\,d\,e\,f^2\right)}{2\,b\,d^3\,\ln\left(F\right)}+\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,f^3\,x^2}{2\,b\,d^2\,\ln\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(e + f*x)^3,x)
```

```
[Out] (F^a*pi^(1/2)*erfi((b*c*d*log(F) + b*d^2*x*log(F))/(b*d^2*log(F))^(1/2))*(3
*c*f^3 - 3*d*e*f^2 - 2*b*c^3*f^3*log(F) + 2*b*d^3*e^3*log(F) - 6*b*c*d^2*e^
2*f*log(F) + 6*b*c^2*d*e*f^2*log(F)))/(4*b*d^3*log(F)*(b*d^2*log(F))^(1/2))
 - F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*(f^3/(2*b^2*d^4*log(F)^2) - (3
*e^2*f)/(2*b*d^2*log(F)) - (c^2*f^3)/(2*b*d^4*log(F)) + (3*c*e*f^2)/(2*b*d^
3*log(F))) - (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*x*(c*f^3 - 3*d*e*f^
2))/(2*b*d^3*log(F)) + (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*f^3*x^2)/
(2*b*d^2*log(F))
```

3.385 $\int F^{a+b(c+dx)^2}(e+fx)^2\,dx$

Optimal. Leaf size=170

$$-\frac{f^2F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{4b^{3/2}d^3\log^{\frac{3}{2}}(F)}+\frac{f(de-cf)F^{a+b(c+dx)^2}}{bd^3\log(F)}+\frac{f^2F^{a+b(c+dx)^2}(c+dx)}{2bd^3\log(F)}+\frac{(de-cf)^2F^a\sqrt{\pi}}{2}$$

```
[Out] f*(-c*f+d*e)*F^(a+b*(d*x+c)^2)/b/d^3/ln(F)+1/2*f^2*F^(a+b*(d*x+c)^2)*(d*x+c
)/b/d^3/ln(F)-1/4*f^2*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*Pi^(1/2)/b^(3/2
)/d^3/ln(F)^(3/2)+1/2*(-c*f+d*e)^2*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*Pi
^(1/2)/d^3/b^(1/2)/ln(F)^(1/2)
```

Rubi [A]

time = 0.20, antiderivative size = 170, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.190$, Rules used = {2258, 2235, 2240, 2243}

$$-\frac{\sqrt{\pi}\,f^2F^a\mathrm{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{4b^{3/2}d^3\log^{\frac{3}{2}}(F)}+\frac{\sqrt{\pi}\,F^a(de-cf)^2\mathrm{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{2\sqrt{b}\,d^3\sqrt{\log(F)}}+\frac{f(de-cf)F^{a+b(c+dx)^2}}{bd^3\log(F)}+\frac{f^2(c+dx)F^{a+b(c+dx)^2}}{2bd^3\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(e + f*x)^2,x]
```

```
[Out] -1/4*(f^2*F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(b^(3/2)*d^3*L
og[F]^(3/2)) + (f*(d*e - c*f)*F^(a + b*(c + d*x)^2))/(b*d^3*Log[F]) + (f^2*
F^(a + b*(c + d*x)^2)*(c + d*x))/(2*b*d^3*Log[F]) + ((d*e - c*f)^2*F^a*Sqrt
[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(2*Sqrt[b]*d^3*Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
```

```
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(e+fx)^2\,dx = \int \left(\frac{(de-cf)^2F^{a+b(c+dx)^2}}{d^2}+\frac{2f(de-cf)F^{a+b(c+dx)^2}(c+dx)}{d^2}+\frac{f^2F^{a+b(c+dx)^2}(c\right.$$
$$=\frac{f^2\int F^{a+b(c+dx)^2}(c+dx)^2\,dx}{d^2}+\frac{(2f(de-cf))\int F^{a+b(c+dx)^2}(c+dx)\,dx}{d^2}+\frac{(de-}{}$$
$$=\frac{f(de-cf)F^{a+b(c+dx)^2}}{bd^3\log(F)}+\frac{f^2F^{a+b(c+dx)^2}(c+dx)}{2bd^3\log(F)}+\frac{(de-cf)^2F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c\right.}{2\sqrt{b}\,d^3\sqrt{\log(}}$$
$$=-\frac{f^2F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{4b^{3/2}d^3\log^{\frac{3}{2}}(F)}+\frac{f(de-cf)F^{a+b(c+dx)^2}}{bd^3\log(F)}+\frac{f^2F^{a+b(c+}}{2bd^3\,\mathrm{l}}$$

Mathematica [A]
time = 1.00, size = 105, normalized size = 0.62

$$\frac{F^a\left(2\sqrt{b}\,fF^{b(c+dx)^2}(2de-cf+dfx)\sqrt{\log(F)}+\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)(-f^2+2b(de-cf)^2\log(F))\right)}{4b^{3/2}d^3\log^{\frac{3}{2}}(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(e + f*x)^2,x]
```

```
[Out] (F^a*(2*Sqrt[b]*f*F^(b*(c + d*x)^2)*(2*d*e - c*f + d*f*x)*Sqrt[Log[F]] + Sq
rt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]*(-f^2 + 2*b*(d*e - c*f)^2*Log[F
]))/(4*b^(3/2)*d^3*Log[F]^(3/2))
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 323 vs. $2(144) = 288$.
time = 0.08, size = 324, normalized size = 1.91

method	result

risch	$-\frac{e^{2}\sqrt{\pi}\, F^{a} \operatorname{erf}\left(-d \sqrt{-b \ln \left(F\right)}\, x+\frac{b c \ln \left(F\right)}{\sqrt{-b \ln \left(F\right)}}\right)}{2 d \sqrt{-b \ln \left(F\right)}}+\frac{f^{2} x \,F^{b \,d^{2} x^{2}} F^{2 b c d x} F^{b \,c^{2}} F^{a}}{2 \ln \left(F\right) b \,d^{2}}-\frac{f^{2} c \,F^{b \,d^{2} x^{2}} F^{2 b c d x} F^{b \,c^{2}} F^{a}}{2 d^{3} \ln \left(F\right) b}-$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)*(f*x+e)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*e^2*Pi^(1/2)*F^a/d/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F
)/(-b*ln(F))^(1/2))+1/2*f^2/ln(F)/b/d^2*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*
c^2)*F^a-1/2*f^2/d^3*c/ln(F)/b*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-1/
2*f^2/d^3*c^2*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c*l
n(F)/(-b*ln(F))^(1/2))+1/4*f^2/ln(F)/b/d^3*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*er
f(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))+e*f/ln(F)/b/d^2*F^(b*d^
2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+e*f*c/d^2*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*
erf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 422 vs. $2(144) = 288$.
time = 0.45, size = 422, normalized size = 2.48

$$-\frac{\left(\frac{\sqrt{\pi}\,(bd^2x+bcd)bc\left(\operatorname{erf}\left(\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}\right)-1\right)\log(F)^2}{(b\log(F))^{\frac{3}{2}}d^2\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}}-\frac{F^{\frac{(bd^2x+bcd)^2}{bd^2}}b\log(F)}{(b\log(F))^{\frac{3}{2}}d}\right)F^aef}{\sqrt{b\log(F)}\,d}+\frac{\left(\frac{\sqrt{\pi}\,(bd^2x+bcd)b^2c^2\left(\operatorname{erf}\left(\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}\right)-1\right)\log(F)^3}{(b\log(F))^{\frac{5}{2}}d^3\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}}-\frac{2F^{\frac{(bd^2x+bcd)^2}{bd^2}}b^2c\log(F)^2}{(b\log(F))^{\frac{5}{2}}d^2}-\frac{(bd^2x+bcd)^3\Gamma\left(\frac{3}{2},-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)\log(F)^3}{(b\log(F))^{\frac{5}{2}}d^5\left(-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}\right)^{\frac{3}{2}}}\right)F^af^2}{2\sqrt{b\log(F)}\,d}+\frac{\sqrt{\pi}\,F^{bc^2+a}e^2\operatorname{erf}\left(\sqrt{-b\log(F)}\,dx-\frac{bc\log(F)}{\sqrt{-b\log(F)}}\right)}{2\sqrt{-b\log(F)}\,F^{bc^2}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e)^2,x, algorithm="maxima")
```

```
[Out] -(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d
^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*d))*
F^a*e*f/(sqrt(b*log(F))*d) + 1/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(erf(s
qrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2)*d
^3*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2/(b
*d^2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma(3/
2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(-(b
*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*f^2/(sqrt(b*log(F))*d) + 1/2*
sqrt(pi)*F^(b*c^2 + a)*e^2*erf(sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt(-b*log
(F)))/(sqrt(-b*log(F))*F^(b*c^2)*d)
```

Fricas [A]
time = 0.42, size = 136, normalized size = 0.80

$$\frac{\sqrt{\pi}\,\sqrt{-bd^2\log(F)}\,(f^2-2\,(bc^2f^2-2\,bcdfe+bd^2e^2)\log(F))F^a\operatorname{erf}\left(\frac{\sqrt{-bd^2\log(F)}\,(dx+c)}{d}\right)+2\,(bd^2f^2x-bcdf^2+2\,bd^2fe)F^{bd^2x^2+2\,bcdx+bc^2+a}\log(F)}{4\,b^2d^4\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e)^2,x, algorithm="fricas")
```

```
[Out] 1/4*(sqrt(pi)*sqrt(-b*d^2*log(F))*(f^2 - 2*(b*c^2*f^2 - 2*b*c*d*f*e + b*d^2
*e^2)*log(F))*F^a*erf(sqrt(-b*d^2*log(F))*(d*x + c)/d) + 2*(b*d^2*f^2*x - b
*c*d*f^2 + 2*b*d^2*f*e)*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)*log(F))/(b^2*
d^4*log(F)^2)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^2}(e+fx)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(f*x+e)**2,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)*(e + f*x)**2, x)
```

Giac [A]
time = 2.60, size = 258, normalized size = 1.52

$$-\frac{\sqrt{\pi}\,\operatorname{erf}\left(-\sqrt{-b\log\left(F\right)}\,d\left(x+\frac{c}{d}\right)\right)e^{\left(a\log\left(F\right)+2\right)}}{2\sqrt{-b\log\left(F\right)}\,d}+\frac{\frac{\sqrt{\pi}\,cf\operatorname{erf}\left(-\sqrt{-b\log\left(F\right)}\,d\left(x+\frac{c}{d}\right)\right)e^{\left(a\log\left(F\right)+1\right)}}{\sqrt{-b\log\left(F\right)}\,d}+\frac{fe^{\left(bd^2x^2\log\left(F\right)+2\,bcdx\log\left(F\right)+bc^2\log\left(F\right)+a\log\left(F\right)+1\right)}}{bd\log\left(F\right)}}{d}-\frac{\frac{\sqrt{\pi}\left(2\,bc^2f^2\log\left(F\right)-f^2\right)F^a\operatorname{erf}\left(-\sqrt{-b\log\left(F\right)}\,d\left(x+\frac{c}{d}\right)\right)}{\sqrt{-b\log\left(F\right)}\,bd\log\left(F\right)}-\frac{2\left(df^2\left(x+\frac{c}{d}\right)-2\,cf^2\right)e^{\left(bd^2x^2\log\left(F\right)+2\,bcdx\log\left(F\right)+bc^2\log\left(F\right)+a\log\left(F\right)\right)}}{bd\log\left(F\right)}}{4\,d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e)^2,x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F) + 2)/(sqrt(-b*l
og(F))*d) + (sqrt(pi)*c*f*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F) + 1
)/(sqrt(-b*log(F))*d) + f*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^2*lo
g(F) + a*log(F) + 1)/(b*d*log(F)))/d - 1/4*(sqrt(pi)*(2*b*c^2*f^2*log(F) -
f^2)*F^a*erf(-sqrt(-b*log(F))*d*(x + c/d))/(sqrt(-b*log(F))*b*d*log(F)) - 2
*(d*f^2*(x + c/d) - 2*c*f^2)*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^2
*log(F) + a*log(F))/(b*d*log(F)))/d^2
```

Mupad [B]
time = 3.82, size = 194, normalized size = 1.14

$$\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,f^2\,x}{2\,b\,d^2\,\ln\left(F\right)}-\frac{F^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln\left(F\right)\,d^2+b\,c\,\ln\left(F\right)\,d}{\sqrt{b\,d^2\,\ln\left(F\right)}}\right)\,\left(-2\,b\,\ln\left(F\right)\,c^2\,f^2+4\,b\,\ln\left(F\right)\,c\,d\,e\,f-2\,b\,\ln\left(F\right)\,d^2\,e^2+f^2\right)}{4\,b\,d^2\,\ln\left(F\right)\,\sqrt{b\,d^2\,\ln\left(F\right)}}-F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,\left(\frac{c\,f^2}{2\,b\,d^3\,\ln\left(F\right)}-\frac{e\,f}{b\,d^2\,\ln\left(F\right)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(e + f*x)^2,x)
```

```
[Out] (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*f^2*x)/(2*b*d^2*log(F)) - (F^a*p
i^(1/2)*erfi((b*c*d*log(F) + b*d^2*x*log(F))/(b*d^2*log(F))^(1/2))*(f^2 - 2
*b*c^2*f^2*log(F) - 2*b*d^2*e^2*log(F) + 4*b*c*d*e*f*log(F)))/(4*b*d^2*log(
F)*(b*d^2*log(F))^(1/2)) - F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*((c*f^
2)/(2*b*d^3*log(F)) - (e*f)/(b*d^2*log(F)))
```

3.386 $\int F^{a+b(c+dx)^2}(e+fx)\,dx$

Optimal. Leaf size=81

$$\frac{fF^{a+b(c+dx)^2}}{2bd^2\log(F)}+\frac{(de-cf)F^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{2\sqrt{b}\,d^2\sqrt{\log(F)}}$$

```
[Out] 1/2*f*F^(a+b*(d*x+c)^2)/b/d^2/ln(F)+1/2*(-c*f+d*e)*F^a*erfi((d*x+c)*b^(1/2)
*ln(F)^(1/2))*Pi^(1/2)/d^2/b^(1/2)/ln(F)^(1/2)
```

Rubi [A]
time = 0.09, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}=0.158$, Rules used = {2258, 2235, 2240}

$$\frac{\sqrt{\pi}\,F^a(de-cf)\text{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{2\sqrt{b}\,d^2\sqrt{\log(F)}}+\frac{fF^{a+b(c+dx)^2}}{2bd^2\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(e + f*x),x]
```

```
[Out] (f*F^(a + b*(c + d*x)^2))/(2*b*d^2*Log[F]) + ((d*e - c*f)*F^a*Sqrt[Pi]*Erfi
[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(2*Sqrt[b]*d^2*Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$
\begin{aligned}
\int F^{a+b(c+dx)^2}(e+fx)\,dx &= \int \left(\frac{(de-cf)F^{a+b(c+dx)^2}}{d}+\frac{fF^{a+b(c+dx)^2}(c+dx)}{d}\right)dx \\
&= \frac{f\int F^{a+b(c+dx)^2}(c+dx)\,dx}{d}+\frac{(de-cf)\int F^{a+b(c+dx)^2}\,dx}{d} \\
&= \frac{fF^{a+b(c+dx)^2}}{2bd^2\log(F)}+\frac{(de-cf)F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{2\sqrt{b}\,d^2\sqrt{\log(F)}}
\end{aligned}
$$

Mathematica [A]
time = 0.55, size = 74, normalized size = 0.91

$$
\frac{F^a\left(fF^{b(c+dx)^2}+\sqrt{b}\,(de-cf)\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)\sqrt{\log(F)}\right)}{2bd^2\log(F)}
$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(e + f*x),x]
```

```
[Out] (F^a*(f*F^(b*(c + d*x)^2) + Sqrt[b]*(d*e - c*f)*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]*Sqrt[Log[F]]))/(2*b*d^2*Log[F])
```

Maple [A]
time = 0.04, size = 132, normalized size = 1.63

method	result
risch	$-\frac{e\sqrt{\pi}\,F^a\,\mathrm{erf}\left(-d\sqrt{-b\ln(F)}\,x+\frac{bc\ln(F)}{\sqrt{-b\ln(F)}}\right)}{2d\sqrt{-b\ln(F)}}+\frac{f\,F^{b\,d^2x^2}F^{2bcdx}F^{b\,c^2}F^a}{2\ln(F)b\,d^2}+\frac{fc\sqrt{\pi}\,F^a\,\mathrm{erf}\left(-d\sqrt{-b\ln(F)}\right.}{2d^2\sqrt{-b\ln(}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)*(f*x+e),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*e*Pi^(1/2)*F^a/d/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c*ln(F)/
(-b*ln(F))^(1/2))+1/2*f/ln(F)/b/d^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F
^a+1/2*f*c/d^2*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(1/2)*x+b*c*
ln(F)/(-b*ln(F))^(1/2))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 195 vs. 2(67) = 134.

time = 0.36, size = 195, normalized size = 2.41

$$-\frac{\left(\frac{\sqrt{\pi}\,(bd^2x+bcd)bc\left(\operatorname{erf}\left(\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}\right)-1\right)\log(F)^2}{(b\log(F))^{\frac{3}{2}}d^2\sqrt{-\frac{(bd^2x+bcd)^2\log(F)}{bd^2}}}-\frac{F^{\frac{(bd^2x+bcd)^2}{bd^2}}b\log(F)}{(b\log(F))^{\frac{3}{2}}d}\right)F^af}{2\sqrt{b\log(F)}\,d}+\frac{\sqrt{\pi}\,F^{bc^2+a}e\operatorname{erf}\left(\sqrt{-b\log(F)}\,dx-\frac{bc\log(F)}{\sqrt{-b\log(F)}}\right)}{2\sqrt{-b\log(F)}\,F^{bc^2}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e),x, algorithm="maxima")
```

```
[Out] -1/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log
(F)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*
d))*F^a*f/(sqrt(b*log(F))*d) + 1/2*sqrt(pi)*F^(b*c^2 + a)*e*erf(sqrt(-b*log
(F))*d*x - b*c*log(F)/sqrt(-b*log(F)))/(sqrt(-b*log(F))*F^(b*c^2)*d)
```

Fricas [A]
time = 0.39, size = 85, normalized size = 1.05

$$\frac{\sqrt{\pi}\,\sqrt{-bd^2\log(F)}\,(cf-de)F^a\operatorname{erf}\left(\frac{\sqrt{-bd^2\log(F)}\,(dx+c)}{d}\right)+F^{bd^2x^2+2\,bcdx+bc^2+a}df}{2\,bd^3\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e),x, algorithm="fricas")
```

```
[Out] 1/2*(sqrt(pi)*sqrt(-b*d^2*log(F))*(c*f - d*e)*F^a*erf(sqrt(-b*d^2*log(F))*(
d*x + c)/d) + F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)*d*f)/(b*d^3*log(F))
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^2}(e+fx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(f*x+e),x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)*(e + f*x), x)
```

Giac [A]
time = 3.21, size = 127, normalized size = 1.57

$$-\frac{\sqrt{\pi}\operatorname{erf}\left(-\sqrt{-b\log(F)}\,d\left(x+\frac{c}{d}\right)\right)e^{(a\log(F)+1)}}{2\sqrt{-b\log(F)}\,d}+\frac{\frac{\sqrt{\pi}\,F^acf\operatorname{erf}\left(-\sqrt{-b\log(F)}\,d\left(x+\frac{c}{d}\right)\right)}{\sqrt{-b\log(F)}\,d}+\frac{fe^{\left(bd^2x^2\log(F)+2\,bcdx\log(F)+bc^2\log(F)+a\log(F)\right)}}{bd\log(F)}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F) + 1)/(sqrt(-b*l
og(F))*d) + 1/2*(sqrt(pi)*F^a*c*f*erf(-sqrt(-b*log(F))*d*(x + c/d))/(sqrt(-
b*log(F))*d) + f*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^2*log(F) + a*
log(F))/(b*d*log(F)))/d
```

Mupad [B]
time = 3.63, size = 96, normalized size = 1.19

$$\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,f}{2\,b\,d^2\,\ln\left(F\right)}-\frac{F^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln\left(F\right)\,d^2+b\,c\,\ln\left(F\right)\,d}{\sqrt{b\,d^2\,\ln\left(F\right)}}\right)\,\left(c\,f-d\,e\right)}{2\,d\,\sqrt{b\,d^2\,\ln\left(F\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(e + f*x),x)
```

```
[Out] (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*f)/(2*b*d^2*log(F)) - (F^a*pi^(1
/2)*erfi((b*c*d*log(F) + b*d^2*x*log(F))/(b*d^2*log(F))^(1/2))*(c*f - d*e))
/(2*d*(b*d^2*log(F))^(1/2))
```

3.387 $\int F^{a+b(c+dx)^2}\,dx$

Optimal. Leaf size=44

$$\frac{F^a\sqrt{\pi}\,\operatorname{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{2\sqrt{b}\,d\sqrt{\log(F)}}$$

```
[Out] 1/2*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*Pi^(1/2)/d/b^(1/2)/ln(F)^(1/2)
```

Rubi [A]
time = 0.01, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = $\{2235\}$

$$\frac{\sqrt{\pi}\,F^a\text{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{2\sqrt{b}\,d\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2),x]
```

```
[Out] (F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(2*Sqrt[b]*d*Sqrt[Log[F
]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rubi steps

$$\int F^{a+b(c+dx)^2}\,dx = \frac{F^a\sqrt{\pi}\,\operatorname{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{2\sqrt{b}\,d\sqrt{\log(F)}}$$

Mathematica [A]
time = 0.01, size = 44, normalized size = 1.00

$$\frac{F^a\sqrt{\pi}\,\operatorname{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{2\sqrt{b}\,d\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2),x]
```

```
[Out] (F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(2*Sqrt[b]*d*Sqrt[Log[F
]])
```

Maple [A]
time = 0.01, size = 58, normalized size = 1.32

method	result	size
risch	$-\frac{\sqrt{\pi}\, F^{b\,c^{2}+a} F^{-b\,c^{2}} \operatorname{erf}\left(-d\sqrt{-b\ln\left(F\right)}\, x+\frac{b c \ln\left(F\right)}{\sqrt{-b\ln\left(F\right)}}\right)}{2 d\sqrt{-b\ln\left(F\right)}}$	58

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*Pi^(1/2)*F^(b*c^2+a)*F^(-b*c^2)/d/(-b*ln(F))^(1/2)*erf(-d*(-b*ln(F))^(
1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))
```

Maxima [A]
time = 0.28, size = 58, normalized size = 1.32

$$\frac{\sqrt{\pi}\, F^{bc^{2}+a} \operatorname{erf}\left(\sqrt{-b\log\left(F\right)}\, dx-\frac{bc\log\left(F\right)}{\sqrt{-b\log\left(F\right)}}\right)}{2\,\sqrt{-b\log\left(F\right)}\, F^{bc^{2}} d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(pi)*F^(b*c^2 + a)*erf(sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt(-b*log
(F)))/(sqrt(-b*log(F))*F^(b*c^2)*d)
```

Fricas [A]
time = 0.37, size = 48, normalized size = 1.09

$$-\frac{\sqrt{\pi}\,\sqrt{-bd^{2}\log\left(F\right)}\, F^{a} \operatorname{erf}\left(\frac{\sqrt{-bd^{2}\log\left(F\right)}\,(dx+c)}{d}\right)}{2\,bd^{2}\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^2*log(F))*(d*x + c)/d)/
(b*d^2*log(F))
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2),x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2), x)
```

Giac [**A**]
time = 2.18, size = 36, normalized size = 0.82

$$-\frac{\sqrt{\pi}\,F^{a}\operatorname{erf}\left(-\sqrt{-b\log\left(F\right)}\,d\left(x+\frac{c}{d}\right)\right)}{2\,\sqrt{-b\log\left(F\right)}\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*F^a*erf(-sqrt(-b*log(F))*d*(x + c/d))/(sqrt(-b*log(F))*d)
```

Mupad [**B**]
time = 3.40, size = 48, normalized size = 1.09

$$-\frac{F^{a}\,\sqrt{\pi}\,\operatorname{erf}\left(\frac{1\mathrm{i}\,b\,x\,\ln\left(F\right)\,d^2+1\mathrm{i}\,b\,c\,\ln\left(F\right)\,d}{\sqrt{b\,d^2\,\ln\left(F\right)}}\right)\,1\mathrm{i}}{2\,\sqrt{b\,d^2\,\ln\left(F\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2),x)
```

```
[Out] -(F^a*pi^(1/2)*erf((b*c*d*log(F)*1i + b*d^2*x*log(F)*1i)/(b*d^2*log(F))^(1/
2))*1i)/(2*(b*d^2*log(F))^(1/2))
```

3.388 $\int \frac{F^{a+b(c+dx)^2}}{e+fx} dx$

Optimal. Leaf size=24

$$\text{Int}\left(\frac{F^{a+b(c+dx)^2}}{e+fx},x\right)$$

```
[Out] Unintegrable(F^(a+b*(d*x+c)^2)/(f*x+e),x)
```

Rubi [A]
time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{F^{a+b(c+dx)^2}}{e+fx} dx$$

Verification is not applicable to the result.

```
[In] Int[F^(a + b*(c + d*x)^2)/(e + f*x),x]
[Out] Defer[Int][F^(a + b*(c + d*x)^2)/(e + f*x), x]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{e+fx} dx = \int \frac{F^{a+b(c+dx)^2}}{e+fx} dx$$

Mathematica [A]
time = 0.79, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^2}}{e+fx} dx$$

Verification is not applicable to the result.

```
[In] Integrate[F^(a + b*(c + d*x)^2)/(e + f*x),x]
[Out] Integrate[F^(a + b*(c + d*x)^2)/(e + f*x), x]
```

Maple [A]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(dx+c)^2}}{fx+e} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)/(f*x+e),x)
```

```
[Out] int(F^(a+b*(d*x+c)^2)/(f*x+e),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(f*x+e),x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(f*x + e), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(f*x+e),x, algorithm="fricas")
```

```
[Out] integral(F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)/(f*x + e), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^2}}{e+fx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(f*x+e),x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)/(e + f*x), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(f*x+e),x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(f*x + e), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{F^{a+b(c+dx)^2}}{e+fx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(e + f*x),x)
[Out] int(F^(a + b*(c + d*x)^2)/(e + f*x), x)
```

3.389 $\int \frac{F^{a+b(c+dx)^2}}{(e+fx)^2} dx$

Optimal. Leaf size=109

$$-\frac{F^{a+b(c+dx)^2}}{f(e+fx)}+\frac{\sqrt{b}\, dF^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)\sqrt{\log(F)}}{f^2}-\frac{2bd(de-cf)\log(F)\text{Int}\left(\frac{F^{a+b(c+dx)^2}}{e+fx},x\right)}{f^2}$$

```
[Out] -F^(a+b*(d*x+c)^2)/f/(f*x+e)+d*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*b^(1/2
)*Pi^(1/2)*ln(F)^(1/2)/f^2-2*b*d*(-c*f+d*e)*ln(F)*Unintegrable(F^(a+b*(d*x+
c)^2)/(f*x+e),x)/f^2
```

Rubi [A]
time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{F^{a+b(c+dx)^2}}{(e+fx)^2} dx$$

Verification is not applicable to the result.

```
[In] Int[F^(a + b*(c + d*x)^2)/(e + f*x)^2,x]
```

```
[Out] -(F^(a + b*(c + d*x)^2)/(f*(e + f*x))) + (Sqrt[b]*d*F^a*Sqrt[Pi]*Erfi[Sqrt[
b]*(c + d*x)*Sqrt[Log[F]]]*Sqrt[Log[F]])/f^2 - (2*b*d*(d*e - c*f)*Log[F]*De
fer[Int][F^(a + b*(c + d*x)^2)/(e + f*x), x])/f^2
```

Rubi steps

$$\begin{aligned}\int \frac{F^{a+b(c+dx)^2}}{(e+fx)^2} dx &= -\frac{F^{a+b(c+dx)^2}}{f(e+fx)}+\frac{\left(2bd^2\log(F)\right)\int F^{a+b(c+dx)^2}\, dx}{f^2}-\frac{\left(2bd(de-cf)\log(F)\right)\int \frac{F^{a+b(c+dx)^2}}{e+fx}\, dx}{f^2}\\ &= -\frac{F^{a+b(c+dx)^2}}{f(e+fx)}+\frac{\sqrt{b}\, dF^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)\sqrt{\log(F)}}{f^2}-\frac{(2bd(de-cf)\log(F))\int \frac{F^{a+b(c+dx)^2}}{e+fx}\, dx}{f^2}\end{aligned}$$

Mathematica [A]
time = 1.58, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^2}}{(e+fx)^2} dx$$

Verification is not applicable to the result.

```
[In] Integrate[F^(a + b*(c + d*x)^2)/(e + f*x)^2,x]
```

```
[Out] Integrate[F^(a + b*(c + d*x)^2)/(e + f*x)^2, x]
```

Maple [A]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(dx+c)^2}}{(fx+e)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)/(f*x+e)^2,x)
```

```
[Out] int(F^(a+b*(d*x+c)^2)/(f*x+e)^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(f*x+e)^2,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(f*x + e)^2, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(f*x+e)^2,x, algorithm="fricas")
```

```
[Out] integral(F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)/(f^2*x^2 + 2*f*x*e + e^2), x
)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^2}}{(e+fx)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(f*x+e)**2,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)/(e + f*x)**2, x)
```

Giac [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(f*x+e)^2,x, algorithm="giac")
[Out] integrate(F^((d*x + c)^2*b + a)/(f*x + e)^2, x)
```

Mupad [**A**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{F^{a+b\,{\left(c+d\,x\right)}^2}}{{\left(e+f\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(e + f*x)^2,x)
[Out] int(F^(a + b*(c + d*x)^2)/(e + f*x)^2, x)
```

3.390 $\int \frac{F^{a+b(c+dx)^2}}{(e+fx)^3} dx$

Optimal. Leaf size=200

$$-\frac{F^{a+b(c+dx)^2}}{2f(e+fx)^2}+\frac{bd(de-cf)F^{a+b(c+dx)^2}\log(F)}{f^3(e+fx)}-\frac{b^{3/2}d^2(de-cf)F^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)\log^{\frac{3}{2}}(F)}{f^4}$$

```
[Out] -1/2*F^(a+b*(d*x+c)^2)/f/(f*x+e)^2+b*d*(-c*f+d*e)*F^(a+b*(d*x+c)^2)*ln(F)/f
^3/(f*x+e)-b^(3/2)*d^2*(-c*f+d*e)*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*ln(
F)^(3/2)*Pi^(1/2)/f^4+b*d^2*ln(F)*Unintegrable(F^(a+b*(d*x+c)^2)/(f*x+e),x)
/f^2+2*b^2*d^2*(-c*f+d*e)^2*ln(F)^2*Unintegrable(F^(a+b*(d*x+c)^2)/(f*x+e),
x)/f^4
```

Rubi [A]
time = 0.21, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{F^{a+b(c+dx)^2}}{(e+fx)^3} dx$$

Verification is not applicable to the result.

```
[In] Int[F^(a + b*(c + d*x)^2)/(e + f*x)^3,x]
```

```
[Out] -1/2*F^(a + b*(c + d*x)^2)/(f*(e + f*x)^2) + (b*d*(d*e - c*f)*F^(a + b*(c +
 d*x)^2)*Log[F])/(f^3*(e + f*x)) - (b^(3/2)*d^2*(d*e - c*f)*F^a*Sqrt[Pi]*Er
fi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]*Log[F]^(3/2))/f^4 + (b*d^2*Log[F]*Defer[
Int][F^(a + b*(c + d*x)^2)/(e + f*x), x])/f^2 + (2*b^2*d^2*(d*e - c*f)^2*Lo
g[F]^2*Defer[Int][F^(a + b*(c + d*x)^2)/(e + f*x), x])/f^4
```

Rubi steps

$$\begin{aligned}\int \frac{F^{a+b(c+dx)^2}}{(e+fx)^3} dx &= -\frac{F^{a+b(c+dx)^2}}{2f(e+fx)^2}+\frac{\left(bd^2\log(F)\right)\int \frac{F^{a+b(c+dx)^2}}{e+fx}\,dx}{f^2}-\frac{\left(bd(de-cf)\log(F)\right)\int \frac{F^{a+b(c+dx)^2}}{(e+fx)^2}\,dx}{f^2}\\ &= -\frac{F^{a+b(c+dx)^2}}{2f(e+fx)^2}+\frac{bd(de-cf)F^{a+b(c+dx)^2}\log(F)}{f^3(e+fx)}+\frac{\left(bd^2\log(F)\right)\int \frac{F^{a+b(c+dx)^2}}{e+fx}\,dx}{f^2}-\frac{(2b^2d^3}{}\\ &= -\frac{F^{a+b(c+dx)^2}}{2f(e+fx)^2}+\frac{bd(de-cf)F^{a+b(c+dx)^2}\log(F)}{f^3(e+fx)}-\frac{b^{3/2}d^2(de-cf)F^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,(c+d\right.}{f^4}\end{aligned}$$

Mathematica [A]
time = 1.64, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^2}}{(e+fx)^3}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[F^(a + b*(c + d*x)^2)/(e + f*x)^3,x]
[Out] Integrate[F^(a + b*(c + d*x)^2)/(e + f*x)^3, x]
```

Maple [A]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(dx+c)^2}}{(fx+e)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)/(f*x+e)^3,x)
[Out] int(F^(a+b*(d*x+c)^2)/(f*x+e)^3,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(f*x+e)^3,x, algorithm="maxima")
[Out] integrate(F^((d*x + c)^2*b + a)/(f*x + e)^3, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(f*x+e)^3,x, algorithm="fricas")
[Out] integral(F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)/(f^3*x^3 + 3*f^2*x^2*e + 3*f
*x*e^2 + e^3), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^2}}{(e+fx)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(f*x+e)**3,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)/(e + f*x)**3, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(f*x+e)^3,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(f*x + e)^3, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{F^{a+b\,{\left(c+d\,x\right)}^2}}{{\left(e+f\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(e + f*x)^3,x)
```

```
[Out] int(F^(a + b*(c + d*x)^2)/(e + f*x)^3, x)
```

3.391 $\int e^{e(c+dx)^3}(a+bx)^3\,dx$

Optimal. Leaf size=177

$$-\frac{b^2(bc-ad)e^{e(c+dx)^3}}{d^4e}+\frac{(bc-ad)^3(c+dx)\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{3d^4\sqrt[3]{-e(c+dx)^3}}-\frac{b(bc-ad)^2(c+dx)^2\Gamma\left(\frac{2}{3},-e(c+dx)^3\right)}{d^4\left(-e(c+dx)^3\right)^{2/3}}-\frac{b^3(c}{}$$

```
[Out] -b^2*(-a*d+b*c)*exp(e*(d*x+c)^3)/d^4/e+1/3*(-a*d+b*c)^3*(d*x+c)*GAMMA(1/3,-
e*(d*x+c)^3)/d^4/(-e*(d*x+c)^3)^(1/3)-b*(-a*d+b*c)^2*(d*x+c)^2*GAMMA(2/3,-e
*(d*x+c)^3)/d^4/(-e*(d*x+c)^3)^(2/3)-1/3*b^3*(d*x+c)^4*GAMMA(4/3,-e*(d*x+c)
^3)/d^4/(-e*(d*x+c)^3)^(4/3)
```

Rubi [A]

time = 0.10, antiderivative size = 177, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.210$, Rules used = {2258, 2239, 2250, 2240}

$$-\frac{b(c+dx)^2(bc-ad)^2\text{Gamma}\left(\frac{2}{3},-e(c+dx)^3\right)}{d^4\left(-e(c+dx)^3\right)^{2/3}}+\frac{(c+dx)(bc-ad)^3\text{Gamma}\left(\frac{1}{3},-e(c+dx)^3\right)}{3d^4\sqrt[3]{-e(c+dx)^3}}-\frac{b^3(c+dx)^4\text{Gamma}\left(\frac{4}{3},-e(c+dx)^3\right)}{3d^4\left(-e(c+dx)^3\right)^{4/3}}-\frac{b^2(bc-ad)e^{e(c+dx)^3}}{d^4e}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e*(c + d*x)^3)*(a + b*x)^3,x]
```

```
[Out] -((b^2*(b*c - a*d)*E^(e*(c + d*x)^3))/(d^4*e)) + ((b*c - a*d)^3*(c + d*x)*G
amma[1/3, -(e*(c + d*x)^3)])/(3*d^4*(-(e*(c + d*x)^3))^(1/3)) - (b*(b*c - a
*d)^2*(c + d*x)^2*Gamma[2/3, -(e*(c + d*x)^3)])/(d^4*(-(e*(c + d*x)^3))^(2/
3)) - (b^3*(c + d*x)^4*Gamma[4/3, -(e*(c + d*x)^3)])/(3*d^4*(-(e*(c + d*x)^
3))^(4/3))
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
```

```
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int e^{e(c+dx)^3}(a+bx)^3\,dx = \int\left(\frac{(-bc+ad)^3e^{e(c+dx)^3}}{d^3}+\frac{3b(bc-ad)^2e^{e(c+dx)^3}(c+dx)}{d^3}-\frac{3b^2(bc-ad)e^{e(c+dx)^3}(c\right.$$
$$=\frac{b^3\int e^{e(c+dx)^3}(c+dx)^3\,dx}{d^3}-\frac{\left(3b^2(bc-ad)\right)\int e^{e(c+dx)^3}(c+dx)^2\,dx}{d^3}+\frac{\left(3b(bc-ad)^2\right)}{}$$
$$=-\frac{b^2(bc-ad)e^{e(c+dx)^3}}{d^4e}+\frac{(bc-ad)^3(c+dx)\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{3d^4\sqrt[3]{-e(c+dx)^3}}-\frac{b(bc-ad)^2(c+d}{d^4\left(-e(\right.}$$

Mathematica [A]
time = 0.45, size = 167, normalized size = 0.94

$$\frac{-\frac{3b^2(bc-ad)e^{e(c+dx)^3}}{e}+\frac{(bc-ad)^3(c+dx)\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{\sqrt[3]{-e(c+dx)^3}}-\frac{3b(bc-ad)^2(c+dx)^2\Gamma\left(\frac{2}{3},-e(c+dx)^3\right)}{\left(-e(c+dx)^3\right)^{2/3}}+\frac{b^3(c+dx)\Gamma\left(\frac{4}{3},-e(c+dx)^3\right)}{e\sqrt[3]{-e(c+dx)^3}}}{3d^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e*(c + d*x)^3)*(a + b*x)^3,x]
```

```
[Out] ((-3*b^2*(b*c - a*d)*E^(e*(c + d*x)^3))/e + ((b*c - a*d)^3*(c + d*x)*Gamma[
1/3, -(e*(c + d*x)^3)])/(-(e*(c + d*x)^3))^(1/3) - (3*b*(b*c - a*d)^2*(c +
d*x)^2*Gamma[2/3, -(e*(c + d*x)^3)])/(-(e*(c + d*x)^3))^(2/3) + (b^3*(c + d
*x)*Gamma[4/3, -(e*(c + d*x)^3)])/(e*(-(e*(c + d*x)^3))^(1/3)))/(3*d^4)
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int \mathrm{e}^{e(dx+c)^3}(bx+a)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*(d*x+c)^3)*(b*x+a)^3,x)
```

```
[Out] int(exp(e*(d*x+c)^3)*(b*x+a)^3,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)*(b*x+a)^3,x, algorithm="maxima")
```

```
[Out] integrate((b*x + a)^3*e^((d*x + c)^3*e), x)
```

Fricas [A]
time = 0.08, size = 231, normalized size = 1.31

$$\frac{\left(9\,(b^3c^2d-2\,ab^2cd^2+a^2bd^3)(-d^3e)^{\frac{1}{3}}\,e\Gamma\left(\frac{2}{3},-(d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3)e\right)-(-d^3e)^{\frac{2}{3}}\,(b^3+3\,(b^3c^3-3\,ab^2c^2d+3\,a^2bcd^2-a^3d^3)e)\Gamma\left(\frac{1}{3},-(d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3)e\right)+3\,(b^3d^3x-2\,b^3cd^2+3\,ab^2d^3)e^{\left((d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3)e+1\right)}\right)e^{(-2)}}{9\,d^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)*(b*x+a)^3,x, algorithm="fricas")
```

```
[Out] 1/9*(9*(b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3)*(-d^3*e)^(1/3)*e*gamma(2/3,
-(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)*e) - (-d^3*e)^(2/3)*(b^3 + 3*(b^
3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*e)*gamma(1/3, -(d^3*x^3 +
3*c*d^2*x^2 + 3*c^2*d*x + c^3)*e) + 3*(b^3*d^3*x - 2*b^3*c*d^2 + 3*a*b^2*d^
3)*e^((d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)*e + 1))*e^(-2)/d^6
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\left(\int a^3e^{d^3ex^3}e^{3cd^2ex^2}e^{3c^2dex}\,dx+\int b^3x^3e^{d^3ex^3}e^{3cd^2ex^2}e^{3c^2dex}\,dx+\int 3ab^2x^2e^{d^3ex^3}e^{3cd^2ex^2}e^{3c^2dex}\,dx+\int 3a^2bxe^{d^3ex^3}e^{3cd^2ex^2}e^{3c^2dex}\,dx\right)e^{c^3e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)**3)*(b*x+a)**3,x)
```

```
[Out] (Integral(a**3*exp(d**3*e*x**3)*exp(3*c*d**2*e*x**2)*exp(3*c**2*d*e*x), x)
+ Integral(b**3*x**3*exp(d**3*e*x**3)*exp(3*c*d**2*e*x**2)*exp(3*c**2*d*e*x
), x) + Integral(3*a*b**2*x**2*exp(d**3*e*x**3)*exp(3*c*d**2*e*x**2)*exp(3*
c**2*d*e*x), x) + Integral(3*a**2*b*x*exp(d**3*e*x**3)*exp(3*c*d**2*e*x**2)
*exp(3*c**2*d*e*x), x))*exp(c**3*e)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)*(b*x+a)^3,x, algorithm="giac")
```

```
[Out] integrate((b*x + a)^3*e^((d*x + c)^3*e), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int e^{e\,(c+d\,x)^3}\,(a+b\,x)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*(c + d*x)^3)*(a + b*x)^3,x)
[Out] int(exp(e*(c + d*x)^3)*(a + b*x)^3, x)
```

3.392 $\int e^{e(c+dx)^3}(a+bx)^2\,dx$

Optimal. Leaf size=126

$$\frac{b^2e^{e(c+dx)^3}}{3d^3e}-\frac{(bc-ad)^2(c+dx)\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{3d^3\sqrt[3]{-e(c+dx)^3}}+\frac{2b(bc-ad)(c+dx)^2\Gamma\left(\frac{2}{3},-e(c+dx)^3\right)}{3d^3\left(-e(c+dx)^3\right)^{2/3}}$$

```
[Out] 1/3*b^2*exp(e*(d*x+c)^3)/d^3/e-1/3*(-a*d+b*c)^2*(d*x+c)*GAMMA(1/3,-e*(d*x+c
)^3)/d^3/(-e*(d*x+c)^3)^(1/3)+2/3*b*(-a*d+b*c)*(d*x+c)^2*GAMMA(2/3,-e*(d*x+
c)^3)/d^3/(-e*(d*x+c)^3)^(2/3)
```

Rubi [A]
time = 0.07, antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}=0.210$, Rules used = {2258, 2239, 2250, 2240}

$$\frac{2b(c+dx)^2(bc-ad)\text{Gamma}\left(\frac{2}{3},-e(c+dx)^3\right)}{3d^3\left(-e(c+dx)^3\right)^{2/3}}-\frac{(c+dx)(bc-ad)^2\text{Gamma}\left(\frac{1}{3},-e(c+dx)^3\right)}{3d^3\sqrt[3]{-e(c+dx)^3}}+\frac{b^2e^{e(c+dx)^3}}{3d^3e}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e*(c + d*x)^3)*(a + b*x)^2,x]
```

```
[Out] (b^2*E^(e*(c + d*x)^3))/(3*d^3*e) - ((b*c - a*d)^2*(c + d*x)*Gamma[1/3, -(e
*(c + d*x)^3)])/(3*d^3*(-(e*(c + d*x)^3))^(1/3)) + (2*b*(b*c - a*d)*(c + d*
x)^2*Gamma[2/3, -(e*(c + d*x)^3)])/(3*d^3*(-(e*(c + d*x)^3))^(2/3))
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int e^{e(c+dx)^3}(a+bx)^2\,dx = \int \left(\frac{(-bc+ad)^2 e^{e(c+dx)^3}}{d^2} - \frac{2b(bc-ad)e^{e(c+dx)^3}(c+dx)}{d^2} + \frac{b^2 e^{e(c+dx)^3}(c+dx)^2}{d^2}\right) d$$

$$= \frac{b^2\int e^{e(c+dx)^3}(c+dx)^2\,dx}{d^2} - \frac{(2b(bc-ad))\int e^{e(c+dx)^3}(c+dx)\,dx}{d^2} + \frac{(bc-ad)^2\int e^{e(c}}{d^2}$$

$$= \frac{b^2 e^{e(c+dx)^3}}{3d^3e} - \frac{(bc-ad)^2(c+dx)\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{3d^3\sqrt[3]{-e(c+dx)^3}} + \frac{2b(bc-ad)(c+dx)^2\Gamma\left(\frac{2}{3},-e\right.}{3d^3\left(-e(c+dx)^3\right)^{2/}}$$

Mathematica [A]
time = 0.36, size = 117, normalized size = 0.93

$$\frac{\frac{b^2 e^{e(c+dx)^3}}{e} - \frac{(bc-ad)^2(c+dx)\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{\sqrt[3]{-e(c+dx)^3}} + \frac{2b(bc-ad)(c+dx)^2\Gamma\left(\frac{2}{3},-e(c+dx)^3\right)}{\left(-e(c+dx)^3\right)^{2/3}}}{3d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e*(c + d*x)^3)*(a + b*x)^2,x]
```

```
[Out] ((b^2*E^(e*(c + d*x)^3))/e - ((b*c - a*d)^2*(c + d*x)*Gamma[1/3, -(e*(c + d
*x)^3)])/(-(e*(c + d*x)^3))^(1/3) + (2*b*(b*c - a*d)*(c + d*x)^2*Gamma[2/3,
 -(e*(c + d*x)^3)])/(-(e*(c + d*x)^3))^(2/3))/(3*d^3)
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int \mathrm{e}^{e(dx+c)^3}(bx+a)^2\ dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*(d*x+c)^3)*(b*x+a)^2,x)
```

```
[Out] int(exp(e*(d*x+c)^3)*(b*x+a)^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)*(b*x+a)^2,x, algorithm="maxima")
```

```
[Out] integrate((b*x + a)^2*e^((d*x + c)^3*e), x)
```

Fricas [A]
time = 0.09, size = 168, normalized size = 1.33

$$\frac{\left(b^{2} d^{2} e^{\left((d^{3} x^{3}+3 \, c d^{2} x^{2}+3 \, c^{2} d x+c^{3}) e\right)} + (b^{2} c^{2} - 2 \, a b c d + a^{2} d^{2})(-d^{3} e)^{\frac{2}{3}} \Gamma\left(\frac{1}{3}, -(d^{3} x^{3} + 3 \, c d^{2} x^{2} + 3 \, c^{2} d x + c^{3}) e\right) - 2 \, (b^{2} c d - a b d^{2})(-d^{3} e)^{\frac{1}{3}} \Gamma\left(\frac{2}{3}, -(d^{3} x^{3} + 3 \, c d^{2} x^{2} + 3 \, c^{2} d x + c^{3}) e\right)\right) e^{(-1)}}{3 \, d^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)*(b*x+a)^2,x, algorithm="fricas")
```

```
[Out] 1/3*(b^2*d^2*e^((d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)*e) + (b^2*c^2 - 2
*a*b*c*d + a^2*d^2)*(-d^3*e)^(2/3)*gamma(1/3, -(d^3*x^3 + 3*c*d^2*x^2 + 3*c
^2*d*x + c^3)*e) - 2*(b^2*c*d - a*b*d^2)*(-d^3*e)^(1/3)*gamma(2/3, -(d^3*x^
3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)*e))*e^(-1)/d^5
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\left(\int a^{2} e^{d^{3} e x^{3}} e^{3 c d^{2} e x^{2}} e^{3 c^{2} d e x}\, dx + \int b^{2} x^{2} e^{d^{3} e x^{3}} e^{3 c d^{2} e x^{2}} e^{3 c^{2} d e x}\, dx + \int 2 a b x e^{d^{3} e x^{3}} e^{3 c d^{2} e x^{2}} e^{3 c^{2} d e x}\, dx\right) e^{c^{3} e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)**3)*(b*x+a)**2,x)
```

```
[Out] (Integral(a**2*exp(d**3*e*x**3)*exp(3*c*d**2*e*x**2)*exp(3*c**2*d*e*x), x)
+ Integral(b**2*x**2*exp(d**3*e*x**3)*exp(3*c*d**2*e*x**2)*exp(3*c**2*d*e*x
), x) + Integral(2*a*b*x*exp(d**3*e*x**3)*exp(3*c*d**2*e*x**2)*exp(3*c**2*d
*e*x), x))*exp(c**3*e)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)*(b*x+a)^2,x, algorithm="giac")
```

```
[Out] integrate((b*x + a)^2*e^((d*x + c)^3*e), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{e}^{e\,{\left(c+d\,x\right)}^3}\,{\left(a+b\,x\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*(c + d*x)^3)*(a + b*x)^2,x)
```

```
[Out] int(exp(e*(c + d*x)^3)*(a + b*x)^2, x)
```

3.393 $\int e^{e(c+dx)^3}(a+bx)\,dx$

Optimal. Leaf size=92

$$\frac{(bc-ad)(c+dx)\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{3d^2\sqrt[3]{-e(c+dx)^3}}-\frac{b(c+dx)^2\Gamma\left(\frac{2}{3},-e(c+dx)^3\right)}{3d^2\left(-e(c+dx)^3\right)^{2/3}}$$

```
[Out] 1/3*(-a*d+b*c)*(d*x+c)*GAMMA(1/3,-e*(d*x+c)^3)/d^2/(-e*(d*x+c)^3)^(1/3)-1/3
*b*(d*x+c)^2*GAMMA(2/3,-e*(d*x+c)^3)/d^2/(-e*(d*x+c)^3)^(2/3)
```

Rubi [A]
time = 0.04, antiderivative size = 92, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.176$, Rules used = {2258, 2239, 2250}

$$\frac{(c+dx)(bc-ad)\text{Gamma}\left(\frac{1}{3},-e(c+dx)^3\right)}{3d^2\sqrt[3]{-e(c+dx)^3}}-\frac{b(c+dx)^2\text{Gamma}\left(\frac{2}{3},-e(c+dx)^3\right)}{3d^2\left(-e(c+dx)^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e*(c + d*x)^3)*(a + b*x),x]
```

```
[Out] ((b*c - a*d)*(c + d*x)*Gamma[1/3, -(e*(c + d*x)^3)])/(3*d^2*(-(e*(c + d*x)^
3))^(1/3)) - (b*(c + d*x)^2*Gamma[2/3, -(e*(c + d*x)^3)])/(3*d^2*(-(e*(c +
d*x)^3))^(2/3))
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int e^{e(c+dx)^3}(a+bx)\,dx = \int \left(\frac{(-bc+ad)e^{e(c+dx)^3}}{d} + \frac{be^{e(c+dx)^3}(c+dx)}{d}\right)dx$$
$$= \frac{b\int e^{e(c+dx)^3}(c+dx)\,dx}{d} + \frac{(-bc+ad)\int e^{e(c+dx)^3}\,dx}{d}$$
$$= \frac{(bc-ad)(c+dx)\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{3d^2\sqrt[3]{-e(c+dx)^3}} - \frac{b(c+dx)^2\Gamma\left(\frac{2}{3},-e(c+dx)^3\right)}{3d^2\left(-e(c+dx)^3\right)^{2/3}}$$

Mathematica [A]
time = 0.34, size = 86, normalized size = 0.93

$$-\frac{(c+dx)\left(-\left((bc-ad)\sqrt[3]{-e(c+dx)^3}\,\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)\right)+b(c+dx)\Gamma\left(\frac{2}{3},-e(c+dx)^3\right)\right)}{3d^2\left(-e(c+dx)^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e*(c + d*x)^3)*(a + b*x),x]
[Out] -1/3*((c + d*x)*(-((b*c - a*d)*(-(e*(c + d*x)^3))^(1/3)*Gamma[1/3, -(e*(c +
 d*x)^3)]) + b*(c + d*x)*Gamma[2/3, -(e*(c + d*x)^3)]))/(d^2*(-(e*(c + d*x)
^3))^(2/3))
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int e^{e(dx+c)^3}(bx+a)\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*(d*x+c)^3)*(b*x+a),x)
[Out] int(exp(e*(d*x+c)^3)*(b*x+a),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)*(b*x+a),x, algorithm="maxima")
[Out] integrate((b*x + a)*e^((d*x + c)^3*e), x)
```

Fricas [A]
time = 0.09, size = 105, normalized size = 1.14

$$\frac{\left(\left(-d^3e\right)^{\frac{1}{3}}bd\Gamma\left(\frac{2}{3}, -\left(d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3\right)e\right)-\left(-d^3e\right)^{\frac{2}{3}}\left(bc-ad\right)\Gamma\left(\frac{1}{3}, -\left(d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3\right)e\right)\right)e^{(-1)}}{3\,d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)*(b*x+a),x, algorithm="fricas")
[Out] 1/3*((-d^3*e)^(1/3)*b*d*gamma(2/3, -(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^
3)*e) - (-d^3*e)^(2/3)*(b*c - a*d)*gamma(1/3, -(d^3*x^3 + 3*c*d^2*x^2 + 3*c
^2*d*x + c^3)*e))*e^(-1)/d^4
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\left(\int ae^{d^3ex^3}e^{3cd^2ex^2}e^{3c^2dex}\,dx+\int bxe^{d^3ex^3}e^{3cd^2ex^2}e^{3c^2dex}\,dx\right)e^{c^3e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)**3)*(b*x+a),x)
[Out] (Integral(a*exp(d**3*e*x**3)*exp(3*c*d**2*e*x**2)*exp(3*c**2*d*e*x), x) + I
ntegral(b*x*exp(d**3*e*x**3)*exp(3*c*d**2*e*x**2)*exp(3*c**2*d*e*x), x))*ex
p(c**3*e)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)*(b*x+a),x, algorithm="giac")
[Out] integrate((b*x + a)*e^((d*x + c)^3*e), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{e}^{e\,{\left(c+d\,x\right)}^3}\,\left(a+b\,x\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*(c + d*x)^3)*(a + b*x),x)
[Out] int(exp(e*(c + d*x)^3)*(a + b*x), x)
```

3.394 $\int e^{e(c+dx)^3}\,dx$

Optimal. Leaf size=40

$$-\frac{(c+dx)\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{3d\sqrt[3]{-e(c+dx)^3}}$$

```
[Out] -1/3*(d*x+c)*GAMMA(1/3,-e*(d*x+c)^3)/d/(-e*(d*x+c)^3)^(1/3)
```

Rubi [A]
time = 0.00, antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2239}

$$-\frac{(c+dx)\text{Gamma}\left(\frac{1}{3},-e(c+dx)^3\right)}{3d\sqrt[3]{-e(c+dx)^3}}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e*(c + d*x)^3),x]
```

```
[Out] -1/3*((c + d*x)*Gamma[1/3, -(e*(c + d*x)^3)])/(d*(-(e*(c + d*x)^3))^(1/3))
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] && !IntegerQ[2/n]
```

Rubi steps

$$\int e^{e(c+dx)^3}\,dx = -\frac{(c+dx)\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{3d\sqrt[3]{-e(c+dx)^3}}$$

Mathematica [A]
time = 0.05, size = 40, normalized size = 1.00

$$-\frac{(c+dx)\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{3d\sqrt[3]{-e(c+dx)^3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e*(c + d*x)^3),x]
```

```
[Out] -1/3*((c + d*x)*Gamma[1/3, -(e*(c + d*x)^3)])/(d*(-(e*(c + d*x)^3))^(1/3))
```

Maple [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \mathrm{e}^{e(dx+c)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*(d*x+c)^3),x)
[Out] int(exp(e*(d*x+c)^3),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3),x, algorithm="maxima")
[Out] integrate(e^((d*x + c)^3*e), x)
```

Fricas [A]
time = 0.13, size = 49, normalized size = 1.22

$$\frac{\left(-d^3e\right)^{\frac{2}{3}}e^{(-1)}\Gamma\left(\frac{1}{3}, -\left(d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3\right)e\right)}{3\,d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3),x, algorithm="fricas")
[Out] 1/3*(-d^3*e)^(2/3)*e^(-1)*gamma(1/3, -(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x +
c^3)*e)/d^3
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$e^{c^3e}\int e^{d^3ex^3}e^{3cd^2ex^2}e^{3c^2dex}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)**3),x)
[Out] exp(c**3*e)*Integral(exp(d**3*e*x**3)*exp(3*c*d**2*e*x**2)*exp(3*c**2*d*e*x
), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3),x, algorithm="giac")
```

```
[Out] integrate(e^((d*x + c)^3*e), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int e^{e (c+d x)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*(c + d*x)^3),x)
```

```
[Out] int(exp(e*(c + d*x)^3), x)
```

3.395 $\int \frac{e^{e(c+dx)^3}}{a+bx}\,dx$

Optimal. Leaf size=22

$$\mathrm{Int}\left(\frac{e^{e(c+dx)^3}}{a+bx},x\right)$$

```
[Out] Unintegrable(exp(e*(d*x+c)^3)/(b*x+a),x)
```

Rubi [A]
time = 0.01, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{e^{e(c+dx)^3}}{a+bx}\,dx$$

Verification is not applicable to the result.

```
[In] Int[E^(e*(c + d*x)^3)/(a + b*x),x]
[Out] Defer[Int][E^(e*(c + d*x)^3)/(a + b*x), x]
```

Rubi steps

$$\int \frac{e^{e(c+dx)^3}}{a+bx}\,dx = \int \frac{e^{e(c+dx)^3}}{a+bx}\,dx$$

Mathematica [A]
time = 0.55, size = 0, normalized size = 0.00

$$\int \frac{e^{e(c+dx)^3}}{a+bx}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[E^(e*(c + d*x)^3)/(a + b*x),x]
[Out] Integrate[E^(e*(c + d*x)^3)/(a + b*x), x]
```

Maple [A]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{e}^{e(dx+c)^3}}{bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*(d*x+c)^3)/(b*x+a),x)
```

```
[Out] int(exp(e*(d*x+c)^3)/(b*x+a),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)/(b*x+a),x, algorithm="maxima")
```

```
[Out] integrate(e^((d*x + c)^3*e)/(b*x + a), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)/(b*x+a),x, algorithm="fricas")
```

```
[Out] integral(e^((d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)*e)/(b*x + a), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$e^{c^3 e} \int \frac{e^{d^3 e x^3} e^{3 c d^2 e x^2} e^{3 c^2 d e x}}{a + b x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)**3)/(b*x+a),x)
```

```
[Out] exp(c**3*e)*Integral(exp(d**3*e*x**3)*exp(3*c*d**2*e*x**2)*exp(3*c**2*d*e*x
)/(a + b*x), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)/(b*x+a),x, algorithm="giac")
```

```
[Out] integrate(e^((d*x + c)^3*e)/(b*x + a), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{\mathrm{e}^{e\,(c+d\,x)^3}}{a+b\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*(c + d*x)^3)/(a + b*x),x)
[Out] int(exp(e*(c + d*x)^3)/(a + b*x), x)
```

3.396 $\int \frac{e^{e(c+dx)^3}}{(a+bx)^2}\,dx$

Optimal. Leaf size=153

$$-\frac{e^{e(c+dx)^3}}{b(a+bx)}-\frac{d(bc-ad)e(c+dx)\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{b^3\sqrt[3]{-e(c+dx)^3}}-\frac{de(c+dx)^2\Gamma\left(\frac{2}{3},-e(c+dx)^3\right)}{b^2\left(-e(c+dx)^3\right)^{2/3}}+\frac{3d(bc-ad)^2e\text{Int}\left(\frac{e^{e(c+dx)^3}}{a+bx},x\right)}{b^3}$$

```
[Out] -exp(e*(d*x+c)^3)/b/(b*x+a)-d*(-a*d+b*c)*e*(d*x+c)*GAMMA(1/3,-e*(d*x+c)^3)/
b^3/(-e*(d*x+c)^3)^(1/3)-d*e*(d*x+c)^2*GAMMA(2/3,-e*(d*x+c)^3)/b^2/(-e*(d*x
+c)^3)^(2/3)+3*d*(-a*d+b*c)^2*e*Unintegrable(exp(e*(d*x+c)^3)/(b*x+a),x)/b^
3
```

Rubi [A]
time = 0.24, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{e^{e(c+dx)^3}}{(a+bx)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[E^(e*(c + d*x)^3)/(a + b*x)^2,x]
```

```
[Out] -(E^(e*(c + d*x)^3)/(b*(a + b*x))) - (d*(b*c - a*d)*e*(c + d*x)*Gamma[1/3,
-(e*(c + d*x)^3)])/(b^3*(-(e*(c + d*x)^3))^(1/3)) - (d*e*(c + d*x)^2*Gamma[
2/3, -(e*(c + d*x)^3)])/(b^2*(-(e*(c + d*x)^3))^(2/3)) + (3*d*(b*c - a*d)^2
*e*Defer[Int][E^(e*(c + d*x)^3)/(a + b*x), x])/b^3
```

Rubi steps

$$\begin{aligned}
\int \frac{e^{e(c+dx)^3}}{(a+bx)^2}\,dx &= -\frac{e^{e(c+dx)^3}}{b(a+bx)}+\frac{(3de)\int \frac{e^{e(c+dx)^3}(c+dx)^2}{a+bx}\,dx}{b}\\
&= -\frac{e^{e(c+dx)^3}}{b(a+bx)}+\frac{(3de)\int \left(\frac{d(bc-ad)e^{e(c+dx)^3}}{b^2}+\frac{(bc-ad)^2e^{e(c+dx)^3}}{b^2(a+bx)}+\frac{de^{e(c+dx)^3}(c+dx)}{b}\right)dx}{b}\\
&= -\frac{e^{e(c+dx)^3}}{b(a+bx)}+\frac{(3d^2e)\int e^{e(c+dx)^3}(c+dx)\,dx}{b^2}+\frac{(3d^2(bc-ad)e)\int e^{e(c+dx)^3}\,dx}{b^3}+\frac{(3d(bc-a\ldots}{}\\
&= -\frac{e^{e(c+dx)^3}}{b(a+bx)}-\frac{d(bc-ad)e(c+dx)\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{b^3\sqrt[3]{-e(c+dx)^3}}-\frac{de(c+dx)^2\Gamma\left(\frac{2}{3},-e(c+dx)^3\right)}{b^2\left(-e(c+dx)^3\right)^{2/3}}+\ldots
\end{aligned}$$

Mathematica [A]
time = 2.48, size = 0, normalized size = 0.00

$$\int \frac{e^{e(c+dx)^3}}{(a+bx)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[E^(e*(c + d*x)^3)/(a + b*x)^2,x]
[Out] Integrate[E^(e*(c + d*x)^3)/(a + b*x)^2, x]
```

Maple [A]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{e^{e(dx+c)^3}}{(bx+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*(d*x+c)^3)/(b*x+a)^2,x)
[Out] int(exp(e*(d*x+c)^3)/(b*x+a)^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)/(b*x+a)^2,x, algorithm="maxima")
[Out] integrate(e^((d*x + c)^3*e)/(b*x + a)^2, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)/(b*x+a)^2,x, algorithm="fricas")
[Out] integral(e^((d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)*e)/(b^2*x^2 + 2*a*b*x
 + a^2), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)**3)/(b*x+a)**2,x)
```

```
[Out] Timed out
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)/(b*x+a)^2,x, algorithm="giac")
```

```
[Out] undef
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{e}^{e\,{\left(c+d\,x\right)}^3}}{{\left(a+b\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*(c + d*x)^3)/(a + b*x)^2,x)
```

```
[Out] int(exp(e*(c + d*x)^3)/(a + b*x)^2, x)
```

3.397 $\int \frac{F^{a+\frac{b}{c+dx}}}{e+fx}\,dx$

Optimal. Leaf size=71

$$-\frac{F^a \mathrm{Ei}\left(\frac{b\log(F)}{c+dx}\right)}{f}+\frac{F^{a-\frac{bf}{de-cf}}\mathrm{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)}{f}$$

```
[Out] -F^a*Ei(b*ln(F)/(d*x+c))/f+F^(a-b*f/(-c*f+d*e))*Ei(b*d*(f*x+e)*ln(F)/(-c*f+
d*e)/(d*x+c))/f
```

Rubi [A]
time = 0.27, antiderivative size = 71, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.190$, Rules used = {2254, 2241, 2260, 2209}

$$\frac{F^{a-\frac{bf}{de-cf}}\mathrm{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)}{f}-\frac{F^a \mathrm{Ei}\left(\frac{b\log(F)}{c+dx}\right)}{f}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))/(e + f*x),x]
```

```
[Out] -((F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)])/f) + (F^(a - (b*f)/(d*e - c*f))
*ExpIntegralEi[(b*d*(e + f*x)*Log[F])/((d*e - c*f)*(c + d*x))])/f
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2254

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/((e_.) + (f_.)*(x_)), x_Symbo
l] :> Dist[d/f, Int[F^(a + b/(c + d*x))/(c + d*x), x], x] - Dist[(d*e - c*f
)/f, Int[F^(a + b/(c + d*x))/((c + d*x)*(e + f*x)), x], x] /; FreeQ[{F, a,
b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
```

Rule 2260

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/(((e_.) + (f_.)*(x_))*((g_.)
+ (h_.)*(x_))), x_Symbol] :> Dist[-d/(f*(d*g - c*h)), Subst[Int[F^(a - b*(h
/(d*g - c*h)) + d*b*(x/(d*g - c*h)))/x, x], x, (g + h*x)/(c + d*x)], x] /;
FreeQ[{F, a, b, c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{F^{a+\frac{b}{c+dx}}}{e+fx}\,dx &= \frac{d\int \frac{F^{a+\frac{b}{c+dx}}}{c+dx}\,dx}{f} - \frac{(de-cf)\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)(e+fx)}\,dx}{f}\\ &= -\frac{F^a\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)}{f} + \frac{\text{Subst}\left(\int \frac{F^{a-\frac{bf}{de-cf}+\frac{bdx}{de-cf}}}{x}\,dx, x, \frac{e+fx}{c+dx}\right)}{f}\\ &= -\frac{F^a\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)}{f} + \frac{F^{a-\frac{bf}{de-cf}}\text{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)}{f}\end{aligned}$$

Mathematica [A]
time = 0.09, size = 66, normalized size = 0.93

$$\frac{F^a\left(-\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)+F^{\frac{bf}{-de+cf}}\text{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)\right)}{f}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))/(e + f*x),x]
[Out] (F^a*(-ExpIntegralEi[(b*Log[F])/(c + d*x)] + F^((b*f)/(-(d*e) + c*f))*ExpIn
tegralEi[(b*d*(e + f*x)*Log[F])/((d*e - c*f)*(c + d*x))]))/f
```

Maple [A]
time = 0.14, size = 106, normalized size = 1.49

method	result	size
risch	$-\frac{F^{\frac{acf-ade+bf}{cf-ed}}\,\text{expIntegral}\left(1,-\frac{b\ln(F)}{dx+c}-\ln(F)a-\frac{-\ln(F)acf+\ln(F)ade-\ln(F)bf}{cf-ed}\right)}{f}+\frac{F^a\,\text{expIntegral}\left(1,-\frac{b\ln(F)}{dx+c}\right)}{f}$	106

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c))/(f*x+e),x,method=_RETURNVERBOSE)
[Out] -1/f*F^((a*c*f-a*d*e+b*f)/(c*f-d*e))*Ei(1,-b*ln(F)/(d*x+c)-ln(F)*a-(-ln(F)*
a*c*f+ln(F)*a*d*e-ln(F)*b*f)/(c*f-d*e))+1/f*F^a*Ei(1,-b*ln(F)/(d*x+c))
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(f*x+e),x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(f*x + e), x)
```

Fricas [**A**]
time = 0.38, size = 96, normalized size = 1.35

$$-\frac{F^{a}\mathrm{Ei}\left(\frac{b\log(F)}{dx+c}\right)-\frac{\mathrm{Ei}\left(-\frac{(bdfx+bde)\log(F)}{cdfx+c^{2}f-\left(d^{2}x+cd\right)e}\right)}{F^{\frac{ade-(ac+b)f}{cf-de}}}}{f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(f*x+e),x, algorithm="fricas")
```

```
[Out] -(F^a*Ei(b*log(F)/(d*x + c)) - Ei(-(b*d*f*x + b*d*e)*log(F)/(c*d*f*x + c^2*
f - (d^2*x + c*d)*e))/F^((a*d*e - (a*c + b)*f)/(c*f - d*e)))/f
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))/(f*x+e),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(f*x+e),x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(f*x + e), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{F^{a+\frac{b}{c+d\,x}}}{e+f\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))/(e + f*x),x)
[Out] int(F^(a + b/(c + d*x))/(e + f*x), x)
```

3.398 $\int \frac{F^{a+\frac{b}{c+dx}}}{(e+fx)^2} dx$

Optimal. Leaf size=116

$$\frac{dF^{a+\frac{b}{c+dx}}}{f(de-cf)}-\frac{F^{a+\frac{b}{c+dx}}}{f(e+fx)}-\frac{bdF^{a-\frac{bf}{de-cf}}\operatorname{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)\log(F)}{(de-cf)^2}$$

```
[Out] d*F^(a+b/(d*x+c))/f/(-c*f+d*e)-F^(a+b/(d*x+c))/f/(f*x+e)-b*d*F^(a-b*f/(-c*f
+d*e))*Ei(b*d*(f*x+e)*ln(F)/(-c*f+d*e)/(d*x+c))*ln(F)/(-c*f+d*e)^2
```

Rubi [A]
time = 0.67, antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {2255, 6874, 2240, 2241, 2254, 2260, 2209}

$$-\frac{bd\log(F)F^{a-\frac{bf}{de-cf}}\operatorname{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)}{(de-cf)^2}+\frac{dF^{a+\frac{b}{c+dx}}}{f(de-cf)}-\frac{F^{a+\frac{b}{c+dx}}}{f(e+fx)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))/(e + f*x)^2,x]
```

```
[Out] (d*F^(a + b/(c + d*x)))/(f*(d*e - c*f)) - F^(a + b/(c + d*x))/(f*(e + f*x))
 - (b*d*F^(a - (b*f)/(d*e - c*f))*ExpIntegralEi[(b*d*(e + f*x)*Log[F])/((d*
e - c*f)*(c + d*x))]*Log[F])/(d*e - c*f)^2
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2254

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/((e_.) + (f_.)*(x_)), x_Symbo
l] :> Dist[d/f, Int[F^(a + b/(c + d*x))/(c + d*x), x], x] - Dist[(d*e - c*f
)/f, Int[F^(a + b/(c + d*x))/((c + d*x)*(e + f*x)), x], x] /; FreeQ[{F, a,
b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
```

Rule 2255

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))*((e_.) + (f_.)*(x_))^(m_), x_
Symbol] :> Simp[(e + f*x)^(m + 1)*(F^(a + b/(c + d*x))/(f*(m + 1))), x] + D
ist[b*d*(Log[F]/(f*(m + 1))), Int[(e + f*x)^(m + 1)*(F^(a + b/(c + d*x))/(c
 + d*x)^2), x], x] /; FreeQ[{F, a, b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
&& ILtQ[m, -1]
```

Rule 2260

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/(((e_.) + (f_.)*(x_))*((g_.)
+ (h_.)*(x_))), x_Symbol] :> Dist[-d/(f*(d*g - c*h)), Subst[Int[F^(a - b*(h
/(d*g - c*h)) + d*b*(x/(d*g - c*h)))/x, x], x, (g + h*x)/(c + d*x)], x] /;
FreeQ[{F, a, b, c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{c+dx}}}{(e+fx)^2}\,dx = -\frac{F^{a+\frac{b}{c+dx}}}{f(e+fx)} - \frac{(bd\log(F))\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^2(e+fx)}\,dx}{f}$$

$$= -\frac{F^{a+\frac{b}{c+dx}}}{f(e+fx)} - \frac{(bd\log(F))\int \left(\frac{dF^{a+\frac{b}{c+dx}}}{(de-cf)(c+dx)^2} - \frac{dfF^{a+\frac{b}{c+dx}}}{(de-cf)^2(c+dx)} + \frac{f^2F^{a+\frac{b}{c+dx}}}{(de-cf)^2(e+fx)}\right)dx}{f}$$

$$= -\frac{F^{a+\frac{b}{c+dx}}}{f(e+fx)} + \frac{(bd^2\log(F))\int \frac{F^{a+\frac{b}{c+dx}}}{c+dx}\,dx}{(de-cf)^2} - \frac{(bdf\log(F))\int \frac{F^{a+\frac{b}{c+dx}}}{e+fx}\,dx}{(de-cf)^2} - \frac{(bd^2\log(F))\int \frac{F^{a}}{(c}}{f(de-cf}$$

$$= \frac{dF^{a+\frac{b}{c+dx}}}{f(de-cf)} - \frac{F^{a+\frac{b}{c+dx}}}{f(e+fx)} - \frac{bdF^a\operatorname{Ei}\left(\frac{b\log(F)}{c+dx}\right)\log(F)}{(de-cf)^2} - \frac{(bd^2\log(F))\int \frac{F^{a+\frac{b}{c+dx}}}{c+dx}\,dx}{(de-cf)^2} + \frac{(bd\log}{}$$

$$= \frac{dF^{a+\frac{b}{c+dx}}}{f(de-cf)} - \frac{F^{a+\frac{b}{c+dx}}}{f(e+fx)} - \frac{(bd\log(F))\text{Subst}\left(\int \frac{F^{a-\frac{bf}{de-cf}+\frac{bdx}{de-cf}}}{x}\,dx, x, \frac{e+fx}{c+dx}\right)}{(de-cf)^2}$$

$$= \frac{dF^{a+\frac{b}{c+dx}}}{f(de-cf)} - \frac{F^{a+\frac{b}{c+dx}}}{f(e+fx)} - \frac{bdF^{a-\frac{bf}{de-cf}}\operatorname{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)\log(F)}{(de-cf)^2}$$

Mathematica [A]
time = 0.19, size = 116, normalized size = 1.00

$$\frac{dF^{a+\frac{b}{c+dx}}}{f(de-cf)} - \frac{F^{a+\frac{b}{c+dx}}}{f(e+fx)} - \frac{bdF^{a+\frac{bf}{-de+cf}}\operatorname{Ei}\left(-\frac{bf\log(F)}{-de+cf}+\frac{b\log(F)}{c+dx}\right)\log(F)}{(de-cf)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))/(e + f*x)^2,x]
[Out] (d*F^(a + b/(c + d*x)))/(f*(d*e - c*f)) - F^(a + b/(c + d*x))/(f*(e + f*x))
 - (b*d*F^(a + (b*f)/(-(d*e) + c*f))*ExpIntegralEi[-((b*f*Log[F])/(-(d*e) +
 c*f)) + (b*Log[F])/(c + d*x)]*Log[F])/(d*e - c*f)^2
```

Maple [A]
time = 0.11, size = 191, normalized size = 1.65

method	result
risch	$\frac{d\ln(F)bF^{a}F^{\frac{b}{dx+c}}}{(cf-ed)^2\left(\frac{b\ln(F)}{dx+c}+\ln(F)a-\frac{\ln(F)acf}{cf-ed}+\frac{\ln(F)ade}{cf-ed}-\frac{\ln(F)bf}{cf-ed}\right)} + \frac{d\ln(F)bF^{\frac{acf-ade+bf}{cf-ed}}\text{expIntegral}\left(1,-\frac{b\ln(F)}{dx+c}-\ln(F)a-\frac{-\ln(F)acf+\ln}{cf}\right.}{(cf-ed)^2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c))/(f*x+e)^2,x,method=_RETURNVERBOSE)
```

```
[Out] d*ln(F)*b/(c*f-d*e)^2*F^a*F^(b/(d*x+c))/(b*ln(F)/(d*x+c)+ln(F)*a-1/(c*f-d*e
)*ln(F)*a*c*f+1/(c*f-d*e)*ln(F)*a*d*e-1/(c*f-d*e)*ln(F)*b*f)+d*ln(F)*b/(c*f
-d*e)^2*F^((a*c*f-a*d*e+b*f)/(c*f-d*e))*Ei(1,-b*ln(F)/(d*x+c)-ln(F)*a-(-ln(
F)*a*c*f+ln(F)*a*d*e-ln(F)*b*f)/(c*f-d*e))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(f*x+e)^2,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(f*x + e)^2, x)
```

Fricas [A]
time = 0.36, size = 186, normalized size = 1.60

$$-\frac{(cdfx+c^2f-(d^2x+cd)e)F^{\frac{adx+ac+b}{dx+c}}+\frac{(bdfx+bde)\operatorname{Ei}\left(-\frac{(bdfx+bde)\log(F)}{cdfx+c^2f-\left(d^2x+cd\right)e}\right)\log(F)}{F^{\frac{ade-(ac+b)f}{cf-de}}}}{c^2f^3x+d^2e^3+(d^2fx-2\,cdf)e^2-(2\,cdf^2x-c^2f^2)e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(f*x+e)^2,x, algorithm="fricas")
```

```
[Out] -((c*d*f*x + c^2*f - (d^2*x + c*d)*e)*F^((a*d*x + a*c + b)/(d*x + c)) + (b*
d*f*x + b*d*e)*Ei(-(b*d*f*x + b*d*e)*log(F)/(c*d*f*x + c^2*f - (d^2*x + c*d
)*e))*log(F)/F^((a*d*e - (a*c + b)*f)/(c*f - d*e)))/(c^2*f^3*x + d^2*e^3 +
(d^2*f*x - 2*c*d*f)*e^2 - (2*c*d*f^2*x - c^2*f^2)*e)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))/(f*x+e)**2,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(f*x+e)^2,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(f*x + e)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{F^{a+\frac{b}{c+d\,x}}}{{\left(e+f\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))/(e + f*x)^2,x)
```

```
[Out] int(F^(a + b/(c + d*x))/(e + f*x)^2, x)
```

3.399 $\int \frac{F^{a+\frac{b}{c+dx}}}{(e+fx)^3}\,dx$

Optimal. Leaf size=267

$$\frac{d^2F^{a+\frac{b}{c+dx}}}{2f(de-cf)^2}-\frac{F^{a+\frac{b}{c+dx}}}{2f(e+fx)^2}-\frac{bd^2F^{a+\frac{b}{c+dx}}\log(F)}{2(de-cf)^3}+\frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{2(de-cf)^2(e+fx)}-\frac{bd^2F^{a-\frac{bf}{de-cf}}\operatorname{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)\log(}{(de-cf)^3}$$

```
[Out] 1/2*d^2*F^(a+b/(d*x+c))/f/(-c*f+d*e)^2-1/2*F^(a+b/(d*x+c))/f/(f*x+e)^2-1/2*
b*d^2*F^(a+b/(d*x+c))*ln(F)/(-c*f+d*e)^3+1/2*b*d*F^(a+b/(d*x+c))*ln(F)/(-c*
f+d*e)^2/(f*x+e)-b*d^2*F^(a-b*f/(-c*f+d*e))*Ei(b*d*(f*x+e)*ln(F)/(-c*f+d*e)
/(d*x+c))*ln(F)/(-c*f+d*e)^3+1/2*b^2*d^2*f*F^(a-b*f/(-c*f+d*e))*Ei(b*d*(f*x
+e)*ln(F)/(-c*f+d*e)/(d*x+c))*ln(F)^2/(-c*f+d*e)^4
```

Rubi [A]
time = 1.27, antiderivative size = 267, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {2255, 6874, 2240, 2241, 2254, 2260, 2209}

$$\frac{b^2d^2f\log^2(F)F^{a-\frac{bf}{de-cf}}\operatorname{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)}{2(de-cf)^4}-\frac{bd^2\log(F)F^{a-\frac{bf}{de-cf}}\operatorname{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)}{(de-cf)^3}+\frac{d^2F^{a+\frac{b}{c+dx}}}{2f(de-cf)^2}-\frac{bd^2\log(F)F^{a+\frac{b}{c+dx}}}{2(de-cf)^3}-\frac{F^{a+\frac{b}{c+dx}}}{2f(e+fx)^2}+\frac{bd\log(F)F^{a+\frac{b}{c+dx}}}{2(e+fx)(de-cf)^2}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))/(e + f*x)^3,x]
```

```
[Out] (d^2*F^(a + b/(c + d*x)))/(2*f*(d*e - c*f)^2) - F^(a + b/(c + d*x))/(2*f*(e
 + f*x)^2) - (b*d^2*F^(a + b/(c + d*x))*Log[F])/(2*(d*e - c*f)^3) + (b*d*F^
(a + b/(c + d*x))*Log[F])/(2*(d*e - c*f)^2*(e + f*x)) - (b*d^2*F^(a - (b*f)
/(d*e - c*f))*ExpIntegralEi[(b*d*(e + f*x)*Log[F])/((d*e - c*f)*(c + d*x))]
*Log[F])/(d*e - c*f)^3 + (b^2*d^2*f*F^(a - (b*f)/(d*e - c*f))*ExpIntegralEi
[(b*d*(e + f*x)*Log[F])/((d*e - c*f)*(c + d*x))]*Log[F]^2)/(2*(d*e - c*f)^4
)
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2254

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/((e_.) + (f_.)*(x_)), x_Symbo
l] :> Dist[d/f, Int[F^(a + b/(c + d*x))/(c + d*x), x], x] - Dist[(d*e - c*f
)/f, Int[F^(a + b/(c + d*x))/((c + d*x)*(e + f*x)), x], x] /; FreeQ[{F, a,
b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
```

Rule 2255

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))*((e_.) + (f_.)*(x_))^(m_), x_
Symbol] :> Simp[(e + f*x)^(m + 1)*(F^(a + b/(c + d*x))/(f*(m + 1))), x] + D
ist[b*d*(Log[F]/(f*(m + 1))), Int[(e + f*x)^(m + 1)*(F^(a + b/(c + d*x))/(c
 + d*x)^2), x], x] /; FreeQ[{F, a, b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
&& ILtQ[m, -1]
```

Rule 2260

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/(((e_.) + (f_.)*(x_))*((g_.)
+ (h_.)*(x_))), x_Symbol] :> Dist[-d/(f*(d*g - c*h)), Subst[Int[F^(a - b*(h
/(d*g - c*h)) + d*b*(x/(d*g - c*h)))/x, x], x, (g + h*x)/(c + d*x)], x] /;
FreeQ[{F, a, b, c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{c+dx}}}{(e+fx)^3}\,dx = -\frac{F^{a+\frac{b}{c+dx}}}{2f(e+fx)^2} - \frac{(bd\log(F))\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^2(e+fx)^2}\,dx}{2f}$$

$$= -\frac{F^{a+\frac{b}{c+dx}}}{2f(e+fx)^2} - \frac{(bd\log(F))\int \left(\frac{d^2F^{a+\frac{b}{c+dx}}}{(de-cf)^2(c+dx)^2} - \frac{2d^2fF^{a+\frac{b}{c+dx}}}{(de-cf)^3(c+dx)} + \frac{f^2F^{a+\frac{b}{c+dx}}}{(de-cf)^2(e+fx)^2} + \frac{2df^2F^{a-}}{(de-cf)^3}\right.}{2f}$$

$$= -\frac{F^{a+\frac{b}{c+dx}}}{2f(e+fx)^2} + \frac{(bd^3\log(F))\int \frac{F^{a+\frac{b}{c+dx}}}{c+dx}\,dx}{(de-cf)^3} - \frac{(bd^2f\log(F))\int \frac{F^{a+\frac{b}{c+dx}}}{e+fx}\,dx}{(de-cf)^3} - \frac{(bd^3\log(F))}{2f(de}$$

$$= \frac{d^2F^{a+\frac{b}{c+dx}}}{2f(de-cf)^2} - \frac{F^{a+\frac{b}{c+dx}}}{2f(e+fx)^2} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{2(de-cf)^2(e+fx)} - \frac{bd^2F^a\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)\log(F)}{(de-cf)^3} - \frac{(bd^3}{}$$

$$= \frac{d^2F^{a+\frac{b}{c+dx}}}{2f(de-cf)^2} - \frac{F^{a+\frac{b}{c+dx}}}{2f(e+fx)^2} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{2(de-cf)^2(e+fx)} - \frac{(bd^2\log(F))\,\text{Subst}\left(\int \frac{F^{a-\frac{bf}{de-cf}+d}}{x}\right.}{(de-cf)^3}$$

$$= \frac{d^2F^{a+\frac{b}{c+dx}}}{2f(de-cf)^2} - \frac{F^{a+\frac{b}{c+dx}}}{2f(e+fx)^2} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{2(de-cf)^2(e+fx)} - \frac{bd^2F^{a-\frac{bf}{de-cf}}\text{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)\log}{(de-cf)^3}$$

$$= \frac{d^2F^{a+\frac{b}{c+dx}}}{2f(de-cf)^2} - \frac{F^{a+\frac{b}{c+dx}}}{2f(e+fx)^2} - \frac{bd^2F^{a+\frac{b}{c+dx}}\log(F)}{2(de-cf)^3} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{2(de-cf)^2(e+fx)} - \frac{bd^2F^{a-\frac{bf}{de-c}}}{}$$

$$= \frac{d^2F^{a+\frac{b}{c+dx}}}{2f(de-cf)^2} - \frac{F^{a+\frac{b}{c+dx}}}{2f(e+fx)^2} - \frac{bd^2F^{a+\frac{b}{c+dx}}\log(F)}{2(de-cf)^3} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{2(de-cf)^2(e+fx)} - \frac{bd^2F^{a-\frac{bf}{de-c}}}{}$$

$$= \frac{d^2F^{a+\frac{b}{c+dx}}}{2f(de-cf)^2} - \frac{F^{a+\frac{b}{c+dx}}}{2f(e+fx)^2} - \frac{bd^2F^{a+\frac{b}{c+dx}}\log(F)}{2(de-cf)^3} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{2(de-cf)^2(e+fx)} - \frac{bd^2F^{a-\frac{bf}{de-c}}}{}$$

Mathematica [F]
time = 0.41, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{c+dx}}}{(e+fx)^3}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[F^(a + b/(c + d*x))/(e + f*x)^3,x]
```

```
[Out] Integrate[F^(a + b/(c + d*x))/(e + f*x)^3, x]
```

Maple [A]
time = 0.13, size = 506, normalized size = 1.90

method	result
risch	$-\frac{b\,d^2\ln(F)F^aF^{\frac{b}{dx+c}}}{(cf-ed)^3\left(\frac{b\ln(F)}{dx+c}+\ln(F)a-\frac{\ln(F)acf}{cf-ed}+\frac{\ln(F)ade}{cf-ed}-\frac{\ln(F)bf}{cf-ed}\right)}-\frac{b\,d^2\ln(F)F^{\frac{acf-ade+bf}{cf-ed}}\operatorname{expIntegral}\left(1,-\frac{b\ln(F)}{dx+c}-\ln(F)a-\frac{-\ln(F)ac}{}\right.}{(cf-ed)^3}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c))/(f*x+e)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -b*d^2*ln(F)/(c*f-d*e)^3*F^a*F^(b/(d*x+c))/(b*ln(F)/(d*x+c)+ln(F)*a-1/(c*f-
d*e)*ln(F)*a*c*f+1/(c*f-d*e)*ln(F)*a*d*e-1/(c*f-d*e)*ln(F)*b*f)-b*d^2*ln(F)
/(c*f-d*e)^3*F^((a*c*f-a*d*e+b*f)/(c*f-d*e))*Ei(1,-b*ln(F)/(d*x+c)-ln(F)*a-
(-ln(F)*a*c*f+ln(F)*a*d*e-ln(F)*b*f)/(c*f-d*e))-1/2*b^2*d^2*ln(F)^2*f/(c*f-
d*e)^4*F^a*F^(b/(d*x+c))/(b*ln(F)/(d*x+c)+ln(F)*a-1/(c*f-d*e)*ln(F)*a*c*f+1
/(c*f-d*e)*ln(F)*a*d*e-1/(c*f-d*e)*ln(F)*b*f)^2-1/2*b^2*d^2*ln(F)^2*f/(c*f-
d*e)^4*F^a*F^(b/(d*x+c))/(b*ln(F)/(d*x+c)+ln(F)*a-1/(c*f-d*e)*ln(F)*a*c*f+1
/(c*f-d*e)*ln(F)*a*d*e-1/(c*f-d*e)*ln(F)*b*f)-1/2*b^2*d^2*ln(F)^2*f/(c*f-d*
e)^4*F^((a*c*f-a*d*e+b*f)/(c*f-d*e))*Ei(1,-b*ln(F)/(d*x+c)-ln(F)*a-(-ln(F)*
a*c*f+ln(F)*a*d*e-ln(F)*b*f)/(c*f-d*e))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(f*x+e)^3,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(f*x + e)^3, x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 556 vs. 2(269) = 538.
time = 0.38, size = 556, normalized size = 2.08

$$\frac{(c^2d^2f^3x^2-c^4f^3+2(d^4x+cd^3)e^3+(d^4fx^2-4cd^3fx-5c^2d^2f)e^2-2(cd^3f^2x^2-c^2d^2f^2x-2c^3df^2)e+(bcd^2f^3x^2+bc^2df^3x-(bd^3fx+bcd^2f)e^2-(bd^3f^2x^2-bc^2df^2)e)\log(F))F^{\frac{adx+ac+b}{dx+c}}+\frac{\left((b^2d^2f^3x^2+2b^2d^2f^2xe+b^2d^2fe^2)\log(F)^2+2(bcd^2f^3x^2-bd^3e^3-(2bd^3fx-bcd^2f)e^2-(bd^3f^2x^2-2bcd^2f^2x)e)\log(F)\right)\mathrm{Ei}\left(-\frac{(bdfx+bde)\log(F)}{cdfx+c^2f-(d^2x+cd)e}\right)}{F^{\frac{ade-(ac+b)f}{cf-de}}}}{2(c^4f^6x^2+d^4e^6+2(d^4fx-2cd^3f)e^5+(d^4f^2x^2-8cd^3f^2x+6c^2d^2f^2)e^4-4(cd^3f^3x^2-3c^2d^2f^3x+c^3df^3)e^3+(6c^2d^2f^4x^2-8c^3df^4x+c^4f^4)e^2-2(2c^3df^5x^2-c^4f^5x)e)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(f*x+e)^3,x, algorithm="fricas")
```

```
[Out] 1/2*((c^2*d^2*f^3*x^2 - c^4*f^3 + 2*(d^4*x + c*d^3)*e^3 + (d^4*f*x^2 - 4*c*
d^3*f*x - 5*c^2*d^2*f)*e^2 - 2*(c*d^3*f^2*x^2 - c^2*d^2*f^2*x - 2*c^3*d*f^2
)*e + (b*c*d^2*f^3*x^2 + b*c^2*d*f^3*x - (b*d^3*f*x + b*c*d^2*f)*e^2 - (b*d
^3*f^2*x^2 - b*c^2*d*f^2)*e)*log(F))*F^((a*d*x + a*c + b)/(d*x + c)) + ((b^
2*d^2*f^3*x^2 + 2*b^2*d^2*f^2*x*e + b^2*d^2*f*e^2)*log(F)^2 + 2*(b*c*d^2*f^
3*x^2 - b*d^3*e^3 - (2*b*d^3*f*x - b*c*d^2*f)*e^2 - (b*d^3*f^2*x^2 - 2*b*c*
```

```
d^2*f^2*x)*e)*log(F))*Ei(-(b*d*f*x + b*d*e)*log(F)/(c*d*f*x + c^2*f - (d^2*
x + c*d)*e))/F^((a*d*e - (a*c + b)*f)/(c*f - d*e)))/(c^4*f^6*x^2 + d^4*e^6
+ 2*(d^4*f*x - 2*c*d^3*f)*e^5 + (d^4*f^2*x^2 - 8*c*d^3*f^2*x + 6*c^2*d^2*f^
2)*e^4 - 4*(c*d^3*f^3*x^2 - 3*c^2*d^2*f^3*x + c^3*d*f^3)*e^3 + (6*c^2*d^2*f
^4*x^2 - 8*c^3*d*f^4*x + c^4*f^4)*e^2 - 2*(2*c^3*d*f^5*x^2 - c^4*f^5*x)*e)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))/(f*x+e)**3,x)
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(f*x+e)^3,x, algorithm="giac")
[Out] integrate(F^(a + b/(d*x + c))/(f*x + e)^3, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{F^{a+\frac{b}{c+d\,x}}}{{\left(e+f\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))/(e + f*x)^3,x)
[Out] int(F^(a + b/(c + d*x))/(e + f*x)^3, x)
```

3.400 $\int \frac{F^{a+\frac{b}{c+dx}}}{(e+fx)^4} dx$

Optimal. Leaf size=460

$$\frac{d^3F^{a+\frac{b}{c+dx}}}{3f(de-cf)^3}-\frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3}-\frac{5bd^3F^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^4}+\frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^2(e+fx)^2}+\frac{2bd^2F^{a+\frac{b}{c+dx}}\log(F)}{3(de-cf)^3(e+fx)}-\frac{bd^3F^{a-\frac{bf}{de-c}}}{}$$

```
[Out] 1/3*d^3*F^(a+b/(d*x+c))/f/(-c*f+d*e)^3-1/3*F^(a+b/(d*x+c))/f/(f*x+e)^3-5/6*
b*d^3*F^(a+b/(d*x+c))*ln(F)/(-c*f+d*e)^4+1/6*b*d*F^(a+b/(d*x+c))*ln(F)/(-c*
f+d*e)^2/(f*x+e)^2+2/3*b*d^2*F^(a+b/(d*x+c))*ln(F)/(-c*f+d*e)^3/(f*x+e)-b*d
^3*F^(a-b*f/(-c*f+d*e))*Ei(b*d*(f*x+e)*ln(F)/(-c*f+d*e)/(d*x+c))*ln(F)/(-c*
f+d*e)^4+1/6*b^2*d^3*f*F^(a+b/(d*x+c))*ln(F)^2/(-c*f+d*e)^5-1/6*b^2*d^2*f*F
^(a+b/(d*x+c))*ln(F)^2/(-c*f+d*e)^4/(f*x+e)+b^2*d^3*f*F^(a-b*f/(-c*f+d*e))*
Ei(b*d*(f*x+e)*ln(F)/(-c*f+d*e)/(d*x+c))*ln(F)^2/(-c*f+d*e)^5-1/6*b^3*d^3*f
^2*F^(a-b*f/(-c*f+d*e))*Ei(b*d*(f*x+e)*ln(F)/(-c*f+d*e)/(d*x+c))*ln(F)^3/(-
c*f+d*e)^6
```

Rubi [A]
time = 2.54, antiderivative size = 460, normalized size of antiderivative = 1.00, number of steps used = 36, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {2255, 6874, 2240, 2241, 2254, 2260, 2209}

$$-\frac{b^3d^3f^2\log^3(F)F^{a-\frac{bf}{de-cf}}\text{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)}{6(de-cf)^6}+\frac{b^2d^3f\log^2(F)F^{a-\frac{bf}{de-cf}}\text{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)}{(de-cf)^5}+\frac{b^2d^3f\log^2(F)F^{a+\frac{b}{c+dx}}}{6(de-cf)^5}-\frac{b^2d^2f\log^2(F)F^{a+\frac{b}{c+dx}}}{6(e+fx)(de-cf)^4}-\frac{bd^3\log(F)F^{a-\frac{bf}{de-cf}}\text{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)}{(de-cf)^4}+\frac{d^3F^{a+\frac{b}{c+dx}}}{3f(de-cf)^3}-\frac{5bd^3\log(F)F^{a+\frac{b}{c+dx}}}{6(de-cf)^4}+\frac{2bd^2\log(F)F^{a+\frac{b}{c+dx}}}{3(e+fx)(de-cf)^3}-\frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3}+\frac{bd\log(F)F^{a+\frac{b}{c+dx}}}{6(e+fx)^2(de-cf)^2}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))/(e + f*x)^4,x]
```

```
[Out] (d^3*F^(a + b/(c + d*x)))/(3*f*(d*e - c*f)^3) - F^(a + b/(c + d*x))/(3*f*(e
 + f*x)^3) - (5*b*d^3*F^(a + b/(c + d*x))*Log[F])/(6*(d*e - c*f)^4) + (b*d*
F^(a + b/(c + d*x))*Log[F])/(6*(d*e - c*f)^2*(e + f*x)^2) + (2*b*d^2*F^(a +
 b/(c + d*x))*Log[F])/(3*(d*e - c*f)^3*(e + f*x)) - (b*d^3*F^(a - (b*f)/(d*
e - c*f))*ExpIntegralEi[(b*d*(e + f*x)*Log[F])/((d*e - c*f)*(c + d*x))]*Log
[F])/(d*e - c*f)^4 + (b^2*d^3*f*F^(a + b/(c + d*x))*Log[F]^2)/(6*(d*e - c*f
)^5) - (b^2*d^2*f*F^(a + b/(c + d*x))*Log[F]^2)/(6*(d*e - c*f)^4*(e + f*x))
 + (b^2*d^3*f*F^(a - (b*f)/(d*e - c*f))*ExpIntegralEi[(b*d*(e + f*x)*Log[F]
)/((d*e - c*f)*(c + d*x))]*Log[F]^2)/(d*e - c*f)^5 - (b^3*d^3*f^2*F^(a - (b
*f)/(d*e - c*f))*ExpIntegralEi[(b*d*(e + f*x)*Log[F])/((d*e - c*f)*(c + d*x
))]*Log[F]^3)/(6*(d*e - c*f)^6)
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2254

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/((e_.) + (f_.)*(x_)), x_Symbo
l] :> Dist[d/f, Int[F^(a + b/(c + d*x))/(c + d*x), x], x] - Dist[(d*e - c*f
)/f, Int[F^(a + b/(c + d*x))/((c + d*x)*(e + f*x)), x], x] /; FreeQ[{F, a,
b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
```

Rule 2255

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))*((e_.) + (f_.)*(x_))^(m_), x_
Symbol] :> Simp[(e + f*x)^(m + 1)*(F^(a + b/(c + d*x))/(f*(m + 1))), x] + D
ist[b*d*(Log[F]/(f*(m + 1))), Int[(e + f*x)^(m + 1)*(F^(a + b/(c + d*x))/(c
 + d*x)^2), x], x] /; FreeQ[{F, a, b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
&& ILtQ[m, -1]
```

Rule 2260

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/(((e_.) + (f_.)*(x_))*((g_.)
+ (h_.)*(x_))), x_Symbol] :> Dist[-d/(f*(d*g - c*h)), Subst[Int[F^(a - b*(h
/(d*g - c*h)) + d*b*(x/(d*g - c*h)))/x, x], x, (g + h*x)/(c + d*x)], x] /;
FreeQ[{F, a, b, c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{c+dx}}}{(e+fx)^4}\,dx = -\frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3} - \frac{(bd\log(F))\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^2(e+fx)^3}\,dx}{3f}$$

$$= -\frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3} - \frac{(bd\log(F))\int \left(\frac{d^3F^{a+\frac{b}{c+dx}}}{(de-cf)^3(c+dx)^2} - \frac{3d^3fF^{a+\frac{b}{c+dx}}}{(de-cf)^4(c+dx)} + \frac{f^2F^{a+\frac{b}{c+dx}}}{(de-cf)^2(e+fx)^3} + \frac{2df^2F^{a+}}{(de-cf)^3(e}\right.}{3f}$$

$$= -\frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3} + \frac{(bd^4\log(F))\int \frac{F^{a+\frac{b}{c+dx}}}{c+dx}\,dx}{(de-cf)^4} - \frac{(bd^3f\log(F))\int \frac{F^{a+\frac{b}{c+dx}}}{e+fx}\,dx}{(de-cf)^4} - \frac{(bd^4\log(F))\int}{3f(de-}$$

$$= \frac{d^3F^{a+\frac{b}{c+dx}}}{3f(de-cf)^3} - \frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^2(e+fx)^2} + \frac{2bd^2F^{a+\frac{b}{c+dx}}\log(F)}{3(de-cf)^3(e+fx)} - \frac{bd^3F^a\text{Ei}\big(}{(d}$$

$$= \frac{d^3F^{a+\frac{b}{c+dx}}}{3f(de-cf)^3} - \frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^2(e+fx)^2} + \frac{2bd^2F^{a+\frac{b}{c+dx}}\log(F)}{3(de-cf)^3(e+fx)} - \frac{(bd^3\log(F}{}$$

$$= \frac{d^3F^{a+\frac{b}{c+dx}}}{3f(de-cf)^3} - \frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^2(e+fx)^2} + \frac{2bd^2F^{a+\frac{b}{c+dx}}\log(F)}{3(de-cf)^3(e+fx)} - \frac{bd^3F^{a-\frac{b}{de-}}}{}$$

$$= \frac{d^3F^{a+\frac{b}{c+dx}}}{3f(de-cf)^3} - \frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3} - \frac{5bd^3F^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^4} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^2(e+fx)^2} + \frac{2bd^2F^{a+}}{3(de-cf}$$

$$= \frac{d^3F^{a+\frac{b}{c+dx}}}{3f(de-cf)^3} - \frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3} - \frac{5bd^3F^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^4} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^2(e+fx)^2} + \frac{2bd^2F^{a+}}{3(de-cf}$$

$$= \frac{d^3F^{a+\frac{b}{c+dx}}}{3f(de-cf)^3} - \frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3} - \frac{5bd^3F^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^4} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^2(e+fx)^2} + \frac{2bd^2F^{a+}}{3(de-cf}$$

$$= \frac{d^3F^{a+\frac{b}{c+dx}}}{3f(de-cf)^3} - \frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3} - \frac{5bd^3F^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^4} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^2(e+fx)^2} + \frac{2bd^2F^{a+}}{3(de-cf}$$

$$= \frac{d^3F^{a+\frac{b}{c+dx}}}{3f(de-cf)^3} - \frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3} - \frac{5bd^3F^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^4} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^2(e+fx)^2} + \frac{2bd^2F^{a+}}{3(de-cf}$$

$$= \frac{d^3F^{a+\frac{b}{c+dx}}}{3f(de-cf)^3} - \frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3} - \frac{5bd^3F^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^4} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^2(e+fx)^2} + \frac{2bd^2F^{a+}}{3(de-cf}$$

Mathematica [F]
time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{c+dx}}}{(e+fx)^4}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[F^(a + b/(c + d*x))/(e + f*x)^4,x]
[Out] Integrate[F^(a + b/(c + d*x))/(e + f*x)^4, x]
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 921 vs. $2(444) = 888$.
time = 0.14, size = 922, normalized size = 2.00

method	result
risch	$\frac{b^3 d^3 \ln(F)^3 f^2 F^a F^{\frac{b}{dx+c}}}{3(cf-ed)^6 \left(\frac{b\ln(F)}{dx+c}+\ln(F)a-\frac{\ln(F)acf}{cf-ed}+\frac{\ln(F)ade}{cf-ed}-\frac{\ln(F)bf}{cf-ed}\right)^3}+\frac{b^3 d^3 \ln(F)^3 f^2 F^a F^{\frac{b}{dx+c}}}{6(cf-ed)^6 \left(\frac{b\ln(F)}{dx+c}+\ln(F)a-\frac{\ln(F)acf}{cf-ed}+\frac{\ln(F)ade}{cf-ed}-\frac{\ln(F)bf}{cf-ed}\right)^2}+$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c))/(f*x+e)^4,x,method=_RETURNVERBOSE)
[Out] 1/3*b^3*d^3*ln(F)^3*f^2/(c*f-d*e)^6*F^a*F^(b/(d*x+c))/(b*ln(F)/(d*x+c)+ln(F
)*a-1/(c*f-d*e)*ln(F)*a*c*f+1/(c*f-d*e)*ln(F)*a*d*e-1/(c*f-d*e)*ln(F)*b*f)^
3+1/6*b^3*d^3*ln(F)^3*f^2/(c*f-d*e)^6*F^a*F^(b/(d*x+c))/(b*ln(F)/(d*x+c)+ln
(F)*a-1/(c*f-d*e)*ln(F)*a*c*f+1/(c*f-d*e)*ln(F)*a*d*e-1/(c*f-d*e)*ln(F)*b*f
)^2+1/6*b^3*d^3*ln(F)^3*f^2/(c*f-d*e)^6*F^a*F^(b/(d*x+c))/(b*ln(F)/(d*x+c)+
ln(F)*a-1/(c*f-d*e)*ln(F)*a*c*f+1/(c*f-d*e)*ln(F)*a*d*e-1/(c*f-d*e)*ln(F)*b
*f)+1/6*b^3*d^3*ln(F)^3*f^2/(c*f-d*e)^6*F^((a*c*f-a*d*e+b*f)/(c*f-d*e))*Ei(
1,-b*ln(F)/(d*x+c)-ln(F)*a-(-ln(F)*a*c*f+ln(F)*a*d*e-ln(F)*b*f)/(c*f-d*e))+
b^2*d^3*ln(F)^2*f/(c*f-d*e)^5*F^a*F^(b/(d*x+c))/(b*ln(F)/(d*x+c)+ln(F)*a-1/
(c*f-d*e)*ln(F)*a*c*f+1/(c*f-d*e)*ln(F)*a*d*e-1/(c*f-d*e)*ln(F)*b*f)^2+b^2*
d^3*ln(F)^2*f/(c*f-d*e)^5*F^a*F^(b/(d*x+c))/(b*ln(F)/(d*x+c)+ln(F)*a-1/(c*f
-d*e)*ln(F)*a*c*f+1/(c*f-d*e)*ln(F)*a*d*e-1/(c*f-d*e)*ln(F)*b*f)+b^2*d^3*ln
(F)^2*f/(c*f-d*e)^5*F^((a*c*f-a*d*e+b*f)/(c*f-d*e))*Ei(1,-b*ln(F)/(d*x+c)-l
n(F)*a-(-ln(F)*a*c*f+ln(F)*a*d*e-ln(F)*b*f)/(c*f-d*e))+b*d^3*ln(F)/(c*f-d*e
)^4*F^a*F^(b/(d*x+c))/(b*ln(F)/(d*x+c)+ln(F)*a-1/(c*f-d*e)*ln(F)*a*c*f+1/(c
*f-d*e)*ln(F)*a*d*e-1/(c*f-d*e)*ln(F)*b*f)+b*d^3*ln(F)/(c*f-d*e)^4*F^((a*c*
f-a*d*e+b*f)/(c*f-d*e))*Ei(1,-b*ln(F)/(d*x+c)-ln(F)*a-(-ln(F)*a*c*f+ln(F)*a
*d*e-ln(F)*b*f)/(c*f-d*e))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(f*x+e)^4,x, algorithm="maxima")
[Out] integrate(F^(a + b/(d*x + c))/(f*x + e)^4, x)
```

Fricas [**B**] Leaf count of result is larger than twice the leaf count of optimal. 1368 vs. $2(467) = 934$.
time = 0.45, size = 1368, normalized size = 2.97

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(f*x+e)^4,x, algorithm="fricas")
```

```
[Out] -1/6*((2*c^3*d^3*f^5*x^3 + 2*c^6*f^5 + (b^2*c*d^3*f^5*x^3 + b^2*c^2*d^2*f^5
*x^2 - (b^2*d^4*f^2*x + b^2*c*d^3*f^2)*e^3 - (2*b^2*d^4*f^3*x^2 + b^2*c*d^3
*f^3*x - b^2*c^2*d^2*f^3)*e^2 - (b^2*d^4*f^4*x^3 - b^2*c*d^3*f^4*x^2 - 2*b^
2*c^2*d^2*f^4*x)*e)*log(F)^2 - 6*(d^6*x + c*d^5)*e^5 - 6*(d^6*f*x^2 - 3*c*d
^5*f*x - 4*c^2*d^4*f)*e^4 - 2*(d^6*f^2*x^3 - 9*c*d^5*f^2*x^2 + 9*c^2*d^4*f^
2*x + 19*c^3*d^3*f^2)*e^3 + 6*(c*d^5*f^3*x^3 - 3*c^2*d^4*f^3*x^2 + c^3*d^3*
f^3*x + 5*c^4*d^2*f^3)*e^2 - 6*(c^2*d^4*f^4*x^3 - c^3*d^3*f^4*x^2 + 2*c^5*d
*f^4)*e + (5*b*c^2*d^3*f^5*x^3 + 4*b*c^3*d^2*f^5*x^2 - b*c^4*d*f^5*x + 6*(b
*d^5*f*x + b*c*d^4*f)*e^4 + (11*b*d^5*f^2*x^2 - 2*b*c*d^4*f^2*x - 13*b*c^2*
d^3*f^2)*e^3 + (5*b*d^5*f^3*x^3 - 18*b*c*d^4*f^3*x^2 - 15*b*c^2*d^3*f^3*x +
 8*b*c^3*d^2*f^3)*e^2 - (10*b*c*d^4*f^4*x^3 - 3*b*c^2*d^3*f^4*x^2 - 12*b*c^
3*d^2*f^4*x + b*c^4*d*f^4)*e)*log(F))*F^((a*d*x + a*c + b)/(d*x + c)) + ((b
^3*d^3*f^5*x^3 + 3*b^3*d^3*f^4*x^2*e + 3*b^3*d^3*f^3*x*e^2 + b^3*d^3*f^2*e^
3)*log(F)^3 + 6*(b^2*c*d^3*f^5*x^3 - b^2*d^4*f*e^4 - (3*b^2*d^4*f^2*x - b^2
*c*d^3*f^2)*e^3 - 3*(b^2*d^4*f^3*x^2 - b^2*c*d^3*f^3*x)*e^2 - (b^2*d^4*f^4*
x^3 - 3*b^2*c*d^3*f^4*x^2)*e)*log(F)^2 + 6*(b*c^2*d^3*f^5*x^3 + b*d^5*e^5 +
 (3*b*d^5*f*x - 2*b*c*d^4*f)*e^4 + (3*b*d^5*f^2*x^2 - 6*b*c*d^4*f^2*x + b*c
^2*d^3*f^2)*e^3 + (b*d^5*f^3*x^3 - 6*b*c*d^4*f^3*x^2 + 3*b*c^2*d^3*f^3*x)*e
^2 - (2*b*c*d^4*f^4*x^3 - 3*b*c^2*d^3*f^4*x^2)*e)*log(F))*Ei(-(b*d*f*x + b*
d*e)*log(F)/(c*d*f*x + c^2*f - (d^2*x + c*d)*e))/F^((a*d*e - (a*c + b)*f)/(
c*f - d*e)))/(c^6*f^9*x^3 + d^6*e^9 + 3*(d^6*f*x - 2*c*d^5*f)*e^8 + 3*(d^6*
f^2*x^2 - 6*c*d^5*f^2*x + 5*c^2*d^4*f^2)*e^7 + (d^6*f^3*x^3 - 18*c*d^5*f^3*
x^2 + 45*c^2*d^4*f^3*x - 20*c^3*d^3*f^3)*e^6 - 3*(2*c*d^5*f^4*x^3 - 15*c^2*
d^4*f^4*x^2 + 20*c^3*d^3*f^4*x - 5*c^4*d^2*f^4)*e^5 + 3*(5*c^2*d^4*f^5*x^3
- 20*c^3*d^3*f^5*x^2 + 15*c^4*d^2*f^5*x - 2*c^5*d*f^5)*e^4 - (20*c^3*d^3*f^
6*x^3 - 45*c^4*d^2*f^6*x^2 + 18*c^5*d*f^6*x - c^6*f^6)*e^3 + 3*(5*c^4*d^2*f
^7*x^3 - 6*c^5*d*f^7*x^2 + c^6*f^7*x)*e^2 - 3*(2*c^5*d*f^8*x^3 - c^6*f^8*x^
2)*e)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))/(f*x+e)**4,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(f*x+e)^4,x, algorithm="giac")
[Out] integrate(F^(a + b/(d*x + c))/(f*x + e)^4, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{F^{a+\frac{b}{c+d\,x}}}{{\left(e+f\,x\right)}^4} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))/(e + f*x)^4,x)
[Out] int(F^(a + b/(c + d*x))/(e + f*x)^4, x)
```

3.401 $\int e^{\frac{e}{c+dx}}(a+bx)^4\,dx$

Optimal. Leaf size=346

$$\frac{(bc-ad)^4e^{\frac{e}{c+dx}}(c+dx)}{d^5}-\frac{2b(bc-ad)^3ee^{\frac{e}{c+dx}}(c+dx)}{d^5}+\frac{b^2(bc-ad)^2e^2e^{\frac{e}{c+dx}}(c+dx)}{d^5}-\frac{2b(bc-ad)^3e^{\frac{e}{c+dx}}(c+d$$

```
[Out] (-a*d+b*c)^4*exp(e/(d*x+c))*(d*x+c)/d^5-2*b*(-a*d+b*c)^3*e*exp(e/(d*x+c))*(
d*x+c)/d^5+b^2*(-a*d+b*c)^2*e^2*exp(e/(d*x+c))*(d*x+c)/d^5-2*b*(-a*d+b*c)^3
*exp(e/(d*x+c))*(d*x+c)^2/d^5+b^2*(-a*d+b*c)^2*e*exp(e/(d*x+c))*(d*x+c)^2/d
^5+2*b^2*(-a*d+b*c)^2*exp(e/(d*x+c))*(d*x+c)^3/d^5-(-a*d+b*c)^4*e*Ei(e/(d*x
+c))/d^5+2*b*(-a*d+b*c)^3*e^2*Ei(e/(d*x+c))/d^5-b^2*(-a*d+b*c)^2*e^3*Ei(e/(
d*x+c))/d^5+b^4*(d*x+c)^5*Ei(6,-e/(d*x+c))/d^5-4*b^3*(-a*d+b*c)*(d*x+c)^4*E
i(5,-e/(d*x+c))/d^5
```

Rubi [A]
time = 0.25, antiderivative size = 346, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.263$, Rules used = {2258, 2237, 2241, 2245, 2250}

$$-\frac{4b^3e^4(bc-ad)\text{Gamma}\left(-4,-\frac{e}{c+dx}\right)}{d^5}-\frac{b^4e^5\text{Gamma}\left(-5,-\frac{e}{c+dx}\right)}{d^5}-\frac{b^2e^3(bc-ad)^2\text{Ei}\left(\frac{e}{c+dx}\right)}{d^5}+\frac{b^2e^2(c+dx)(bc-ad)^2e^{\frac{e}{c+dx}}}{d^5}+\frac{b^2e(c+dx)^2(bc-ad)^2e^{\frac{e}{c+dx}}}{d^5}+\frac{2b^2(c+dx)^3(bc-ad)^2e^{\frac{e}{c+dx}}}{d^5}+\frac{2be^2(bc-ad)^3\text{Ei}\left(\frac{e}{c+dx}\right)}{d^5}-\frac{e(bc-ad)^4\text{Ei}\left(\frac{e}{c+dx}\right)}{d^5}-\frac{2be(c+dx)(bc-ad)^3e^{\frac{e}{c+dx}}}{d^5}-\frac{2b(c+dx)^2(bc-ad)^3e^{\frac{e}{c+dx}}}{d^5}+\frac{(c+dx)(bc-ad)^4e^{\frac{e}{c+dx}}}{d^5}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x))*(a + b*x)^4,x]
```

```
[Out] ((b*c - a*d)^4*E^(e/(c + d*x))*(c + d*x))/d^5 - (2*b*(b*c - a*d)^3*e*E^(e/(
c + d*x))*(c + d*x))/d^5 + (b^2*(b*c - a*d)^2*e^2*E^(e/(c + d*x))*(c + d*x)
)/d^5 - (2*b*(b*c - a*d)^3*E^(e/(c + d*x))*(c + d*x)^2)/d^5 + (b^2*(b*c - a
*d)^2*e*E^(e/(c + d*x))*(c + d*x)^2)/d^5 + (2*b^2*(b*c - a*d)^2*E^(e/(c + d
*x))*(c + d*x)^3)/d^5 - ((b*c - a*d)^4*e*ExpIntegralEi[e/(c + d*x)])/d^5 +
(2*b*(b*c - a*d)^3*e^2*ExpIntegralEi[e/(c + d*x)])/d^5 - (b^2*(b*c - a*d)^2
*e^3*ExpIntegralEi[e/(c + d*x)])/d^5 - (b^4*e^5*Gamma[-5, -(e/(c + d*x))])/
d^5 - (4*b^3*(b*c - a*d)*e^4*Gamma[-4, -(e/(c + d*x))])/d^5
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int e^{\frac{e}{c+dx}}(a+bx)^4\,dx = \int \left(\frac{(-bc+ad)^4 e^{\frac{e}{c+dx}}}{d^4} - \frac{4b(bc-ad)^3 e^{\frac{e}{c+dx}}(c+dx)}{d^4} + \frac{6b^2(bc-ad)^2 e^{\frac{e}{c+dx}}(c+dx)^2}{d^4} \right.$$

$$= \frac{b^4\int e^{\frac{e}{c+dx}}(c+dx)^4\,dx}{d^4} - \frac{(4b^3(bc-ad))\int e^{\frac{e}{c+dx}}(c+dx)^3\,dx}{d^4} + \frac{(6b^2(bc-ad)^2)\int e^{\frac{e}{c+d}}}{d^4}$$

$$= \frac{(bc-ad)^4 e^{\frac{e}{c+dx}}(c+dx)}{d^5} - \frac{2b(bc-ad)^3 e^{\frac{e}{c+dx}}(c+dx)^2}{d^5} + \frac{2b^2(bc-ad)^2 e^{\frac{e}{c+dx}}(c+dx)}{d^5}$$

$$= \frac{(bc-ad)^4 e^{\frac{e}{c+dx}}(c+dx)}{d^5} - \frac{2b(bc-ad)^3 e e^{\frac{e}{c+dx}}(c+dx)}{d^5} - \frac{2b(bc-ad)^3 e^{\frac{e}{c+dx}}(c+dx)^2}{d^5}$$

$$= \frac{(bc-ad)^4 e^{\frac{e}{c+dx}}(c+dx)}{d^5} - \frac{2b(bc-ad)^3 e e^{\frac{e}{c+dx}}(c+dx)}{d^5} + \frac{b^2(bc-ad)^2 e^2 e^{\frac{e}{c+dx}}(c+dx}{d^5}$$

$$= \frac{(bc-ad)^4 e^{\frac{e}{c+dx}}(c+dx)}{d^5} - \frac{2b(bc-ad)^3 e e^{\frac{e}{c+dx}}(c+dx)}{d^5} + \frac{b^2(bc-ad)^2 e^2 e^{\frac{e}{c+dx}}(c+dx}{d^5}$$

Mathematica [A]
time = 0.37, size = 468, normalized size = 1.35

$$\frac{c(120a^4d^4-240a^3bd^3(c-e)+120a^2b^2d^2(2c^2-5ce+e^2)-20ab^3d(6c^3-26c^2e+11ce^2-e^3)+b^4(24c^4-154c^3e+102c^2e^2-19ce^3+e^4))e^{\frac{e}{c+dx}}}{120d^5}+\frac{de^{\frac{e}{c+dx}}x(120a^4d^4+240a^3bd^3(e+dx)+120a^2b^2d^2(-4ce+e^2+dex+2d^2x^2)+20ab^3d(18c^2e+e^3+de^2x+2d^2ex^2+6d^3x^3-2ce(5e+3dx))+b^4(-96c^3e+e^4+de^3x+2d^2e^2x^2+6d^3ex^3+24d^4x^4+2c^2e(43e+18dx)-2ce(9e^2+7dex+8d^2x^2)))-e(120a^4d^4-240a^3bd^3(2c-e)+120a^2b^2d^2(6c^2-6ce+e^2)-20ab^3d(24c^3-36c^2e+12ce^2-e^3)+b^4(120c^4-240c^3e+120c^2e^2-20ce^3+e^4))\,\mathrm{Ei}\left(\frac{e}{c+dx}\right)}{120d^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x))*(a + b*x)^4,x]
```

```
[Out] (c*(120*a^4*d^4 - 240*a^3*b*d^3*(c - e) + 120*a^2*b^2*d^2*(2*c^2 - 5*c*e +
e^2) - 20*a*b^3*d*(6*c^3 - 26*c^2*e + 11*c*e^2 - e^3) + b^4*(24*c^4 - 154*c
^3*e + 102*c^2*e^2 - 19*c*e^3 + e^4))*E^(e/(c + d*x)))/(120*d^5) + (d*E^(e/
(c + d*x))*x*(120*a^4*d^4 + 240*a^3*b*d^3*(e + d*x) + 120*a^2*b^2*d^2*(-4*c
*e + e^2 + d*e*x + 2*d^2*x^2) + 20*a*b^3*d*(18*c^2*e + e^3 + d*e^2*x + 2*d^
2*e*x^2 + 6*d^3*x^3 - 2*c*e*(5*e + 3*d*x)) + b^4*(-96*c^3*e + e^4 + d*e^3*x
 + 2*d^2*e^2*x^2 + 6*d^3*e*x^3 + 24*d^4*x^4 + 2*c^2*e*(43*e + 18*d*x) - 2*c
*e*(9*e^2 + 7*d*e*x + 8*d^2*x^2))) - e*(120*a^4*d^4 - 240*a^3*b*d^3*(2*c -
e) + 120*a^2*b^2*d^2*(6*c^2 - 6*c*e + e^2) - 20*a*b^3*d*(24*c^3 - 36*c^2*e
+ 12*c*e^2 - e^3) + b^4*(120*c^4 - 240*c^3*e + 120*c^2*e^2 - 20*c*e^3 + e^4
))*ExpIntegralEi[e/(c + d*x)])/(120*d^5)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 1145 vs. $2(347) = 694$.
time = 0.12, size = 1146, normalized size = 3.31

method	result	size
derivativedivides	Expression too large to display	1146
default	Expression too large to display	1146
risch	Expression too large to display	1273

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(d*x+c))*(b*x+a)^4,x,method=_RETURNVERBOSE)
```

```
[Out] -1/d*e*(a^4*(-(d*x+c)/e*exp(e/(d*x+c))-Ei(1,-e/(d*x+c)))+b^4/d^4*e^4*(-1/5*
(d*x+c)^5/e^5*exp(e/(d*x+c))-1/20*(d*x+c)^4/e^4*exp(e/(d*x+c))-1/60*(d*x+c)
^3/e^3*exp(e/(d*x+c))-1/120*exp(e/(d*x+c))*(d*x+c)^2/e^2-1/120*(d*x+c)/e*ex
p(e/(d*x+c))-1/120*Ei(1,-e/(d*x+c)))+b^4/d^4*c^4*(-(d*x+c)/e*exp(e/(d*x+c))
-Ei(1,-e/(d*x+c)))+4*b^3/d^3*e^3*a*(-1/4*(d*x+c)^4/e^4*exp(e/(d*x+c))-1/12*
(d*x+c)^3/e^3*exp(e/(d*x+c))-1/24*exp(e/(d*x+c))*(d*x+c)^2/e^2-1/24*(d*x+c)
/e*exp(e/(d*x+c))-1/24*Ei(1,-e/(d*x+c)))-4*b^4/d^4*e^3*c*(-1/4*(d*x+c)^4/e^
4*exp(e/(d*x+c))-1/12*(d*x+c)^3/e^3*exp(e/(d*x+c))-1/24*exp(e/(d*x+c))*(d*x
+c)^2/e^2-1/24*(d*x+c)/e*exp(e/(d*x+c))-1/24*Ei(1,-e/(d*x+c)))+6*b^2/d^2*e^
2*a^2*(-1/3*(d*x+c)^3/e^3*exp(e/(d*x+c))-1/6*exp(e/(d*x+c))*(d*x+c)^2/e^2-1
/6*(d*x+c)/e*exp(e/(d*x+c))-1/6*Ei(1,-e/(d*x+c)))+6*b^4/d^4*e^2*c^2*(-1/3*(
d*x+c)^3/e^3*exp(e/(d*x+c))-1/6*exp(e/(d*x+c))*(d*x+c)^2/e^2-1/6*(d*x+c)/e*
exp(e/(d*x+c))-1/6*Ei(1,-e/(d*x+c)))+4*b/d*e*a^3*(-1/2*exp(e/(d*x+c))*(d*x+
c)^2/e^2-1/2*(d*x+c)/e*exp(e/(d*x+c))-1/2*Ei(1,-e/(d*x+c)))-4*b^4/d^4*e*c^3
*(-1/2*exp(e/(d*x+c))*(d*x+c)^2/e^2-1/2*(d*x+c)/e*exp(e/(d*x+c))-1/2*Ei(1,-
e/(d*x+c)))-4*b/d*c*a^3*(-(d*x+c)/e*exp(e/(d*x+c))-Ei(1,-e/(d*x+c)))+6*b^2/
d^2*c^2*a^2*(-(d*x+c)/e*exp(e/(d*x+c))-Ei(1,-e/(d*x+c)))-4*b^3/d^3*c^3*a*(-
```

```
(d*x+c)/e*exp(e/(d*x+c))-Ei(1,-e/(d*x+c)))-12*b^3/d^3*e^2*c*a*(-1/3*(d*x+c)
^3/e^3*exp(e/(d*x+c))-1/6*exp(e/(d*x+c))*(d*x+c)^2/e^2-1/6*(d*x+c)/e*exp(e/
(d*x+c))-1/6*Ei(1,-e/(d*x+c)))-12*b^2/d^2*e*c*a^2*(-1/2*exp(e/(d*x+c))*(d*x
+c)^2/e^2-1/2*(d*x+c)/e*exp(e/(d*x+c))-1/2*Ei(1,-e/(d*x+c)))+12*b^3/d^3*e*c
^2*a*(-1/2*exp(e/(d*x+c))*(d*x+c)^2/e^2-1/2*(d*x+c)/e*exp(e/(d*x+c))-1/2*Ei
(1,-e/(d*x+c))))
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a)^4,x, algorithm="maxima")
```

```
[Out] 1/120*(24*b^4*d^4*x^5 + 6*(20*a*b^3*d^4 + b^4*d^3*e)*x^4 + 2*(120*a^2*b^2*d
^4 + 20*a*b^3*d^3*e - (8*c*d^2*e - d^2*e^2)*b^4)*x^3 + (240*a^3*b*d^4 + 120
*a^2*b^2*d^3*e - 20*(6*c*d^2*e - d^2*e^2)*a*b^3 + (36*c^2*d*e - 14*c*d*e^2
+ d*e^3)*b^4)*x^2 + (120*a^4*d^4 + 240*a^3*b*d^3*e - 120*(4*c*d^2*e - d^2*e
^2)*a^2*b^2 + 20*(18*c^2*d*e - 10*c*d*e^2 + d*e^3)*a*b^3 - (96*c^3*e - 86*c
^2*e^2 + 18*c*e^3 - e^4)*b^4)*x)*e^(e/(d*x + c))/d^4 + integrate(-1/120*(24
0*a^3*b*c^2*d^3*e - 120*(4*c^3*d^2*e - c^2*d^2*e^2)*a^2*b^2 + 20*(18*c^4*d*
e - 10*c^3*d*e^2 + c^2*d*e^3)*a*b^3 - (96*c^5*e - 86*c^4*e^2 + 18*c^3*e^3 -
 c^2*e^4)*b^4 - (120*a^4*d^5*e - 240*(2*c*d^4*e - d^4*e^2)*a^3*b + 120*(6*c
^2*d^3*e - 6*c*d^3*e^2 + d^3*e^3)*a^2*b^2 - 20*(24*c^3*d^2*e - 36*c^2*d^2*e
^2 + 12*c*d^2*e^3 - d^2*e^4)*a*b^3 + (120*c^4*d*e - 240*c^3*d*e^2 + 120*c^2
*d*e^3 - 20*c*d*e^4 + d*e^5)*b^4)*x)*e^(e/(d*x + c))/(d^6*x^2 + 2*c*d^5*x +
 c^2*d^4), x)
```

Fricas [**A**]
time = 0.09, size = 626, normalized size = 1.81

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a)^4,x, algorithm="fricas")
```

```
[Out] -1/120*((b^4*e^5 - 20*(b^4*c - a*b^3*d)*e^4 + 120*(b^4*c^2 - 2*a*b^3*c*d +
a^2*b^2*d^2)*e^3 - 240*(b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d
^3)*e^2 + 120*(b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3
+ a^4*d^4)*e)*Ei(e/(d*x + c)) - (24*b^4*d^5*x^5 + 120*a*b^3*d^5*x^4 + 240*a
^2*b^2*d^5*x^3 + 240*a^3*b*d^5*x^2 + 120*a^4*d^5*x + 24*b^4*c^5 - 120*a*b^3
*c^4*d + 240*a^2*b^2*c^3*d^2 - 240*a^3*b*c^2*d^3 + 120*a^4*c*d^4 + (b^4*d*x
 + b^4*c)*e^4 + (b^4*d^2*x^2 - 19*b^4*c^2 + 20*a*b^3*c*d - 2*(9*b^4*c*d - 1
0*a*b^3*d^2)*x)*e^3 + 2*(b^4*d^3*x^3 + 51*b^4*c^3 - 110*a*b^3*c^2*d + 60*a^
2*b^2*c*d^2 - (7*b^4*c*d^2 - 10*a*b^3*d^3)*x^2 + (43*b^4*c^2*d - 100*a*b^3*
```

```
c*d^2 + 60*a^2*b^2*d^3)*x)*e^2 + 2*(3*b^4*d^4*x^4 - 77*b^4*c^4 + 260*a*b^3*
c^3*d - 300*a^2*b^2*c^2*d^2 + 120*a^3*b*c*d^3 - 4*(2*b^4*c*d^3 - 5*a*b^3*d^
4)*x^3 + 6*(3*b^4*c^2*d^2 - 10*a*b^3*c*d^3 + 10*a^2*b^2*d^4)*x^2 - 12*(4*b^
4*c^3*d - 15*a*b^3*c^2*d^2 + 20*a^2*b^2*c*d^3 - 10*a^3*b*d^4)*x)*e)*e^(e/(d
*x + c)))/d^5
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int (a+bx)^4 e^{\frac{e}{c+dx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a)**4,x)
```

```
[Out] Integral((a + b*x)**4*exp(e/(c + d*x)), x)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 1427 vs. 2(358) = 716.
time = 1.07, size = 1427, normalized size = 4.12

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a)^4,x, algorithm="giac")
```

```
[Out] -1/120*(120*b^4*c^4*Ei(e/(d*x + c))*e^7/(d*x + c)^5 - 480*a*b^3*c^3*d*Ei(e/
(d*x + c))*e^7/(d*x + c)^5 + 720*a^2*b^2*c^2*d^2*Ei(e/(d*x + c))*e^7/(d*x +
 c)^5 - 480*a^3*b*c*d^3*Ei(e/(d*x + c))*e^7/(d*x + c)^5 + 120*a^4*d^4*Ei(e/
(d*x + c))*e^7/(d*x + c)^5 - 24*b^4*e^(e/(d*x + c) + 6) + 120*b^4*c*e^(e/(d
*x + c) + 6)/(d*x + c) - 240*b^4*c^2*e^(e/(d*x + c) + 6)/(d*x + c)^2 + 240*
b^4*c^3*e^(e/(d*x + c) + 6)/(d*x + c)^3 - 120*b^4*c^4*e^(e/(d*x + c) + 6)/(
d*x + c)^4 - 120*a*b^3*d*e^(e/(d*x + c) + 6)/(d*x + c) + 480*a*b^3*c*d*e^(e
/(d*x + c) + 6)/(d*x + c)^2 - 720*a*b^3*c^2*d*e^(e/(d*x + c) + 6)/(d*x + c)
^3 + 480*a*b^3*c^3*d*e^(e/(d*x + c) + 6)/(d*x + c)^4 - 240*a^2*b^2*d^2*e^(e
/(d*x + c) + 6)/(d*x + c)^2 + 720*a^2*b^2*c*d^2*e^(e/(d*x + c) + 6)/(d*x +
c)^3 - 720*a^2*b^2*c^2*d^2*e^(e/(d*x + c) + 6)/(d*x + c)^4 - 240*a^3*b*d^3*
e^(e/(d*x + c) + 6)/(d*x + c)^3 + 480*a^3*b*c*d^3*e^(e/(d*x + c) + 6)/(d*x
+ c)^4 - 120*a^4*d^4*e^(e/(d*x + c) + 6)/(d*x + c)^4 - 240*b^4*c^3*Ei(e/(d*
x + c))*e^8/(d*x + c)^5 + 720*a*b^3*c^2*d*Ei(e/(d*x + c))*e^8/(d*x + c)^5 -
 720*a^2*b^2*c*d^2*Ei(e/(d*x + c))*e^8/(d*x + c)^5 + 240*a^3*b*d^3*Ei(e/(d*
x + c))*e^8/(d*x + c)^5 - 6*b^4*e^(e/(d*x + c) + 7)/(d*x + c) + 40*b^4*c*e^
(e/(d*x + c) + 7)/(d*x + c)^2 - 120*b^4*c^2*e^(e/(d*x + c) + 7)/(d*x + c)^3
 + 240*b^4*c^3*e^(e/(d*x + c) + 7)/(d*x + c)^4 - 40*a*b^3*d*e^(e/(d*x + c)
+ 7)/(d*x + c)^2 + 240*a*b^3*c*d*e^(e/(d*x + c) + 7)/(d*x + c)^3 - 720*a*b^
3*c^2*d*e^(e/(d*x + c) + 7)/(d*x + c)^4 - 120*a^2*b^2*d^2*e^(e/(d*x + c) +
```

```
7)/(d*x + c)^3 + 720*a^2*b^2*c*d^2*e^(e/(d*x + c) + 7)/(d*x + c)^4 - 240*a^
3*b*d^3*e^(e/(d*x + c) + 7)/(d*x + c)^4 + 120*b^4*c^2*Ei(e/(d*x + c))*e^9/(
d*x + c)^5 - 240*a*b^3*c*d*Ei(e/(d*x + c))*e^9/(d*x + c)^5 + 120*a^2*b^2*d^
2*Ei(e/(d*x + c))*e^9/(d*x + c)^5 - 2*b^4*e^(e/(d*x + c) + 8)/(d*x + c)^2 +
 20*b^4*c*e^(e/(d*x + c) + 8)/(d*x + c)^3 - 120*b^4*c^2*e^(e/(d*x + c) + 8)
/(d*x + c)^4 - 20*a*b^3*d*e^(e/(d*x + c) + 8)/(d*x + c)^3 + 240*a*b^3*c*d*e
^(e/(d*x + c) + 8)/(d*x + c)^4 - 120*a^2*b^2*d^2*e^(e/(d*x + c) + 8)/(d*x +
 c)^4 - 20*b^4*c*Ei(e/(d*x + c))*e^10/(d*x + c)^5 + 20*a*b^3*d*Ei(e/(d*x +
c))*e^10/(d*x + c)^5 - b^4*e^(e/(d*x + c) + 9)/(d*x + c)^3 + 20*b^4*c*e^(e/
(d*x + c) + 9)/(d*x + c)^4 - 20*a*b^3*d*e^(e/(d*x + c) + 9)/(d*x + c)^4 + b
^4*Ei(e/(d*x + c))*e^11/(d*x + c)^5 - b^4*e^(e/(d*x + c) + 10)/(d*x + c)^4)
*(d*x + c)^5*e^(-6)/d^5
```

Mupad [F]

time = 0.00, size = -1, normalized size = -0.00

$$\int e^{\frac{e}{c+dx}} (a+bx)^4 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x))*(a + b*x)^4,x)
[Out] int(exp(e/(c + d*x))*(a + b*x)^4, x)
```

3.402 $\int e^{\frac{e}{c+dx}}(a+bx)^3\,dx$

Optimal. Leaf size=320

$$-\frac{(bc-ad)^3e^{\frac{e}{c+dx}}(c+dx)}{d^4}+\frac{3b(bc-ad)^2ee^{\frac{e}{c+dx}}(c+dx)}{2d^4}-\frac{b^2(bc-ad)e^2e^{\frac{e}{c+dx}}(c+dx)}{2d^4}+\frac{3b(bc-ad)^2e^{\frac{e}{c+dx}}(c+}{2d^4}$$

```
[Out] -(-a*d+b*c)^3*exp(e/(d*x+c))*(d*x+c)/d^4+3/2*b*(-a*d+b*c)^2*e*exp(e/(d*x+c)
)*(d*x+c)/d^4-1/2*b^2*(-a*d+b*c)*e^2*exp(e/(d*x+c))*(d*x+c)/d^4+3/2*b*(-a*d
+b*c)^2*exp(e/(d*x+c))*(d*x+c)^2/d^4-1/2*b^2*(-a*d+b*c)*e*exp(e/(d*x+c))*(d
*x+c)^2/d^4-b^2*(-a*d+b*c)*exp(e/(d*x+c))*(d*x+c)^3/d^4+(-a*d+b*c)^3*e*Ei(e
/(d*x+c))/d^4-3/2*b*(-a*d+b*c)^2*e^2*Ei(e/(d*x+c))/d^4+1/2*b^2*(-a*d+b*c)*e
^3*Ei(e/(d*x+c))/d^4+b^3*(d*x+c)^4*Ei(5,-e/(d*x+c))/d^4
```

Rubi [A]
time = 0.21, antiderivative size = 320, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.263$, Rules used = {2258, 2237, 2241, 2245, 2250}

$$\frac{b^3e^4\text{Gamma}\left(-4,-\frac{e}{c+dx}\right)}{d^4}+\frac{b^2e^3(bc-ad)\text{Ei}\left(\frac{e}{c+dx}\right)}{2d^4}-\frac{b^2e^2(c+dx)(bc-ad)e^{\frac{e}{c+dx}}}{2d^4}-\frac{b^2e(c+dx)^2(bc-ad)e^{\frac{e}{c+dx}}}{2d^4}-\frac{b^2(c+dx)^3(bc-ad)e^{\frac{e}{c+dx}}}{d^4}-\frac{3be^2(bc-ad)^2\text{Ei}\left(\frac{e}{c+dx}\right)}{2d^4}+\frac{e(bc-ad)^3\text{Ei}\left(\frac{e}{c+dx}\right)}{d^4}+\frac{3be(c+dx)(bc-ad)^2e^{\frac{e}{c+dx}}}{2d^4}+\frac{3b(c+dx)^2(bc-ad)^2e^{\frac{e}{c+dx}}}{2d^4}-\frac{(c+dx)(bc-ad)^3e^{\frac{e}{c+dx}}}{d^4}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x))*(a + b*x)^3,x]
```

```
[Out] -(((b*c - a*d)^3*E^(e/(c + d*x))*(c + d*x))/d^4) + (3*b*(b*c - a*d)^2*e*E^(
e/(c + d*x))*(c + d*x))/(2*d^4) - (b^2*(b*c - a*d)*e^2*E^(e/(c + d*x))*(c +
 d*x))/(2*d^4) + (3*b*(b*c - a*d)^2*E^(e/(c + d*x))*(c + d*x)^2)/(2*d^4) -
(b^2*(b*c - a*d)*e*E^(e/(c + d*x))*(c + d*x)^2)/(2*d^4) - (b^2*(b*c - a*d)*
E^(e/(c + d*x))*(c + d*x)^3)/d^4 + ((b*c - a*d)^3*e*ExpIntegralEi[e/(c + d*
x)])/d^4 - (3*b*(b*c - a*d)^2*e^2*ExpIntegralEi[e/(c + d*x)])/(2*d^4) + (b^
2*(b*c - a*d)*e^3*ExpIntegralEi[e/(c + d*x)])/(2*d^4) + (b^3*e^4*Gamma[-4,
-(e/(c + d*x))])/d^4
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int e^{\frac{e}{c+dx}}(a+bx)^3\,dx = \int \left(\frac{(-bc+ad)^3 e^{\frac{e}{c+dx}}}{d^3} + \frac{3b(bc-ad)^2 e^{\frac{e}{c+dx}}(c+dx)}{d^3} - \frac{3b^2(bc-ad)e^{\frac{e}{c+dx}}(c+dx)^2}{d^3} + \right.$$

$$= \frac{b^3\int e^{\frac{e}{c+dx}}(c+dx)^3\,dx}{d^3} - \frac{(3b^2(bc-ad))\int e^{\frac{e}{c+dx}}(c+dx)^2\,dx}{d^3} + \frac{(3b(bc-ad)^2)\int e^{\frac{e}{c+dx}}}{d^3}$$

$$= -\frac{(bc-ad)^3 e^{\frac{e}{c+dx}}(c+dx)}{d^4} + \frac{3b(bc-ad)^2 e^{\frac{e}{c+dx}}(c+dx)^2}{2d^4} - \frac{b^2(bc-ad)e^{\frac{e}{c+dx}}(c+dx)}{d^4}$$

$$= -\frac{(bc-ad)^3 e^{\frac{e}{c+dx}}(c+dx)}{d^4} + \frac{3b(bc-ad)^2 e e^{\frac{e}{c+dx}}(c+dx)}{2d^4} + \frac{3b(bc-ad)^2 e^{\frac{e}{c+dx}}(c+dx}{2d^4}$$

$$= -\frac{(bc-ad)^3 e^{\frac{e}{c+dx}}(c+dx)}{d^4} + \frac{3b(bc-ad)^2 e e^{\frac{e}{c+dx}}(c+dx)}{2d^4} - \frac{b^2(bc-ad)e^2 e^{\frac{e}{c+dx}}(c+d}{2d^4}$$

$$= -\frac{(bc-ad)^3 e^{\frac{e}{c+dx}}(c+dx)}{d^4} + \frac{3b(bc-ad)^2 e e^{\frac{e}{c+dx}}(c+dx)}{2d^4} - \frac{b^2(bc-ad)e^2 e^{\frac{e}{c+dx}}(c+d}{2d^4}$$

Mathematica [A]

time = 0.24, size = 292, normalized size = 0.91

$$-\frac{c(-24a^3d^3+36a^2bd^2(c-e)-12ab^2d(2c^2-5ce+e^2)+b^3(6c^3-26c^2e+11ce^2-e^3))\,e^{\frac{e}{c+dx}}}{24d^4} + \frac{de^{\frac{e}{c+dx}}x(24a^3d^3+36a^2bd^2(e+dx)+12ab^2d(-4ce+e^2+dex+2d^2x^2)+b^3(18c^2e+e^3+de^2x+2d^2ex^2+6d^3x^3-2ce(5e+3dx))) - e(24a^3d^3+36a^2bd^2(-2c+e)+12ab^2d(6c^2-6ce+e^2)+b^3(-24c^3+36c^2e-12ce^2+e^3))\,\mathrm{Ei}\left(\frac{e}{c+dx}\right)}{24d^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x))*(a + b*x)^3,x]
```

```
[Out] -1/24*(c*(-24*a^3*d^3 + 36*a^2*b*d^2*(c - e) - 12*a*b^2*d*(2*c^2 - 5*c*e +
e^2) + b^3*(6*c^3 - 26*c^2*e + 11*c*e^2 - e^3))*E^(e/(c + d*x)))/d^4 + (d*E
^(e/(c + d*x))*x*(24*a^3*d^3 + 36*a^2*b*d^2*(e + d*x) + 12*a*b^2*d*(-4*c*e
+ e^2 + d*e*x + 2*d^2*x^2) + b^3*(18*c^2*e + e^3 + d*e^2*x + 2*d^2*e*x^2 +
6*d^3*x^3 - 2*c*e*(5*e + 3*d*x))) - e*(24*a^3*d^3 + 36*a^2*b*d^2*(-2*c + e)
 + 12*a*b^2*d*(6*c^2 - 6*c*e + e^2) + b^3*(-24*c^3 + 36*c^2*e - 12*c*e^2 +
e^3))*ExpIntegralEi[e/(c + d*x)])/(24*d^4)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 681 vs. $2(306) = 612$.
time = 0.07, size = 682, normalized size = 2.13 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(d*x+c))*(b*x+a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/d*e*(a^3*(-(d*x+c)/e*exp(e/(d*x+c))-Ei(1,-e/(d*x+c)))+b^3/d^3*e^3*(-1/4*
(d*x+c)^4/e^4*exp(e/(d*x+c))-1/12*(d*x+c)^3/e^3*exp(e/(d*x+c))-1/24*exp(e/(
d*x+c))*(d*x+c)^2/e^2-1/24*(d*x+c)/e*exp(e/(d*x+c))-1/24*Ei(1,-e/(d*x+c)))-
b^3/d^3*c^3*(-(d*x+c)/e*exp(e/(d*x+c))-Ei(1,-e/(d*x+c)))+3*b^2/d^2*e^2*a*(-
1/3*(d*x+c)^3/e^3*exp(e/(d*x+c))-1/6*exp(e/(d*x+c))*(d*x+c)^2/e^2-1/6*(d*x+
c)/e*exp(e/(d*x+c))-1/6*Ei(1,-e/(d*x+c)))-3*b^3/d^3*e^2*c*(-1/3*(d*x+c)^3/e
^3*exp(e/(d*x+c))-1/6*exp(e/(d*x+c))*(d*x+c)^2/e^2-1/6*(d*x+c)/e*exp(e/(d*x
+c))-1/6*Ei(1,-e/(d*x+c)))+3*b/d*e*a^2*(-1/2*exp(e/(d*x+c))*(d*x+c)^2/e^2-1
/2*(d*x+c)/e*exp(e/(d*x+c))-1/2*Ei(1,-e/(d*x+c)))+3*b^3/d^3*e*c^2*(-1/2*exp
(e/(d*x+c))*(d*x+c)^2/e^2-1/2*(d*x+c)/e*exp(e/(d*x+c))-1/2*Ei(1,-e/(d*x+c))
)-3*b/d*c*a^2*(-(d*x+c)/e*exp(e/(d*x+c))-Ei(1,-e/(d*x+c)))+3*b^2/d^2*c^2*a*
(-(d*x+c)/e*exp(e/(d*x+c))-Ei(1,-e/(d*x+c)))-6*b^2/d^2*e*c*a*(-1/2*exp(e/(d
*x+c))*(d*x+c)^2/e^2-1/2*(d*x+c)/e*exp(e/(d*x+c))-1/2*Ei(1,-e/(d*x+c))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a)^3,x, algorithm="maxima")
```

```
[Out] 1/24*(6*b^3*d^3*x^4 + 2*(12*a*b^2*d^3 + b^3*d^2*e)*x^3 + (36*a^2*b*d^3 + 12
*a*b^2*d^2*e - (6*c*d*e - d*e^2)*b^3)*x^2 + (24*a^3*d^3 + 36*a^2*b*d^2*e -
12*(4*c*d*e - d*e^2)*a*b^2 + (18*c^2*e - 10*c*e^2 + e^3)*b^3)*x)*e^(e/(d*x
+ c))/d^3 + integrate(-1/24*(36*a^2*b*c^2*d^2*e - 12*(4*c^3*d*e - c^2*d*e^2
)*a*b^2 + (18*c^4*e - 10*c^3*e^2 + c^2*e^3)*b^3 - (24*a^3*d^4*e - 36*(2*c*d
^3*e - d^3*e^2)*a^2*b + 12*(6*c^2*d^2*e - 6*c*d^2*e^2 + d^2*e^3)*a*b^2 - (2
```

```
4*c^3*d*e - 36*c^2*d*e^2 + 12*c*d*e^3 - d*e^4)*b^3)*x)*e^(e/(d*x + c))/(d^5
*x^2 + 2*c*d^4*x + c^2*d^3), x)
```

Fricas [A]
time = 0.08, size = 370, normalized size = 1.16

$$-\frac{\left(b^3e^4-12\left(b^3c-ab^2d\right)e^3+36\left(b^3c^2-2\,ab^2cd+a^2bd^2\right)e^2-24\left(b^3c^3-3\,ab^2c^2d+3\,a^2bcd^2-a^3d^3\right)e\right)\mathrm{Ei}\left(\frac{e}{dx+c}\right)-\left(6\,b^3d^4x^4+24\,ab^2d^4x^3+36\,a^2bd^4x^2+24\,a^3d^4x-6\,b^3c^4+24\,ab^2c^3d-36\,a^2bc^2d^2+24\,a^3cd^3+\left(b^3dx+b^3c\right)e^3+\left(b^3d^2x^2-11\,b^3c^2+12\,ab^2cd-2\left(5\,b^3cd-6\,ab^2d^2\right)x\right)e^2+2\left(b^3d^3x^3+13\,b^3c^3-30\,ab^2c^2d+18\,a^2bcd^2-3\left(b^3cd^2-2\,ab^2d^3\right)x^2+3\left(3\,b^3c^2d-8\,ab^2cd^2+6\,a^2bd^3\right)x\right)e\right)e^{\left(\frac{e}{dx+c}\right)}}{24\,d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a)^3,x, algorithm="fricas")
```

```
[Out] -1/24*((b^3*e^4 - 12*(b^3*c - a*b^2*d)*e^3 + 36*(b^3*c^2 - 2*a*b^2*c*d + a^
2*b*d^2)*e^2 - 24*(b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*e)*Ei
(e/(d*x + c)) - (6*b^3*d^4*x^4 + 24*a*b^2*d^4*x^3 + 36*a^2*b*d^4*x^2 + 24*a
^3*d^4*x - 6*b^3*c^4 + 24*a*b^2*c^3*d - 36*a^2*b*c^2*d^2 + 24*a^3*c*d^3 + (
b^3*d*x + b^3*c)*e^3 + (b^3*d^2*x^2 - 11*b^3*c^2 + 12*a*b^2*c*d - 2*(5*b^3*
c*d - 6*a*b^2*d^2)*x)*e^2 + 2*(b^3*d^3*x^3 + 13*b^3*c^3 - 30*a*b^2*c^2*d +
18*a^2*b*c*d^2 - 3*(b^3*c*d^2 - 2*a*b^2*d^3)*x^2 + 3*(3*b^3*c^2*d - 8*a*b^2
*c*d^2 + 6*a^2*b*d^3)*x)*e)*e^(e/(d*x + c)))/d^4
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int (a+bx)^3\,e^{\frac{e}{c+dx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a)**3,x)
```

```
[Out] Integral((a + b*x)**3*exp(e/(c + d*x)), x)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 830 vs. 2(316) = 632.
time = 1.27, size = 830, normalized size = 2.59

$$\frac{\left(\frac{24\,b^3c^3\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^6}{(dx+c)^4}-\frac{72\,ab^2c^2d\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^6}{(dx+c)^4}+\frac{72\,a^2bcd^2\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^6}{(dx+c)^4}-\frac{24\,a^3d^3\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^6}{(dx+c)^4}+6\,b^3e^{\left(\frac{e}{dx+c}+5\right)}-\frac{24\,b^3ce^{\left(\frac{e}{dx+c}+5\right)}}{dx+c}+\frac{36\,b^3c^2e^{\left(\frac{e}{dx+c}+5\right)}}{(dx+c)^2}-\frac{24\,b^3c^3e^{\left(\frac{e}{dx+c}+5\right)}}{(dx+c)^3}+\frac{24\,ab^2de^{\left(\frac{e}{dx+c}+5\right)}}{dx+c}-\frac{72\,ab^2cde^{\left(\frac{e}{dx+c}+5\right)}}{(dx+c)^2}+\frac{72\,ab^2c^2de^{\left(\frac{e}{dx+c}+5\right)}}{(dx+c)^3}+\frac{36\,a^2bd^2e^{\left(\frac{e}{dx+c}+5\right)}}{(dx+c)^2}-\frac{72\,a^2bcd^2e^{\left(\frac{e}{dx+c}+5\right)}}{(dx+c)^3}+\frac{24\,a^3d^3e^{\left(\frac{e}{dx+c}+5\right)}}{(dx+c)^3}-\frac{36\,b^3c^2\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^7}{(dx+c)^4}+\frac{72\,ab^2cd\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^7}{(dx+c)^4}-\frac{36\,a^2bd^2\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^7}{(dx+c)^4}+\frac{2\,b^3e^{\left(\frac{e}{dx+c}+6\right)}}{dx+c}-\frac{12\,b^3ce^{\left(\frac{e}{dx+c}+6\right)}}{(dx+c)^2}+\frac{36\,b^3c^2e^{\left(\frac{e}{dx+c}+6\right)}}{(dx+c)^3}+\frac{12\,ab^2de^{\left(\frac{e}{dx+c}+6\right)}}{(dx+c)^2}-\frac{72\,ab^2cde^{\left(\frac{e}{dx+c}+6\right)}}{(dx+c)^3}+\frac{36\,a^2bd^2e^{\left(\frac{e}{dx+c}+6\right)}}{(dx+c)^3}+\frac{12\,b^3c\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^8}{(dx+c)^4}-\frac{12\,ab^2d\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^8}{(dx+c)^4}+\frac{b^3e^{\left(\frac{e}{dx+c}+7\right)}}{(dx+c)^2}-\frac{12\,b^3ce^{\left(\frac{e}{dx+c}+7\right)}}{(dx+c)^3}+\frac{12\,ab^2de^{\left(\frac{e}{dx+c}+7\right)}}{(dx+c)^3}-\frac{b^3\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^9}{(dx+c)^4}+\frac{b^3e^{\left(\frac{e}{dx+c}+8\right)}}{(dx+c)^3}\right)(dx+c)^4e^{(-5)}}{24\,d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a)^3,x, algorithm="giac")
```

```
[Out] 1/24*(24*b^3*c^3*Ei(e/(d*x + c))*e^6/(d*x + c)^4 - 72*a*b^2*c^2*d*Ei(e/(d*x
 + c))*e^6/(d*x + c)^4 + 72*a^2*b*c*d^2*Ei(e/(d*x + c))*e^6/(d*x + c)^4 - 2
4*a^3*d^3*Ei(e/(d*x + c))*e^6/(d*x + c)^4 + 6*b^3*e^(e/(d*x + c) + 5) - 24*
b^3*c*e^(e/(d*x + c) + 5)/(d*x + c) + 36*b^3*c^2*e^(e/(d*x + c) + 5)/(d*x +
 c)^2 - 24*b^3*c^3*e^(e/(d*x + c) + 5)/(d*x + c)^3 + 24*a*b^2*d*e^(e/(d*x +
 c) + 5)/(d*x + c) - 72*a*b^2*c*d*e^(e/(d*x + c) + 5)/(d*x + c)^2 + 72*a*b^
```

```
2*c^2*d*e^(e/(d*x + c) + 5)/(d*x + c)^3 + 36*a^2*b*d^2*e^(e/(d*x + c) + 5)/
(d*x + c)^2 - 72*a^2*b*c*d^2*e^(e/(d*x + c) + 5)/(d*x + c)^3 + 24*a^3*d^3*e
^(e/(d*x + c) + 5)/(d*x + c)^3 - 36*b^3*c^2*Ei(e/(d*x + c))*e^7/(d*x + c)^4
 + 72*a*b^2*c*d*Ei(e/(d*x + c))*e^7/(d*x + c)^4 - 36*a^2*b*d^2*Ei(e/(d*x +
c))*e^7/(d*x + c)^4 + 2*b^3*e^(e/(d*x + c) + 6)/(d*x + c) - 12*b^3*c*e^(e/(
d*x + c) + 6)/(d*x + c)^2 + 36*b^3*c^2*e^(e/(d*x + c) + 6)/(d*x + c)^3 + 12
*a*b^2*d*e^(e/(d*x + c) + 6)/(d*x + c)^2 - 72*a*b^2*c*d*e^(e/(d*x + c) + 6)
/(d*x + c)^3 + 36*a^2*b*d^2*e^(e/(d*x + c) + 6)/(d*x + c)^3 + 12*b^3*c*Ei(e
/(d*x + c))*e^8/(d*x + c)^4 - 12*a*b^2*d*Ei(e/(d*x + c))*e^8/(d*x + c)^4 +
b^3*e^(e/(d*x + c) + 7)/(d*x + c)^2 - 12*b^3*c*e^(e/(d*x + c) + 7)/(d*x + c
)^3 + 12*a*b^2*d*e^(e/(d*x + c) + 7)/(d*x + c)^3 - b^3*Ei(e/(d*x + c))*e^9/
(d*x + c)^4 + b^3*e^(e/(d*x + c) + 8)/(d*x + c)^3)*(d*x + c)^4*e^(-5)/d^4
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int e^{\frac{e}{c+d\,x}}\,{\left(a+b\,x\right)}^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x))*(a + b*x)^3,x)
[Out] int(exp(e/(c + d*x))*(a + b*x)^3, x)
```

3.403 $\int e^{\frac{e}{c+dx}}(a+bx)^2\,dx$

Optimal. Leaf size=255

$$\frac{(bc-ad)^2e^{\frac{e}{c+dx}}(c+dx)}{d^3}-\frac{b(bc-ad)ee^{\frac{e}{c+dx}}(c+dx)}{d^3}+\frac{b^2e^2e^{\frac{e}{c+dx}}(c+dx)}{6d^3}-\frac{b(bc-ad)e^{\frac{e}{c+dx}}(c+dx)^2}{d^3}+\frac{b^2ee^{\frac{e}{c+dx}}}{}$$

```
[Out] (-a*d+b*c)^2*exp(e/(d*x+c))*(d*x+c)/d^3-b*(-a*d+b*c)*e*exp(e/(d*x+c))*(d*x+
c)/d^3+1/6*b^2*e^2*exp(e/(d*x+c))*(d*x+c)/d^3-b*(-a*d+b*c)*exp(e/(d*x+c))*(
d*x+c)^2/d^3+1/6*b^2*e*exp(e/(d*x+c))*(d*x+c)^2/d^3+1/3*b^2*exp(e/(d*x+c))*
(d*x+c)^3/d^3-(-a*d+b*c)^2*e*Ei(e/(d*x+c))/d^3+b*(-a*d+b*c)*e^2*Ei(e/(d*x+c
))/d^3-1/6*b^2*e^3*Ei(e/(d*x+c))/d^3
```

Rubi [A]

time = 0.18, antiderivative size = 255, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.210$, Rules used = {2258, 2237, 2241, 2245}

$$\frac{be^2(bc-ad)\text{Ei}\left(\frac{e}{c+dx}\right)}{d^3}-\frac{e(bc-ad)^2\text{Ei}\left(\frac{e}{c+dx}\right)}{d^3}-\frac{be(c+dx)(bc-ad)e^{\frac{e}{c+dx}}}{d^3}-\frac{b(c+dx)^2(bc-ad)e^{\frac{e}{c+dx}}}{d^3}+\frac{(c+dx)(bc-ad)^2e^{\frac{e}{c+dx}}}{d^3}-\frac{b^2e^3\text{Ei}\left(\frac{e}{c+dx}\right)}{6d^3}+\frac{b^2e^2(c+dx)e^{\frac{e}{c+dx}}}{6d^3}+\frac{b^2e(c+dx)^2e^{\frac{e}{c+dx}}}{6d^3}+\frac{b^2(c+dx)^3e^{\frac{e}{c+dx}}}{3d^3}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x))*(a + b*x)^2,x]
```

```
[Out] ((b*c - a*d)^2*E^(e/(c + d*x))*(c + d*x))/d^3 - (b*(b*c - a*d)*e*E^(e/(c +
d*x))*(c + d*x))/d^3 + (b^2*e^2*E^(e/(c + d*x))*(c + d*x))/(6*d^3) - (b*(b*
c - a*d)*E^(e/(c + d*x))*(c + d*x)^2)/d^3 + (b^2*e*E^(e/(c + d*x))*(c + d*x
)^2)/(6*d^3) + (b^2*E^(e/(c + d*x))*(c + d*x)^3)/(3*d^3) - ((b*c - a*d)^2*e
*ExpIntegralEi[e/(c + d*x)])/d^3 + (b*(b*c - a*d)*e^2*ExpIntegralEi[e/(c +
d*x)])/d^3 - (b^2*e^3*ExpIntegralEi[e/(c + d*x)])/(6*d^3)
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
```

```
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\begin{aligned}
\int e^{\frac{e}{c+dx}}(a+bx)^2\,dx &= \int\left(\frac{(-bc+ad)^2e^{\frac{e}{c+dx}}}{d^2}-\frac{2b(bc-ad)e^{\frac{e}{c+dx}}(c+dx)}{d^2}+\frac{b^2e^{\frac{e}{c+dx}}(c+dx)^2}{d^2}\right)dx\\
&= \frac{b^2\int e^{\frac{e}{c+dx}}(c+dx)^2\,dx}{d^2}-\frac{(2b(bc-ad))\int e^{\frac{e}{c+dx}}(c+dx)\,dx}{d^2}+\frac{(bc-ad)^2\int e^{\frac{e}{c+dx}}\,dx}{d^2}\\
&= \frac{(bc-ad)^2e^{\frac{e}{c+dx}}(c+dx)}{d^3}-\frac{b(bc-ad)e^{\frac{e}{c+dx}}(c+dx)^2}{d^3}+\frac{b^2e^{\frac{e}{c+dx}}(c+dx)^3}{3d^3}+\frac{(b^2e)\int e^{\frac{e}{c+}}
\end{aligned}$$

$$\begin{aligned}
&= \frac{(bc-ad)^2e^{\frac{e}{c+dx}}(c+dx)}{d^3}-\frac{b(bc-ad)ee^{\frac{e}{c+dx}}(c+dx)}{d^3}-\frac{b(bc-ad)e^{\frac{e}{c+dx}}(c+dx)^2}{d^3}+\frac{b^2}{}\\
&= \frac{(bc-ad)^2e^{\frac{e}{c+dx}}(c+dx)}{d^3}-\frac{b(bc-ad)ee^{\frac{e}{c+dx}}(c+dx)}{d^3}+\frac{b^2e^2e^{\frac{e}{c+dx}}(c+dx)}{6d^3}-\frac{b(bc-ad}{}\\
&= \frac{(bc-ad)^2e^{\frac{e}{c+dx}}(c+dx)}{d^3}-\frac{b(bc-ad)ee^{\frac{e}{c+dx}}(c+dx)}{d^3}+\frac{b^2e^2e^{\frac{e}{c+dx}}(c+dx)}{6d^3}-\frac{b(bc-ad}{}
\end{aligned}$$

Mathematica [A]
time = 0.15, size = 170, normalized size = 0.67

$$\frac{c(6a^2d^2+6abd(-c+e)+b^2(2c^2-5ce+e^2))\,e^{\frac{e}{c+dx}}}{6d^3}+\frac{de^{\frac{e}{c+dx}}x(6a^2d^2+6abd(e+dx)+b^2(-4ce+e^2+dex+2d^2x^2))-e(6a^2d^2+6abd(-2c+e)+b^2(6c^2-6ce+e^2))\,\mathrm{Ei}\left(\frac{e}{c+dx}\right)}{6d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x))*(a + b*x)^2,x]
```

```
[Out] (c*(6*a^2*d^2 + 6*a*b*d*(-c + e) + b^2*(2*c^2 - 5*c*e + e^2))*E^(e/(c + d*x
)))/(6*d^3) + (d*E^(e/(c + d*x))*x*(6*a^2*d^2 + 6*a*b*d*(e + d*x) + b^2*(-4
*c*e + e^2 + d*e*x + 2*d^2*x^2)) - e*(6*a^2*d^2 + 6*a*b*d*(-2*c + e) + b^2*
(6*c^2 - 6*c*e + e^2))*ExpIntegralEi[e/(c + d*x)])/(6*d^3)
```

Maple [A]
time = 0.07, size = 356, normalized size = 1.40

method	result
derivativedivides	$-\frac{e\left(a^2\left(-\frac{(dx+c)\,\mathrm{e}^{\frac{e}{dx+c}}}{e}-\mathrm{expIntegral}\left(1,-\frac{e}{dx+c}\right)\right)+\frac{b^2e^2\left(-\frac{(dx+c)^3\mathrm{e}^{\frac{e}{dx+c}}}{3e^3}-\frac{\mathrm{e}^{\frac{e}{dx+c}}(dx+c)^2}{6e^2}-\frac{(dx+c)\mathrm{e}^{\frac{e}{dx+c}}}{6e}-\frac{\mathrm{expIntegra}}{}\right.}{d^2}\right.}{}$
default	$-\frac{e\left(a^2\left(-\frac{(dx+c)\,\mathrm{e}^{\frac{e}{dx+c}}}{e}-\mathrm{expIntegral}\left(1,-\frac{e}{dx+c}\right)\right)+\frac{b^2e^2\left(-\frac{(dx+c)^3\mathrm{e}^{\frac{e}{dx+c}}}{3e^3}-\frac{\mathrm{e}^{\frac{e}{dx+c}}(dx+c)^2}{6e^2}-\frac{(dx+c)\mathrm{e}^{\frac{e}{dx+c}}}{6e}-\frac{\mathrm{expIntegra}}{}\right.}{d^2}\right.}{}$
risch	$\frac{e\,b^2c^2\,\mathrm{expIntegral}\left(1,-\frac{e}{dx+c}\right)}{d^3}+\frac{eab\,\mathrm{e}^{\frac{e}{dx+c}}x}{d}-\frac{e^2c\,b^2\,\mathrm{expIntegral}\left(1,-\frac{e}{dx+c}\right)}{d^3}-\frac{2eabc\,\mathrm{expIntegral}\left(1,-\frac{e}{dx+c}\right)}{d^2}+$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(d*x+c))*(b*x+a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/d*e*(a^2*(-(d*x+c)/e*exp(e/(d*x+c))-Ei(1,-e/(d*x+c)))+b^2/d^2*e^2*(-1/3*
(d*x+c)^3/e^3*exp(e/(d*x+c))-1/6*exp(e/(d*x+c))*(d*x+c)^2/e^2-1/6*(d*x+c)/e
*exp(e/(d*x+c))-1/6*Ei(1,-e/(d*x+c)))+b^2/d^2*c^2*(-(d*x+c)/e*exp(e/(d*x+c)
)-Ei(1,-e/(d*x+c)))+2*b/d*e*a*(-1/2*exp(e/(d*x+c))*(d*x+c)^2/e^2-1/2*(d*x+c
)/e*exp(e/(d*x+c))-1/2*Ei(1,-e/(d*x+c)))-2*b^2/d^2*e*c*(-1/2*exp(e/(d*x+c))
*(d*x+c)^2/e^2-1/2*(d*x+c)/e*exp(e/(d*x+c))-1/2*Ei(1,-e/(d*x+c)))-2*b/d*c*a
*(-(d*x+c)/e*exp(e/(d*x+c))-Ei(1,-e/(d*x+c))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a)^2,x, algorithm="maxima")
```

```
[Out] 1/6*(2*b^2*d^2*x^3 + (6*a*b*d^2 + b^2*d*e)*x^2 + (6*a^2*d^2 + 6*a*b*d*e - (
4*c*e - e^2)*b^2)*x)*e^(e/(d*x + c))/d^2 + integrate(-1/6*(6*a*b*c^2*d*e -
(4*c^3*e - c^2*e^2)*b^2 - (6*a^2*d^3*e - 6*(2*c*d^2*e - d^2*e^2)*a*b + (6*c
^2*d*e - 6*c*d*e^2 + d*e^3)*b^2)*x)*e^(e/(d*x + c))/(d^4*x^2 + 2*c*d^3*x +
c^2*d^2), x)
```

Fricas [A]
time = 0.38, size = 195, normalized size = 0.76

$$-\frac{(b^2e^3-6\,(b^2c-abd)e^2+6\,(b^2c^2-2\,abcd+a^2d^2)e)\mathrm{Ei}\left(\frac{e}{dx+c}\right)-(2\,b^2d^3x^3+6\,abd^3x^2+6\,a^2d^3x+2\,b^2c^3-6\,abc^2d+6\,a^2cd^2+(b^2dx+b^2c)e^2+(b^2d^2x^2-5\,b^2c^2+6\,abcd-2\,(2\,b^2cd-3\,abd^2)x)e)e^{\left(\frac{e}{dx+c}\right)}}{6\,d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a)^2,x, algorithm="fricas")
```

```
[Out] -1/6*((b^2*e^3 - 6*(b^2*c - a*b*d)*e^2 + 6*(b^2*c^2 - 2*a*b*c*d + a^2*d^2)*
e)*Ei(e/(d*x + c)) - (2*b^2*d^3*x^3 + 6*a*b*d^3*x^2 + 6*a^2*d^3*x + 2*b^2*c
^3 - 6*a*b*c^2*d + 6*a^2*c*d^2 + (b^2*d*x + b^2*c)*e^2 + (b^2*d^2*x^2 - 5*b
^2*c^2 + 6*a*b*c*d - 2*(2*b^2*c*d - 3*a*b*d^2)*x)*e)*e^(e/(d*x + c)))/d^3
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int (a+bx)^2 e^{\frac{e}{c+dx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a)**2,x)
```

```
[Out] Integral((a + b*x)**2*exp(e/(c + d*x)), x)
```

Giac [A]
time = 2.29, size = 424, normalized size = 1.66

$$-\frac{\left(\frac{6\,b^2c^2\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^5}{(dx+c)^3}-\frac{12\,abcd\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^5}{(dx+c)^3}+\frac{6\,a^2d^2\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^5}{(dx+c)^3}-2\,b^2e^{\left(\frac{e}{dx+c}+4\right)}+\frac{6\,b^2ce^{\left(\frac{e}{dx+c}+4\right)}}{dx+c}-\frac{6\,b^2c^2e^{\left(\frac{e}{dx+c}+4\right)}}{(dx+c)^2}-\frac{6\,abde^{\left(\frac{e}{dx+c}+4\right)}}{dx+c}+\frac{12\,abcde^{\left(\frac{e}{dx+c}+4\right)}}{(dx+c)^2}-\frac{6\,a^2d^2e^{\left(\frac{e}{dx+c}+4\right)}}{(dx+c)^2}-\frac{6\,b^2c\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^6}{(dx+c)^3}+\frac{6\,abd\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^6}{(dx+c)^3}-\frac{b^2e^{\left(\frac{e}{dx+c}+5\right)}}{dx+c}+\frac{6\,b^2ce^{\left(\frac{e}{dx+c}+5\right)}}{(dx+c)^2}-\frac{6\,abde^{\left(\frac{e}{dx+c}+5\right)}}{(dx+c)^2}+\frac{b^2\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^7}{(dx+c)^3}-\frac{b^2e^{\left(\frac{e}{dx+c}+6\right)}}{(dx+c)^2}\right)(dx+c)^3e^{(-4)}}{6\,d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a)^2,x, algorithm="giac")
```

```
[Out] -1/6*(6*b^2*c^2*Ei(e/(d*x + c))*e^5/(d*x + c)^3 - 12*a*b*c*d*Ei(e/(d*x + c)
)*e^5/(d*x + c)^3 + 6*a^2*d^2*Ei(e/(d*x + c))*e^5/(d*x + c)^3 - 2*b^2*e^(e/
(d*x + c) + 4) + 6*b^2*c*e^(e/(d*x + c) + 4)/(d*x + c) - 6*b^2*c^2*e^(e/(d*
x + c) + 4)/(d*x + c)^2 - 6*a*b*d*e^(e/(d*x + c) + 4)/(d*x + c) + 12*a*b*c*
d*e^(e/(d*x + c) + 4)/(d*x + c)^2 - 6*a^2*d^2*e^(e/(d*x + c) + 4)/(d*x + c)
^2 - 6*b^2*c*Ei(e/(d*x + c))*e^6/(d*x + c)^3 + 6*a*b*d*Ei(e/(d*x + c))*e^6/
(d*x + c)^3 - b^2*e^(e/(d*x + c) + 5)/(d*x + c) + 6*b^2*c*e^(e/(d*x + c) +
5)/(d*x + c)^2 - 6*a*b*d*e^(e/(d*x + c) + 5)/(d*x + c)^2 + b^2*Ei(e/(d*x +
c))*e^7/(d*x + c)^3 - b^2*e^(e/(d*x + c) + 6)/(d*x + c)^2)*(d*x + c)^3*e^(-
4)/d^3
```

Mupad [B]
time = 4.10, size = 306, normalized size = 1.20

$$\frac{x\,\mathrm{e}^{\frac{e}{c+d\,x}}\,\left(2\,a^2\,c+\frac{\frac{b^2\,c^3}{3}-d\,\left(a\,b\,c^2-2\,a\,b\,c\,e\right)+\frac{b^2\,c\,e^2}{3}-\frac{3\,b^2\,c^2\,e}{2}}{d^2}\right)+\frac{\mathrm{e}^{\frac{e}{c+d\,x}}\,\left(\frac{b^2\,c^4}{3}-d\,\left(a\,b\,c^3-a\,b\,c^2\,e\right)-\frac{5\,b^2\,c^3\,e}{6}+a^2\,c^2\,d^2+\frac{b^2\,c^2\,e^2}{6}\right)}{d^3}+x^2\,\mathrm{e}^{\frac{e}{c+d\,x}}\,\left(\frac{\frac{b^2\,e^2}{6}-\frac{b^2\,c\,e}{2}}{d}+a^2\,d+a\,b\,c+a\,b\,e\right)+\frac{b^2\,d\,x^4\,\mathrm{e}^{\frac{e}{c+d\,x}}}{3}+\frac{b\,x^3\,\mathrm{e}^{\frac{e}{c+d\,x}}\,\left(6\,a\,d+2\,b\,c+b\,e\right)}{6}}{c+d\,x}-\frac{\mathrm{ei}\left(\frac{e}{c+d\,x}\right)\,\left(\frac{b^2\,e^3}{6}+d\,\left(a\,b\,e^2-2\,a\,b\,c\,e\right)+a^2\,d^2\,e-b^2\,c\,e^2+b^2\,c^2\,e\right)}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x))*(a + b*x)^2,x)
```

```
[Out] (x*exp(e/(c + d*x))*(2*a^2*c + ((b^2*c^3)/3 - d*(a*b*c^2 - 2*a*b*c*e) + (b^
2*c*e^2)/3 - (3*b^2*c^2*e)/2)/d^2) + (exp(e/(c + d*x))*((b^2*c^4)/3 - d*(a*
b*c^3 - a*b*c^2*e) - (5*b^2*c^3*e)/6 + a^2*c^2*d^2 + (b^2*c^2*e^2)/6))/d^3
+ x^2*exp(e/(c + d*x))*(((b^2*e^2)/6 - (b^2*c*e)/2)/d + a^2*d + a*b*c + a*b
*e) + (b^2*d*x^4*exp(e/(c + d*x)))/3 + (b*x^3*exp(e/(c + d*x))*(6*a*d + 2*b
*c + b*e))/6)/(c + d*x) - (ei(e/(c + d*x))*((b^2*e^3)/6 + d*(a*b*e^2 - 2*a*
b*c*e) + a^2*d^2*e - b^2*c*e^2 + b^2*c^2*e))/d^3
```

3.404 $\int e^{\frac{e}{c+dx}}(a+bx)\,dx$

Optimal. Leaf size=125

$$-\frac{(bc-ad)e^{\frac{e}{c+dx}}(c+dx)}{d^2}+\frac{bee^{\frac{e}{c+dx}}(c+dx)}{2d^2}+\frac{be^{\frac{e}{c+dx}}(c+dx)^2}{2d^2}+\frac{(bc-ad)e\mathrm{Ei}\left(\frac{e}{c+dx}\right)}{d^2}-\frac{be^2\mathrm{Ei}\left(\frac{e}{c+dx}\right)}{2d^2}$$

```
[Out] -(-a*d+b*c)*exp(e/(d*x+c))*(d*x+c)/d^2+1/2*b*e*exp(e/(d*x+c))*(d*x+c)/d^2+1
/2*b*exp(e/(d*x+c))*(d*x+c)^2/d^2+(-a*d+b*c)*e*Ei(e/(d*x+c))/d^2-1/2*b*e^2*
Ei(e/(d*x+c))/d^2
```

Rubi [A]
time = 0.09, antiderivative size = 125, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.235$, Rules used = {2258, 2237, 2241, 2245}

$$\frac{e(bc-ad)\mathrm{Ei}\left(\frac{e}{c+dx}\right)}{d^2}-\frac{(c+dx)(bc-ad)e^{\frac{e}{c+dx}}}{d^2}-\frac{be^2\mathrm{Ei}\left(\frac{e}{c+dx}\right)}{2d^2}+\frac{be(c+dx)e^{\frac{e}{c+dx}}}{2d^2}+\frac{b(c+dx)^2e^{\frac{e}{c+dx}}}{2d^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x))*(a + b*x),x]
```

```
[Out] -(((b*c - a*d)*E^(e/(c + d*x))*(c + d*x))/d^2) + (b*e*E^(e/(c + d*x))*(c +
d*x))/(2*d^2) + (b*E^(e/(c + d*x))*(c + d*x)^2)/(2*d^2) + ((b*c - a*d)*e*Ex
pIntegralEi[e/(c + d*x)])/d^2 - (b*e^2*ExpIntegralEi[e/(c + d*x)])/(2*d^2)
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
```

```
] && LeQ[-n, m + 1]))
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\begin{aligned}\int e^{\frac{e}{c+dx}}(a+bx)\,dx &= \int \left(\frac{(-bc+ad)e^{\frac{e}{c+dx}}}{d}+\frac{be^{\frac{e}{c+dx}}(c+dx)}{d}\right)dx\\ &= \frac{b\int e^{\frac{e}{c+dx}}(c+dx)\,dx}{d}+\frac{(-bc+ad)\int e^{\frac{e}{c+dx}}\,dx}{d}\\ &= -\frac{(bc-ad)e^{\frac{e}{c+dx}}(c+dx)}{d^2}+\frac{be^{\frac{e}{c+dx}}(c+dx)^2}{2d^2}+\frac{(be)\int e^{\frac{e}{c+dx}}\,dx}{2d}+\frac{((-bc+ad)e)\int \frac{e^{\frac{e}{c+dx}}}{c+dx}}{d}\\ &= -\frac{(bc-ad)e^{\frac{e}{c+dx}}(c+dx)}{d^2}+\frac{bee^{\frac{e}{c+dx}}(c+dx)}{2d^2}+\frac{be^{\frac{e}{c+dx}}(c+dx)^2}{2d^2}+\frac{(bc-ad)e\mathrm{Ei}\left(\frac{e}{c+dx}\right)}{d^2}\\ &= -\frac{(bc-ad)e^{\frac{e}{c+dx}}(c+dx)}{d^2}+\frac{bee^{\frac{e}{c+dx}}(c+dx)}{2d^2}+\frac{be^{\frac{e}{c+dx}}(c+dx)^2}{2d^2}+\frac{(bc-ad)e\mathrm{Ei}\left(\frac{e}{c+dx}\right)}{d^2}\end{aligned}$$

Mathematica [A]
time = 0.07, size = 91, normalized size = 0.73

$$\frac{c(2ad+b(-c+e))e^{\frac{e}{c+dx}}}{2d^2}+\frac{de^{\frac{e}{c+dx}}x(2ad+b(e+dx))-e(2ad+b(-2c+e))\mathrm{Ei}\left(\frac{e}{c+dx}\right)}{2d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x))*(a + b*x),x]
```

```
[Out] (c*(2*a*d + b*(-c + e))*E^(e/(c + d*x)))/(2*d^2) + (d*E^(e/(c + d*x))*x*(2*
a*d + b*(e + d*x)) - e*(2*a*d + b*(-2*c + e))*ExpIntegralEi[e/(c + d*x)])/(
2*d^2)
```

Maple [A]
time = 0.02, size = 150, normalized size = 1.20

method	result

derivativedivides	$-\frac{e\left(a\left(-\frac{(dx+c)e^{\frac{e}{dx+c}}}{e}-\text{expIntegral}\left(1,-\frac{e}{dx+c}\right)\right)+\frac{be\left(-\frac{e^{\frac{e}{dx+c}}(dx+c)^2}{2e^2}-\frac{(dx+c)e^{\frac{e}{dx+c}}}{2e}-\frac{\text{expIntegral}\left(1,-\frac{e}{dx+c}\right)}{2}\right)}{d}-\frac{bc(}{}\right.}{d}$
default	$-\frac{e\left(a\left(-\frac{(dx+c)e^{\frac{e}{dx+c}}}{e}-\text{expIntegral}\left(1,-\frac{e}{dx+c}\right)\right)+\frac{be\left(-\frac{e^{\frac{e}{dx+c}}(dx+c)^2}{2e^2}-\frac{(dx+c)e^{\frac{e}{dx+c}}}{2e}-\frac{\text{expIntegral}\left(1,-\frac{e}{dx+c}\right)}{2}\right)}{d}-\frac{bc(}{}\right.}{d}$
risch	$a\,e^{\frac{e}{dx+c}}x+\frac{a\,e^{\frac{e}{dx+c}}c}{d}+\frac{ea\,\text{expIntegral}\left(1,-\frac{e}{dx+c}\right)}{d}+\frac{b\,e^{\frac{e}{dx+c}}x^2}{2}-\frac{b\,e^{\frac{e}{dx+c}}c^2}{2d^2}+\frac{eb\,e^{\frac{e}{dx+c}}x}{2d}+\frac{eb\,e^{\frac{e}{dx+c}}c}{2d^2}+$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(d*x+c))*(b*x+a),x,method=_RETURNVERBOSE)
```

```
[Out] -1/d*e*(a*(-(d*x+c)/e*exp(e/(d*x+c))-Ei(1,-e/(d*x+c)))+b/d*e*(-1/2*exp(e/(d
*x+c))*(d*x+c)^2/e^2-1/2*(d*x+c)/e*exp(e/(d*x+c))-1/2*Ei(1,-e/(d*x+c)))-b/d
*c*(-(d*x+c)/e*exp(e/(d*x+c))-Ei(1,-e/(d*x+c))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a),x, algorithm="maxima")
```

```
[Out] 1/2*(b*d*x^2 + (2*a*d + b*e)*x)*e^(e/(d*x + c))/d + integrate(-1/2*(b*c^2*e
 - (2*a*d^2*e - (2*c*d*e - d*e^2)*b)*x)*e^(e/(d*x + c))/(d^3*x^2 + 2*c*d^2*
x + c^2*d), x)
```

Fricas [A]
time = 0.35, size = 86, normalized size = 0.69

$$-\frac{(be^2-2(bc-ad)e)\text{Ei}\left(\frac{e}{dx+c}\right)-(bd^2x^2+2ad^2x-bc^2+2acd+(bdx+bc)e)e^{\left(\frac{e}{dx+c}\right)}}{2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a),x, algorithm="fricas")
```

```
[Out] -1/2*((b*e^2 - 2*(b*c - a*d)*e)*Ei(e/(d*x + c)) - (b*d^2*x^2 + 2*a*d^2*x -
b*c^2 + 2*a*c*d + (b*d*x + b*c)*e)*e^(e/(d*x + c)))/d^2
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int (a+bx)\,e^{\frac{e}{c+dx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a),x)
```

```
[Out] Integral((a + b*x)*exp(e/(c + d*x)), x)
```

Giac [A]
time = 2.41, size = 171, normalized size = 1.37

$$\frac{(dx+c)^2\left(\frac{2\,bc\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^4}{(dx+c)^2}-\frac{2\,ad\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^4}{(dx+c)^2}+be^{\left(\frac{e}{dx+c}+3\right)}-\frac{2\,bce^{\left(\frac{e}{dx+c}+3\right)}}{dx+c}+\frac{2\,ade^{\left(\frac{e}{dx+c}+3\right)}}{dx+c}-\frac{b\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^5}{(dx+c)^2}+\frac{be^{\left(\frac{e}{dx+c}+4\right)}}{dx+c}\right)e^{(-3)}}{2\,d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a),x, algorithm="giac")
```

```
[Out] 1/2*(d*x + c)^2*(2*b*c*Ei(e/(d*x + c))*e^4/(d*x + c)^2 - 2*a*d*Ei(e/(d*x +
c))*e^4/(d*x + c)^2 + b*e^(e/(d*x + c) + 3) - 2*b*c*e^(e/(d*x + c) + 3)/(d*
x + c) + 2*a*d*e^(e/(d*x + c) + 3)/(d*x + c) - b*Ei(e/(d*x + c))*e^5/(d*x +
 c)^2 + b*e^(e/(d*x + c) + 4)/(d*x + c))*e^(-3)/d^2
```

Mupad [B]
time = 3.67, size = 153, normalized size = 1.22

$$\frac{\frac{\mathrm{e}^{\frac{e}{c+d\,x}}\,\left(2\,a\,c^2\,d-b\,c^3+b\,c^2\,e\right)}{2\,d^2}+x\,\mathrm{e}^{\frac{e}{c+d\,x}}\,\left(2\,a\,c-\frac{\frac{b\,c^2}{2}-b\,c\,e}{d}\right)+x^2\,\mathrm{e}^{\frac{e}{c+d\,x}}\,\left(a\,d+\frac{b\,c}{2}+\frac{b\,e}{2}\right)+\frac{b\,d\,x^3\,\mathrm{e}^{\frac{e}{c+d\,x}}}{2}}{c+d\,x}-\frac{\mathrm{ei}\left(\frac{e}{c+d\,x}\right)\,\left(b\,e^2+2\,a\,d\,e-2\,b\,c\,e\right)}{2\,d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x))*(a + b*x),x)
```

```
[Out] ((exp(e/(c + d*x))*(2*a*c^2*d - b*c^3 + b*c^2*e))/(2*d^2) + x*exp(e/(c + d*
x))*(2*a*c - ((b*c^2)/2 - b*c*e)/d) + x^2*exp(e/(c + d*x))*(a*d + (b*c)/2 +
 (b*e)/2) + (b*d*x^3*exp(e/(c + d*x)))/2)/(c + d*x) - (ei(e/(c + d*x))*(b*e
^2 + 2*a*d*e - 2*b*c*e))/(2*d^2)
```

3.405 $\int e^{\frac{e}{c+dx}} \, dx$

Optimal. Leaf size=37

$$\frac{e^{\frac{e}{c+dx}}(c+dx)}{d}-\frac{e\text{Ei}\left(\frac{e}{c+dx}\right)}{d}$$

```
[Out] exp(e/(d*x+c))*(d*x+c)/d-e*Ei(e/(d*x+c))/d
```

Rubi [A]
time = 0.02, antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {2237, 2241}

$$\frac{(c+dx)e^{\frac{e}{c+dx}}}{d}-\frac{e\text{Ei}\left(\frac{e}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x)),x]
```

```
[Out] (E^(e/(c + d*x))*(c + d*x))/d - (e*ExpIntegralEi[e/(c + d*x)])/d
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\begin{aligned}\int e^{\frac{e}{c+dx}} \, dx &= \frac{e^{\frac{e}{c+dx}}(c+dx)}{d}+e\int \frac{e^{\frac{e}{c+dx}}}{c+dx} \, dx\\ &= \frac{e^{\frac{e}{c+dx}}(c+dx)}{d}-\frac{e\text{Ei}\left(\frac{e}{c+dx}\right)}{d}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 37, normalized size = 1.00

$$\frac{e^{\frac{e}{c+dx}}(c+dx)}{d}-\frac{e\text{Ei}\left(\frac{e}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x)),x]
[Out] (E^(e/(c + d*x))*(c + d*x))/d - (e*ExpIntegralEi[e/(c + d*x)])/d
```

Maple [A]
time = 0.01, size = 42, normalized size = 1.14

method	result	size
derivativedivides	$-\frac{e\left(-\frac{(dx+c)\,\mathrm{e}^{\frac{e}{dx+c}}}{e}-\mathrm{expIntegral}\left(1,-\frac{e}{dx+c}\right)\right)}{d}$	42
default	$-\frac{e\left(-\frac{(dx+c)\,\mathrm{e}^{\frac{e}{dx+c}}}{e}-\mathrm{expIntegral}\left(1,-\frac{e}{dx+c}\right)\right)}{d}$	42
risch	$\mathrm{e}^{\frac{e}{dx+c}}x+\frac{\mathrm{e}^{\frac{e}{dx+c}}c}{d}+\frac{e\,\mathrm{expIntegral}\left(1,-\frac{e}{dx+c}\right)}{d}$	46

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(d*x+c)),x,method=_RETURNVERBOSE)
[Out] -1/d*e*(-(d*x+c)/e*exp(e/(d*x+c))-Ei(1,-e/(d*x+c)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)),x, algorithm="maxima")
[Out] d*e*integrate(x*e^(e/(d*x + c))/(d^2*x^2 + 2*c*d*x + c^2), x) + x*e^(e/(d*x
 + c))
```

Fricas [A]
time = 0.35, size = 38, normalized size = 1.03

$$-\frac{\mathrm{Ei}\left(\frac{e}{dx+c}\right)e-(dx+c)e^{\left(\frac{e}{dx+c}\right)}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)),x, algorithm="fricas")
[Out] -(Ei(e/(d*x + c))*e - (d*x + c)*e^(e/(d*x + c)))/d
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int e^{\frac{e}{c+dx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)),x)
[Out] Integral(exp(e/(c + d*x)), x)
```

Giac [A]
time = 2.47, size = 49, normalized size = 1.32

$$-\frac{(dx+c)\left(\frac{\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^3}{dx+c}-e^{\left(\frac{e}{dx+c}+2\right)}\right)e^{(-2)}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)),x, algorithm="giac")
[Out] -(d*x + c)*(Ei(e/(d*x + c))*e^3/(d*x + c) - e^(e/(d*x + c) + 2))*e^(-2)/d
```

Mupad [B]
time = 3.62, size = 44, normalized size = 1.19

$$x\,\mathrm{e}^{\frac{e}{c+d\,x}}-\frac{e\,\mathrm{ei}\left(\frac{e}{c+d\,x}\right)-c\,\mathrm{e}^{\frac{e}{c+d\,x}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)),x)
[Out] x*exp(e/(c + d*x)) - (e*ei(e/(c + d*x)) - c*exp(e/(c + d*x)))/d
```

3.406 $\int \frac{e^{\frac{e}{c+dx}}}{a+bx} \, dx$

Optimal. Leaf size=62

$$-\frac{\text{Ei}\left(\frac{e}{c+dx}\right)}{b}+\frac{e^{\frac{be}{bc-ad}}\text{Ei}\left(-\frac{de(a+bx)}{(bc-ad)(c+dx)}\right)}{b}$$

```
[Out] -Ei(e/(d*x+c))/b+exp(b*e/(-a*d+b*c))*Ei(-d*e*(b*x+a)/(-a*d+b*c)/(d*x+c))/b
```

Rubi [A]
time = 0.14, antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.210$, Rules used = {2254, 2241, 2260, 2209}

$$\frac{e^{\frac{be}{bc-ad}}\text{Ei}\left(-\frac{de(a+bx)}{(bc-ad)(c+dx)}\right)}{b}-\frac{\text{Ei}\left(\frac{e}{c+dx}\right)}{b}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x))/(a + b*x),x]
```

```
[Out] -(ExpIntegralEi[e/(c + d*x)]/b) + (E^((b*e)/(b*c - a*d))*ExpIntegralEi[-((d
*e*(a + b*x))/((b*c - a*d)*(c + d*x)))])/b
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2254

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/((e_.) + (f_.)*(x_)), x_Symbo
l] :> Dist[d/f, Int[F^(a + b/(c + d*x))/(c + d*x), x], x] - Dist[(d*e - c*f
)/f, Int[F^(a + b/(c + d*x))/((c + d*x)*(e + f*x)), x], x] /; FreeQ[{F, a,
b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
```

Rule 2260

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/(((e_.) + (f_.)*(x_))*((g_.)
+ (h_.)*(x_))), x_Symbol] :> Dist[-d/(f*(d*g - c*h)), Subst[Int[F^(a - b*(h
```

```
/(d*g - c*h)) + d*b*(x/(d*g - c*h)))/x, x], x, (g + h*x)/(c + d*x)], x] /;
FreeQ[{F, a, b, c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{\frac{e}{c+dx}}}{a+bx}\,dx &= \frac{d\int \frac{e^{\frac{e}{c+dx}}}{c+dx}\,dx}{b} - \frac{(-bc+ad)\int \frac{e^{\frac{e}{c+dx}}}{(a+bx)(c+dx)}\,dx}{b}\\ &= -\frac{\mathrm{Ei}\left(\frac{e}{c+dx}\right)}{b} + \frac{\mathrm{Subst}\left(\int \frac{\exp\left(-\frac{be}{-bc+ad}+\frac{dex}{-bc+ad}\right)}{x}\,dx, x, \frac{a+bx}{c+dx}\right)}{b}\\ &= -\frac{\mathrm{Ei}\left(\frac{e}{c+dx}\right)}{b} + \frac{e^{\frac{be}{bc-ad}}\mathrm{Ei}\left(-\frac{de(a+bx)}{(bc-ad)(c+dx)}\right)}{b}\end{aligned}$$

Mathematica [A]
time = 0.05, size = 56, normalized size = 0.90

$$\frac{-\mathrm{Ei}\left(\frac{e}{c+dx}\right)+e^{\frac{be}{bc-ad}}\mathrm{Ei}\left(e\left(\frac{b}{-bc+ad}+\frac{1}{c+dx}\right)\right)}{b}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x))/(a + b*x),x]
[Out] (-ExpIntegralEi[e/(c + d*x)] + E^((b*e)/(b*c - a*d))*ExpIntegralEi[e*(b/(-(
b*c) + a*d) + (c + d*x)^(-1))])/b
```

Maple [A]
time = 0.09, size = 79, normalized size = 1.27

method	result	size
risch	$\frac{\mathrm{expIntegral}\left(1,-\frac{e}{dx+c}\right)}{b}-\frac{\mathrm{e}^{-\frac{be}{ad-cb}}\,\mathrm{expIntegral}\left(1,-\frac{e}{dx+c}-\frac{be}{ad-cb}\right)}{b}$	65
derivativedivides	$-\frac{e\left(-\frac{d\,\mathrm{expIntegral}\left(1,-\frac{e}{dx+c}\right)}{be}+\frac{d\,\mathrm{e}^{-\frac{be}{ad-cb}}\,\mathrm{expIntegral}\left(1,-\frac{e}{dx+c}-\frac{be}{ad-cb}\right)}{be}\right)}{d}$	79
default	$-\frac{e\left(-\frac{d\,\mathrm{expIntegral}\left(1,-\frac{e}{dx+c}\right)}{be}+\frac{d\,\mathrm{e}^{-\frac{be}{ad-cb}}\,\mathrm{expIntegral}\left(1,-\frac{e}{dx+c}-\frac{be}{ad-cb}\right)}{be}\right)}{d}$	79

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(d*x+c))/(b*x+a),x,method=_RETURNVERBOSE)
```

```
[Out] -1/d*e*(-d/b/e*Ei(1,-e/(d*x+c))+d/b/e*exp(-b*e/(a*d-b*c))*Ei(1,-e/(d*x+c)-b
*e/(a*d-b*c)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))/(b*x+a),x, algorithm="maxima")
```

```
[Out] integrate(e^(e/(d*x + c))/(b*x + a), x)
```

Fricas [A]
time = 0.39, size = 73, normalized size = 1.18

$$\frac{\mathrm{Ei}\left(-\frac{(bdx+ad)e}{bc^2-acd+(bcd-ad^2)x}\right)e^{\left(\frac{be}{bc-ad}\right)}-\mathrm{Ei}\left(\frac{e}{dx+c}\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))/(b*x+a),x, algorithm="fricas")
```

```
[Out] (Ei(-(b*d*x + a*d)*e/(b*c^2 - a*c*d + (b*c*d - a*d^2)*x))*e^(b*e/(b*c - a*d
)) - Ei(e/(d*x + c)))/b
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{c+dx}}}{a+bx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))/(b*x+a),x)
```

```
[Out] Integral(exp(e/(c + d*x))/(a + b*x), x)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 492 vs. 2(64) = 128.
time = 2.03, size = 492, normalized size = 7.94

$$\frac{\left(\frac{2\,b^2c^2\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^3}{(dx+c)^2}-\frac{4\,abcd\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^3}{(dx+c)^2}+\frac{2\,a^2d^2\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^3}{(dx+c)^2}-\frac{2\,b^2c^2\mathrm{Ei}\left(-\frac{be-\frac{bce}{dx+c}+\frac{ade}{dx+c}}{bc-ad}\right)e^{\left(\frac{be}{bc-ad}+3\right)}}{(dx+c)^2}+\frac{4\,abcd\mathrm{Ei}\left(-\frac{be-\frac{bce}{dx+c}+\frac{ade}{dx+c}}{bc-ad}\right)e^{\left(\frac{be}{bc-ad}+3\right)}}{(dx+c)^2}-\frac{2\,a^2d^2\mathrm{Ei}\left(-\frac{be-\frac{bce}{dx+c}+\frac{ade}{dx+c}}{bc-ad}\right)e^{\left(\frac{be}{bc-ad}+3\right)}}{(dx+c)^2}+\frac{2\,b^2c\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^4}{(dx+c)^2}-\frac{2\,abd\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^4}{(dx+c)^2}-b^2e^{\left(\frac{e}{dx+c}+3\right)}-\frac{2\,b^2ce^{\left(\frac{e}{dx+c}+3\right)}}{dx+c}+\frac{2\,abde^{\left(\frac{e}{dx+c}+3\right)}}{dx+c}+\frac{b^2\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^5}{(dx+c)^2}-\frac{b^2e^{\left(\frac{e}{dx+c}+4\right)}}{dx+c}\right)(dx+c)^2e^{(-4)}}{2\,b^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))/(b*x+a),x, algorithm="giac")
```

```
[Out] 1/2*(2*b^2*c^2*Ei(e/(d*x + c))*e^3/(d*x + c)^2 - 4*a*b*c*d*Ei(e/(d*x + c))*
e^3/(d*x + c)^2 + 2*a^2*d^2*Ei(e/(d*x + c))*e^3/(d*x + c)^2 - 2*b^2*c^2*Ei(
-(b*e - b*c*e/(d*x + c) + a*d*e/(d*x + c))/(b*c - a*d))*e^(b*e/(b*c - a*d)
+ 3)/(d*x + c)^2 + 4*a*b*c*d*Ei(-(b*e - b*c*e/(d*x + c) + a*d*e/(d*x + c))/
(b*c - a*d))*e^(b*e/(b*c - a*d) + 3)/(d*x + c)^2 - 2*a^2*d^2*Ei(-(b*e - b*c
*e/(d*x + c) + a*d*e/(d*x + c))/(b*c - a*d))*e^(b*e/(b*c - a*d) + 3)/(d*x +
 c)^2 + 2*b^2*c*Ei(e/(d*x + c))*e^4/(d*x + c)^2 - 2*a*b*d*Ei(e/(d*x + c))*e
^4/(d*x + c)^2 - b^2*e^(e/(d*x + c) + 3) - 2*b^2*c*e^(e/(d*x + c) + 3)/(d*x
 + c) + 2*a*b*d*e^(e/(d*x + c) + 3)/(d*x + c) + b^2*Ei(e/(d*x + c))*e^5/(d*
x + c)^2 - b^2*e^(e/(d*x + c) + 4)/(d*x + c))*(d*x + c)^2*e^(-4)/(b^3*d)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{e^{\frac{e}{c+d\,x}}}{a+b\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x))/(a + b*x),x)
```

```
[Out] int(exp(e/(c + d*x))/(a + b*x), x)
```

3.407 $\int \frac{e^{\frac{e}{c+dx}}}{(a+bx)^2} \, dx$

Optimal. Leaf size=107

$$-\frac{de^{\frac{e}{c+dx}}}{b(bc-ad)}-\frac{e^{\frac{e}{c+dx}}}{b(a+bx)}-\frac{dee^{\frac{be}{bc-ad}}\mathrm{Ei}\left(-\frac{de(a+bx)}{(bc-ad)(c+dx)}\right)}{(bc-ad)^2}$$

```
[Out] -d*exp(e/(d*x+c))/b/(-a*d+b*c)-exp(e/(d*x+c))/b/(b*x+a)-d*e*exp(b*e/(-a*d+b
*c))*Ei(-d*e*(b*x+a)/(-a*d+b*c)/(d*x+c))/(-a*d+b*c)^2
```

Rubi [A]
time = 0.37, antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.368$, Rules used = {2255, 6874, 2254, 2241, 2260, 2209, 2240}

$$-\frac{dee^{\frac{be}{bc-ad}}\mathrm{Ei}\left(-\frac{de(a+bx)}{(bc-ad)(c+dx)}\right)}{(bc-ad)^2}-\frac{de^{\frac{e}{c+dx}}}{b(bc-ad)}-\frac{e^{\frac{e}{c+dx}}}{b(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x))/(a + b*x)^2,x]
```

```
[Out] -((d*E^(e/(c + d*x)))/(b*(b*c - a*d))) - E^(e/(c + d*x))/(b*(a + b*x)) - (d
*e*E^((b*e)/(b*c - a*d))*ExpIntegralEi[-((d*e*(a + b*x))/((b*c - a*d)*(c +
d*x)))])/(b*c - a*d)^2
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2254

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/((e_.) + (f_.)*(x_)), x_Symbo
l] :> Dist[d/f, Int[F^(a + b/(c + d*x))/(c + d*x), x], x] - Dist[(d*e - c*f
)/f, Int[F^(a + b/(c + d*x))/((c + d*x)*(e + f*x)), x], x] /; FreeQ[{F, a,
b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
```

Rule 2255

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))*((e_.) + (f_.)*(x_))^(m_), x_
Symbol] :> Simp[(e + f*x)^(m + 1)*(F^(a + b/(c + d*x))/(f*(m + 1))), x] + D
ist[b*d*(Log[F]/(f*(m + 1))), Int[(e + f*x)^(m + 1)*(F^(a + b/(c + d*x))/(c
 + d*x)^2), x], x] /; FreeQ[{F, a, b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
&& ILtQ[m, -1]
```

Rule 2260

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/(((e_.) + (f_.)*(x_))*((g_.)
+ (h_.)*(x_))), x_Symbol] :> Dist[-d/(f*(d*g - c*h)), Subst[Int[F^(a - b*(h
/(d*g - c*h)) + d*b*(x/(d*g - c*h)))/x, x], x, (g + h*x)/(c + d*x)], x] /;
FreeQ[{F, a, b, c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{e^{\frac{e}{c+dx}}}{(a+bx)^2}\,dx = -\frac{e^{\frac{e}{c+dx}}}{b(a+bx)} - \frac{(de)\int \frac{e^{\frac{e}{c+dx}}}{(a+bx)(c+dx)^2}\,dx}{b}$$

$$= -\frac{e^{\frac{e}{c+dx}}}{b(a+bx)} - \frac{(de)\int \left(\frac{b^2 e^{\frac{e}{c+dx}}}{(bc-ad)^2(a+bx)} - \frac{de^{\frac{e}{c+dx}}}{(bc-ad)(c+dx)^2} - \frac{bde^{\frac{e}{c+dx}}}{(bc-ad)^2(c+dx)}\right)dx}{b}$$

$$= -\frac{e^{\frac{e}{c+dx}}}{b(a+bx)} - \frac{(bde)\int \frac{e^{\frac{e}{c+dx}}}{a+bx}\,dx}{(bc-ad)^2} + \frac{(d^2e)\int \frac{e^{\frac{e}{c+dx}}}{c+dx}\,dx}{(bc-ad)^2} + \frac{(d^2e)\int \frac{e^{\frac{e}{c+dx}}}{(c+dx)^2}\,dx}{b(bc-ad)}$$

$$= -\frac{de^{\frac{e}{c+dx}}}{b(bc-ad)} - \frac{e^{\frac{e}{c+dx}}}{b(a+bx)} - \frac{de\text{Ei}\left(\frac{e}{c+dx}\right)}{(bc-ad)^2} - \frac{(d^2e)\int \frac{e^{\frac{e}{c+dx}}}{c+dx}\,dx}{(bc-ad)^2} - \frac{(de)\int \frac{e^{\frac{e}{c+dx}}}{(a+bx)(c+dx)}\,dx}{bc-ad}$$

$$= -\frac{de^{\frac{e}{c+dx}}}{b(bc-ad)} - \frac{e^{\frac{e}{c+dx}}}{b(a+bx)} - \frac{(de)\text{Subst}\left(\int \frac{\exp\left(-\frac{be}{-bc+ad}+\frac{dex}{-bc+ad}\right)}{x}\,dx, x, \frac{a+bx}{c+dx}\right)}{(bc-ad)^2}$$

$$= -\frac{de^{\frac{e}{c+dx}}}{b(bc-ad)} - \frac{e^{\frac{e}{c+dx}}}{b(a+bx)} - \frac{dee^{\frac{be}{bc-ad}}\text{Ei}\left(-\frac{de(a+bx)}{(bc-ad)(c+dx)}\right)}{(bc-ad)^2}$$

Mathematica [A]
time = 0.10, size = 105, normalized size = 0.98

$$-\frac{de^{\frac{e}{c+dx}}}{b(bc-ad)} - \frac{e^{\frac{e}{c+dx}}}{b(a+bx)} - \frac{dee^{\frac{be}{bc-ad}}\text{Ei}\left(-\frac{be}{bc-ad}+\frac{e}{c+dx}\right)}{(-bc+ad)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x))/(a + b*x)^2,x]
[Out] -((d*E^(e/(c + d*x)))/(b*(b*c - a*d))) - E^(e/(c + d*x))/(b*(a + b*x)) - (d
*e*E^((b*e)/(b*c - a*d))*ExpIntegralEi[-((b*e)/(b*c - a*d)) + e/(c + d*x)])
/(-(b*c) + a*d)^2
```

Maple [A]
time = 0.08, size = 97, normalized size = 0.91

method	result	size
derivativedivides	$-\frac{de\left(-\frac{e^{\frac{e}{dx+c}}}{\frac{e}{dx+c}+\frac{be}{ad-cb}}-e^{-\frac{be}{ad-cb}}\,\text{expIntegral}\left(1,-\frac{e}{dx+c}-\frac{be}{ad-cb}\right)\right)}{(ad-cb)^2}$	97
default	$-\frac{de\left(-\frac{e^{\frac{e}{dx+c}}}{\frac{e}{dx+c}+\frac{be}{ad-cb}}-e^{-\frac{be}{ad-cb}}\,\text{expIntegral}\left(1,-\frac{e}{dx+c}-\frac{be}{ad-cb}\right)\right)}{(ad-cb)^2}$	97

risch	$\frac{ed\,e^{\frac{e}{dx+c}}}{(ad-cb)^2\left(\frac{e}{dx+c}+\frac{be}{ad-cb}\right)}+\frac{ed\,e^{-\frac{be}{ad-cb}}\,\text{expIntegral}\left(1,-\frac{e}{dx+c}-\frac{be}{ad-cb}\right)}{(ad-cb)^2}$	105

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(d*x+c))/(b*x+a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -d*e/(a*d-b*c)^2*(-exp(e/(d*x+c))/(e/(d*x+c)+b*e/(a*d-b*c))-exp(-b*e/(a*d-b
*c))*Ei(1,-e/(d*x+c)-b*e/(a*d-b*c)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))/(b*x+a)^2,x, algorithm="maxima")
```

```
[Out] integrate(e^(e/(d*x + c))/(b*x + a)^2, x)
```

Fricas [A]
time = 0.35, size = 156, normalized size = 1.46

$$-\frac{(bdx+ad)\text{Ei}\left(-\frac{(bdx+ad)e}{bc^2-acd+(bcd-ad^2)x}\right)e^{\left(\frac{be}{bc-ad}+1\right)}+(bc^2-acd+(bcd-ad^2)x)e^{\left(\frac{e}{dx+c}\right)}}{ab^2c^2-2\,a^2bcd+a^3d^2+(b^3c^2-2\,ab^2cd+a^2bd^2)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))/(b*x+a)^2,x, algorithm="fricas")
```

```
[Out] -((b*d*x + a*d)*Ei(-(b*d*x + a*d)*e/(b*c^2 - a*c*d + (b*c*d - a*d^2)*x))*e^
(b*e/(b*c - a*d) + 1) + (b*c^2 - a*c*d + (b*c*d - a*d^2)*x)*e^(e/(d*x + c))
)/(a*b^2*c^2 - 2*a^2*b*c*d + a^3*d^2 + (b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*
x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{e^{\frac{e}{c+dx}}}{(a+bx)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))/(b*x+a)**2,x)
```

```
[Out] Integral(exp(e/(c + d*x))/(a + b*x)**2, x)
```

Giac [**B**] Leaf count of result is larger than twice the leaf count of optimal. 345 vs. 2(109) = 218.
time = 2.35, size = 345, normalized size = 3.22

$$-\frac{\left(b\mathrm{Ei}\left(-\frac{be-\frac{bce}{dx+c}+\frac{ade}{dx+c}}{bc-ad}\right)e^{\left(\frac{be}{bc-ad}+3\right)}-\frac{bc\mathrm{Ei}\left(-\frac{be-\frac{bce}{dx+c}+\frac{ade}{dx+c}}{bc-ad}\right)e^{\left(\frac{be}{bc-ad}+3\right)}}{dx+c}+\frac{ad\mathrm{Ei}\left(-\frac{be-\frac{bce}{dx+c}+\frac{ade}{dx+c}}{bc-ad}\right)e^{\left(\frac{be}{bc-ad}+3\right)}}{dx+c}+bce^{\left(\frac{e}{dx+c}+2\right)}-ade^{\left(\frac{e}{dx+c}+2\right)}\right)de^{(-1)}}{b^3c^2e-\frac{b^3c^3e}{dx+c}-2\,ab^2cde+\frac{3\,ab^2c^2de}{dx+c}+a^2bd^2e-\frac{3\,a^2bcd^2e}{dx+c}+\frac{a^3d^3e}{dx+c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))/(b*x+a)^2,x, algorithm="giac")
```

```
[Out] -(b*Ei(-(b*e - b*c*e/(d*x + c) + a*d*e/(d*x + c))/(b*c - a*d))*e^(b*e/(b*c
- a*d) + 3) - b*c*Ei(-(b*e - b*c*e/(d*x + c) + a*d*e/(d*x + c))/(b*c - a*d)
)*e^(b*e/(b*c - a*d) + 3)/(d*x + c) + a*d*Ei(-(b*e - b*c*e/(d*x + c) + a*d*
e/(d*x + c))/(b*c - a*d))*e^(b*e/(b*c - a*d) + 3)/(d*x + c) + b*c*e^(e/(d*x
 + c) + 2) - a*d*e^(e/(d*x + c) + 2))*d*e^(-1)/(b^3*c^2*e - b^3*c^3*e/(d*x
+ c) - 2*a*b^2*c*d*e + 3*a*b^2*c^2*d*e/(d*x + c) + a^2*b*d^2*e - 3*a^2*b*c*
d^2*e/(d*x + c) + a^3*d^3*e/(d*x + c))
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{e}^{\frac{e}{c+d\,x}}}{{\left(a+b\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x))/(a + b*x)^2,x)
```

```
[Out] int(exp(e/(c + d*x))/(a + b*x)^2, x)
```

3.408 $\int \frac{e^{\frac{e}{c+dx}}}{(a+bx)^3}\,dx$

Optimal. Leaf size=240

$$\frac{d^2e^{\frac{e}{c+dx}}}{2b(bc-ad)^2}+\frac{d^2ee^{\frac{e}{c+dx}}}{2(bc-ad)^3}-\frac{e^{\frac{e}{c+dx}}}{2b(a+bx)^2}+\frac{dee^{\frac{e}{c+dx}}}{2(bc-ad)^2(a+bx)}+\frac{d^2ee^{\frac{be}{bc-ad}}\mathrm{Ei}\left(-\frac{de(a+bx)}{(bc-ad)(c+dx)}\right)}{(bc-ad)^3}+\frac{bd^2e^2e^{\frac{be}{bc-ad}}\mathrm{Ei}}{2(bc}$$

```
[Out] 1/2*d^2*exp(e/(d*x+c))/b/(-a*d+b*c)^2+1/2*d^2*e*exp(e/(d*x+c))/(-a*d+b*c)^3
-1/2*exp(e/(d*x+c))/b/(b*x+a)^2+1/2*d*e*exp(e/(d*x+c))/(-a*d+b*c)^2/(b*x+a)
+d^2*e*exp(b*e/(-a*d+b*c))*Ei(-d*e*(b*x+a)/(-a*d+b*c)/(d*x+c))/(-a*d+b*c)^3
+1/2*b*d^2*e^2*exp(b*e/(-a*d+b*c))*Ei(-d*e*(b*x+a)/(-a*d+b*c)/(d*x+c))/(-a*
d+b*c)^4
```

Rubi [A]
time = 0.71, antiderivative size = 240, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 7, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.368, Rules used = {2255, 6874, 2254, 2241, 2260, 2209, 2240}

$$\frac{bd^2e^2e^{\frac{be}{bc-ad}}\mathrm{Ei}\left(-\frac{de(a+bx)}{(bc-ad)(c+dx)}\right)}{2(bc-ad)^4}+\frac{d^2ee^{\frac{be}{bc-ad}}\mathrm{Ei}\left(-\frac{de(a+bx)}{(bc-ad)(c+dx)}\right)}{(bc-ad)^3}+\frac{d^2ee^{\frac{e}{c+dx}}}{2(bc-ad)^3}+\frac{d^2e^{\frac{e}{c+dx}}}{2b(bc-ad)^2}+\frac{dee^{\frac{e}{c+dx}}}{2(a+bx)(bc-ad)^2}-\frac{e^{\frac{e}{c+dx}}}{2b(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x))/(a + b*x)^3,x]
```

```
[Out] (d^2*E^(e/(c + d*x)))/(2*b*(b*c - a*d)^2) + (d^2*e*E^(e/(c + d*x)))/(2*(b*c
 - a*d)^3) - E^(e/(c + d*x))/(2*b*(a + b*x)^2) + (d*e*E^(e/(c + d*x)))/(2*(
b*c - a*d)^2*(a + b*x)) + (d^2*e*E^((b*e)/(b*c - a*d))*ExpIntegralEi[-((d*e
*(a + b*x))/((b*c - a*d)*(c + d*x)))])/(b*c - a*d)^3 + (b*d^2*e^2*E^((b*e)/
(b*c - a*d))*ExpIntegralEi[-((d*e*(a + b*x))/((b*c - a*d)*(c + d*x)))])/(2*
(b*c - a*d)^4)
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2254

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/((e_.) + (f_.)*(x_)), x_Symbo
l] :> Dist[d/f, Int[F^(a + b/(c + d*x))/(c + d*x), x], x] - Dist[(d*e - c*f
)/f, Int[F^(a + b/(c + d*x))/((c + d*x)*(e + f*x)), x], x] /; FreeQ[{F, a,
b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
```

Rule 2255

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))*((e_.) + (f_.)*(x_))^(m_), x_
Symbol] :> Simp[(e + f*x)^(m + 1)*(F^(a + b/(c + d*x))/(f*(m + 1))), x] + D
ist[b*d*(Log[F]/(f*(m + 1))), Int[(e + f*x)^(m + 1)*(F^(a + b/(c + d*x))/(c
 + d*x)^2), x], x] /; FreeQ[{F, a, b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
&& ILtQ[m, -1]
```

Rule 2260

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/(((e_.) + (f_.)*(x_))*((g_.)
+ (h_.)*(x_))), x_Symbol] :> Dist[-d/(f*(d*g - c*h)), Subst[Int[F^(a - b*(h
/(d*g - c*h)) + d*b*(x/(d*g - c*h)))/x, x], x, (g + h*x)/(c + d*x)], x] /;
FreeQ[{F, a, b, c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{e^{\frac{e}{c+dx}}}{(a+bx)^3}\,dx = -\frac{e^{\frac{e}{c+dx}}}{2b(a+bx)^2} - \frac{(de)\int \frac{e^{\frac{e}{c+dx}}}{(a+bx)^2(c+dx)^2}\,dx}{2b}$$

$$= -\frac{e^{\frac{e}{c+dx}}}{2b(a+bx)^2} - \frac{(de)\int \left(\frac{b^2e^{\frac{e}{c+dx}}}{(bc-ad)^2(a+bx)^2} - \frac{2b^2de^{\frac{e}{c+dx}}}{(bc-ad)^3(a+bx)} + \frac{d^2e^{\frac{e}{c+dx}}}{(bc-ad)^2(c+dx)^2} + \frac{2bd^2e^{\frac{e}{c+dx}}}{(bc-ad)^3(c+dx)}\right) d}{2b}$$

$$= -\frac{e^{\frac{e}{c+dx}}}{2b(a+bx)^2} + \frac{(bd^2e)\int \frac{e^{\frac{e}{c+dx}}}{a+bx}\,dx}{(bc-ad)^3} - \frac{(d^3e)\int \frac{e^{\frac{e}{c+dx}}}{c+dx}\,dx}{(bc-ad)^3} - \frac{(bde)\int \frac{e^{\frac{e}{c+dx}}}{(a+bx)^2}\,dx}{2(bc-ad)^2} - \frac{(d^3e)\int \frac{e^{\frac{e}{c+d}}}{(c+dx}}{2b(bc-a}$$

$$= \frac{d^2e^{\frac{e}{c+dx}}}{2b(bc-ad)^2} - \frac{e^{\frac{e}{c+dx}}}{2b(a+bx)^2} + \frac{dee^{\frac{e}{c+dx}}}{2(bc-ad)^2(a+bx)} + \frac{d^2e\text{Ei}\left(\frac{e}{c+dx}\right)}{(bc-ad)^3} + \frac{(d^3e)\int \frac{e^{\frac{e}{c+dx}}}{c+dx}\,dx}{(bc-ad)^3} +$$

$$= \frac{d^2e^{\frac{e}{c+dx}}}{2b(bc-ad)^2} - \frac{e^{\frac{e}{c+dx}}}{2b(a+bx)^2} + \frac{dee^{\frac{e}{c+dx}}}{2(bc-ad)^2(a+bx)} + \frac{(d^2e)\,\text{Subst}\left(\int \frac{\exp\left(-\frac{be}{-bc+ad}+\frac{dex}{-bc+ad}\right)}{x}\right.}{(bc-ad)^3}$$

$$= \frac{d^2e^{\frac{e}{c+dx}}}{2b(bc-ad)^2} - \frac{e^{\frac{e}{c+dx}}}{2b(a+bx)^2} + \frac{dee^{\frac{e}{c+dx}}}{2(bc-ad)^2(a+bx)} + \frac{d^2ee^{\frac{be}{bc-ad}}\text{Ei}\left(-\frac{de(a+bx)}{(bc-ad)(c+dx)}\right)}{(bc-ad)^3} + \frac{(b^2d}{}$$

$$= \frac{d^2e^{\frac{e}{c+dx}}}{2b(bc-ad)^2} + \frac{d^2ee^{\frac{e}{c+dx}}}{2(bc-ad)^3} - \frac{e^{\frac{e}{c+dx}}}{2b(a+bx)^2} + \frac{dee^{\frac{e}{c+dx}}}{2(bc-ad)^2(a+bx)} + \frac{bd^2e^2\text{Ei}\left(\frac{e}{c+dx}\right)}{2(bc-ad)^4} + \frac{d^2e}{}$$

$$= \frac{d^2e^{\frac{e}{c+dx}}}{2b(bc-ad)^2} + \frac{d^2ee^{\frac{e}{c+dx}}}{2(bc-ad)^3} - \frac{e^{\frac{e}{c+dx}}}{2b(a+bx)^2} + \frac{dee^{\frac{e}{c+dx}}}{2(bc-ad)^2(a+bx)} + \frac{d^2ee^{\frac{be}{bc-ad}}\text{Ei}\left(-\frac{de(a}{(bc-ad}\right.}{(bc-ad)^3}$$

$$= \frac{d^2e^{\frac{e}{c+dx}}}{2b(bc-ad)^2} + \frac{d^2ee^{\frac{e}{c+dx}}}{2(bc-ad)^3} - \frac{e^{\frac{e}{c+dx}}}{2b(a+bx)^2} + \frac{dee^{\frac{e}{c+dx}}}{2(bc-ad)^2(a+bx)} + \frac{d^2ee^{\frac{be}{bc-ad}}\text{Ei}\left(-\frac{de(a}{(bc-ad}\right.}{(bc-ad)^3}$$

Mathematica [F]
time = 0.25, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{c+dx}}}{(a+bx)^3}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[E^(e/(c + d*x))/(a + b*x)^3,x]
```

```
[Out] Integrate[E^(e/(c + d*x))/(a + b*x)^3, x]
```

Maple [A]
time = 0.08, size = 240, normalized size = 1.00

method	result
derivativedivides	$-\frac{e\left(\frac{d^3\left(-\frac{e^{\frac{e}{dx+c}}}{\frac{e}{dx+c}+\frac{be}{ad-cb}}-e^{-\frac{be}{ad-cb}}\,\text{expIntegral}\left(1,-\frac{e}{dx+c}-\frac{be}{ad-cb}\right)\right)}{(ad-cb)^3}-\frac{be\,d^3\left(-\frac{e^{\frac{e}{dx+c}}}{2\left(\frac{e}{dx+c}+\frac{be}{ad-cb}\right)^2}-\frac{e^{\frac{e}{dx+c}}}{2\left(\frac{e}{dx+c}+\frac{be}{ad-cb}\right)}-\frac{e^{-\frac{be}{ad}}\cdots}{\cdots}\right.}{(ad-cb)^4}\cdots\right.}{d}$
default	$-\frac{e\left(\frac{d^3\left(-\frac{e^{\frac{e}{dx+c}}}{\frac{e}{dx+c}+\frac{be}{ad-cb}}-e^{-\frac{be}{ad-cb}}\,\text{expIntegral}\left(1,-\frac{e}{dx+c}-\frac{be}{ad-cb}\right)\right)}{(ad-cb)^3}-\frac{be\,d^3\left(-\frac{e^{\frac{e}{dx+c}}}{2\left(\frac{e}{dx+c}+\frac{be}{ad-cb}\right)^2}-\frac{e^{\frac{e}{dx+c}}}{2\left(\frac{e}{dx+c}+\frac{be}{ad-cb}\right)}-\frac{e^{-\frac{be}{ad}}\cdots}{\cdots}\right.}{(ad-cb)^4}\cdots\right.}{d}$
risch	$\frac{e\,d^2 e^{\frac{e}{dx+c}}}{(ad-cb)^3\left(\frac{e}{dx+c}+\frac{be}{ad-cb}\right)}+\frac{e\,d^2 e^{-\frac{be}{ad-cb}}\,\text{expIntegral}\left(1,-\frac{e}{dx+c}-\frac{be}{ad-cb}\right)}{(ad-cb)^3}-\frac{e^2 d^2 b\, e^{\frac{e}{dx+c}}}{2(ad-cb)^4\left(\frac{e}{dx+c}+\frac{be}{ad-cb}\right)^2}-\frac{e\cdots}{2(ad-cb\cdots}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(d*x+c))/(b*x+a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/d*e*(d^3/(a*d-b*c)^3*(-exp(e/(d*x+c))/(e/(d*x+c)+b*e/(a*d-b*c))-exp(-b*e
/(a*d-b*c))*Ei(1,-e/(d*x+c)-b*e/(a*d-b*c)))-b*e/(a*d-b*c)^4*d^3*(-1/2*exp(e
/(d*x+c))/(e/(d*x+c)+b*e/(a*d-b*c))^2-1/2*exp(e/(d*x+c))/(e/(d*x+c)+b*e/(a*
d-b*c))-1/2*exp(-b*e/(a*d-b*c))*Ei(1,-e/(d*x+c)-b*e/(a*d-b*c))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))/(b*x+a)^3,x, algorithm="maxima")
```

```
[Out] integrate(e^(e/(d*x + c))/(b*x + a)^3, x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 513 vs. $2(234) = 468$.
time = 0.38, size = 513, normalized size = 2.14

$$\frac{((b^3d^2x^2+2\,ab^2d^2x+a^2bd^2)e^2+2\,(a^2bcd^2-a^3d^3+(b^3cd^2-ab^2d^3)x^2+2\,(ab^2cd^2-a^2bd^3)x)e)\mathrm{Ei}\left(-\frac{(bdx+ad)e}{bc^2-acd+(bcd-ad^2)x}\right)e^{\left(\frac{be}{bc-ad}\right)}-(b^3c^4-4\,ab^2c^3d+5\,a^2bc^2d^2-2\,a^3cd^3-(b^3c^2d^2-2\,ab^2cd^3+a^2bd^4)x^2-2\,(ab^2c^2d^2-2\,a^2bcd^3+a^3d^4)x-(ab^2c^2d-a^2bcd^2+(b^3cd^2-ab^2d^3)x^2+(b^3c^2d-a^2bd^3)x)e)e^{\left(\frac{e}{dx+c}\right)}}{2\,(a^2b^4c^4-4\,a^3b^3c^3d+6\,a^4b^2c^2d^2-4\,a^5bcd^3+a^6d^4+(b^6c^4-4\,ab^5c^3d+6\,a^2b^4c^2d^2-4\,a^3b^3cd^3+a^4b^2d^4)x^2+2\,(ab^5c^4-4\,a^2b^4c^3d+6\,a^3b^3c^2d^2-4\,a^4b^2cd^3+a^5bd^4)x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))/(b*x+a)^3,x, algorithm="fricas")
```

```
[Out] 1/2*(((b^3*d^2*x^2 + 2*a*b^2*d^2*x + a^2*b*d^2)*e^2 + 2*(a^2*b*c*d^2 - a^3*
d^3 + (b^3*c*d^2 - a*b^2*d^3)*x^2 + 2*(a*b^2*c*d^2 - a^2*b*d^3)*x)*e)*Ei(-(
```

```
b*d*x + a*d)*e/(b*c^2 - a*c*d + (b*c*d - a*d^2)*x))*e^(b*e/(b*c - a*d)) - (
b^3*c^4 - 4*a*b^2*c^3*d + 5*a^2*b*c^2*d^2 - 2*a^3*c*d^3 - (b^3*c^2*d^2 - 2*
a*b^2*c*d^3 + a^2*b*d^4)*x^2 - 2*(a*b^2*c^2*d^2 - 2*a^2*b*c*d^3 + a^3*d^4)*
x - (a*b^2*c^2*d - a^2*b*c*d^2 + (b^3*c*d^2 - a*b^2*d^3)*x^2 + (b^3*c^2*d -
 a^2*b*d^3)*x)*e)*e^(e/(d*x + c)))/(a^2*b^4*c^4 - 4*a^3*b^3*c^3*d + 6*a^4*b
^2*c^2*d^2 - 4*a^5*b*c*d^3 + a^6*d^4 + (b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4
*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*x^2 + 2*(a*b^5*c^4 - 4*a^2*b^4*c^
3*d + 6*a^3*b^3*c^2*d^2 - 4*a^4*b^2*c*d^3 + a^5*b*d^4)*x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{c+dx}}}{(a+bx)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))/(b*x+a)**3,x)
```

```
[Out] Integral(exp(e/(c + d*x))/(a + b*x)**3, x)
```

Giac [**B**] Leaf count of result is larger than twice the leaf count of optimal. 1759 vs. $2(234) = 468$.
time = 2.56, size = 1759, normalized size = 7.33

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))/(b*x+a)^3,x, algorithm="giac")
```

```
[Out] 1/2*(2*b^3*c*d*Ei(-(b*e - b*c*e/(d*x + c) + a*d*e/(d*x + c))/(b*c - a*d))*e
^(b*e/(b*c - a*d) + 4) - 4*b^3*c^2*d*Ei(-(b*e - b*c*e/(d*x + c) + a*d*e/(d*
x + c))/(b*c - a*d))*e^(b*e/(b*c - a*d) + 4)/(d*x + c) + 2*b^3*c^3*d*Ei(-(b
*e - b*c*e/(d*x + c) + a*d*e/(d*x + c))/(b*c - a*d))*e^(b*e/(b*c - a*d) + 4
)/(d*x + c)^2 - 2*a*b^2*d^2*Ei(-(b*e - b*c*e/(d*x + c) + a*d*e/(d*x + c))/(
b*c - a*d))*e^(b*e/(b*c - a*d) + 4) + 8*a*b^2*c*d^2*Ei(-(b*e - b*c*e/(d*x +
 c) + a*d*e/(d*x + c))/(b*c - a*d))*e^(b*e/(b*c - a*d) + 4)/(d*x + c) - 6*a
*b^2*c^2*d^2*Ei(-(b*e - b*c*e/(d*x + c) + a*d*e/(d*x + c))/(b*c - a*d))*e^(
b*e/(b*c - a*d) + 4)/(d*x + c)^2 - 4*a^2*b*d^3*Ei(-(b*e - b*c*e/(d*x + c) +
 a*d*e/(d*x + c))/(b*c - a*d))*e^(b*e/(b*c - a*d) + 4)/(d*x + c) + 6*a^2*b*
c*d^3*Ei(-(b*e - b*c*e/(d*x + c) + a*d*e/(d*x + c))/(b*c - a*d))*e^(b*e/(b*
c - a*d) + 4)/(d*x + c)^2 - 2*a^3*d^4*Ei(-(b*e - b*c*e/(d*x + c) + a*d*e/(d
*x + c))/(b*c - a*d))*e^(b*e/(b*c - a*d) + 4)/(d*x + c)^2 + b^3*c^2*d*e^(e/
(d*x + c) + 3) - 2*b^3*c^3*d*e^(e/(d*x + c) + 3)/(d*x + c) - 2*a*b^2*c*d^2*
e^(e/(d*x + c) + 3) + 6*a*b^2*c^2*d^2*e^(e/(d*x + c) + 3)/(d*x + c) + a^2*b
*d^3*e^(e/(d*x + c) + 3) - 6*a^2*b*c*d^3*e^(e/(d*x + c) + 3)/(d*x + c) + 2*
a^3*d^4*e^(e/(d*x + c) + 3)/(d*x + c) + b^3*d*Ei(-(b*e - b*c*e/(d*x + c) +
```

```
a*d*e/(d*x + c))/(b*c - a*d))*e^(b*e/(b*c - a*d) + 5) - 2*b^3*c*d*Ei(-(b*e
- b*c*e/(d*x + c) + a*d*e/(d*x + c))/(b*c - a*d))*e^(b*e/(b*c - a*d) + 5)/(
d*x + c) + b^3*c^2*d*Ei(-(b*e - b*c*e/(d*x + c) + a*d*e/(d*x + c))/(b*c - a
*d))*e^(b*e/(b*c - a*d) + 5)/(d*x + c)^2 + 2*a*b^2*d^2*Ei(-(b*e - b*c*e/(d*
x + c) + a*d*e/(d*x + c))/(b*c - a*d))*e^(b*e/(b*c - a*d) + 5)/(d*x + c) -
2*a*b^2*c*d^2*Ei(-(b*e - b*c*e/(d*x + c) + a*d*e/(d*x + c))/(b*c - a*d))*e^
(b*e/(b*c - a*d) + 5)/(d*x + c)^2 + a^2*b*d^3*Ei(-(b*e - b*c*e/(d*x + c) +
a*d*e/(d*x + c))/(b*c - a*d))*e^(b*e/(b*c - a*d) + 5)/(d*x + c)^2 + b^3*c*d
*e^(e/(d*x + c) + 4) - b^3*c^2*d*e^(e/(d*x + c) + 4)/(d*x + c) - a*b^2*d^2*
e^(e/(d*x + c) + 4) + 2*a*b^2*c*d^2*e^(e/(d*x + c) + 4)/(d*x + c) - a^2*b*d
^3*e^(e/(d*x + c) + 4)/(d*x + c))*d*e^(-1)/(b^6*c^4*e^2 - 2*b^6*c^5*e^2/(d*
x + c) + b^6*c^6*e^2/(d*x + c)^2 - 4*a*b^5*c^3*d*e^2 + 10*a*b^5*c^4*d*e^2/(
d*x + c) - 6*a*b^5*c^5*d*e^2/(d*x + c)^2 + 6*a^2*b^4*c^2*d^2*e^2 - 20*a^2*b
^4*c^3*d^2*e^2/(d*x + c) + 15*a^2*b^4*c^4*d^2*e^2/(d*x + c)^2 - 4*a^3*b^3*c
*d^3*e^2 + 20*a^3*b^3*c^2*d^3*e^2/(d*x + c) - 20*a^3*b^3*c^3*d^3*e^2/(d*x +
 c)^2 + a^4*b^2*d^4*e^2 - 10*a^4*b^2*c*d^4*e^2/(d*x + c) + 15*a^4*b^2*c^2*d
^4*e^2/(d*x + c)^2 + 2*a^5*b*d^5*e^2/(d*x + c) - 6*a^5*b*c*d^5*e^2/(d*x + c
)^2 + a^6*d^6*e^2/(d*x + c)^2)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{e}^{\frac{e}{c+d\,x}}}{{\left(a+b\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x))/(a + b*x)^3,x)
[Out] int(exp(e/(c + d*x))/(a + b*x)^3, x)
```

3.409 $\int e^{\frac{e}{(c+dx)^2}}(a+bx)^3\,dx$

Optimal. Leaf size=322

$$-\frac{(bc-ad)^3e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^4}-\frac{2b^2(bc-ad)ee^{\frac{e}{(c+dx)^2}}(c+dx)}{d^4}+\frac{3b(bc-ad)^2e^{\frac{e}{(c+dx)^2}}(c+dx)^2}{2d^4}+\frac{b^3ee^{\frac{e}{(c+dx)^2}}(c+$$

```
[Out] -(-a*d+b*c)^3*exp(e/(d*x+c)^2)*(d*x+c)/d^4-2*b^2*(-a*d+b*c)*e*exp(e/(d*x+c)
^2)*(d*x+c)/d^4+3/2*b*(-a*d+b*c)^2*exp(e/(d*x+c)^2)*(d*x+c)^2/d^4+1/4*b^3*e
*exp(e/(d*x+c)^2)*(d*x+c)^2/d^4-b^2*(-a*d+b*c)*exp(e/(d*x+c)^2)*(d*x+c)^3/d
^4+1/4*b^3*exp(e/(d*x+c)^2)*(d*x+c)^4/d^4-3/2*b*(-a*d+b*c)^2*e*Ei(e/(d*x+c)
^2)/d^4-1/4*b^3*e^2*Ei(e/(d*x+c)^2)/d^4+2*b^2*(-a*d+b*c)*e^(3/2)*erfi(e^(1/
2)/(d*x+c))*Pi^(1/2)/d^4+(-a*d+b*c)^3*erfi(e^(1/2)/(d*x+c))*e^(1/2)*Pi^(1/2
)/d^4
```

Rubi [A]
time = 0.24, antiderivative size = 322, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.316$, Rules used = {2258, 2237, 2242, 2235, 2245, 2241}

$$\frac{2\sqrt{\pi}\,b^2e^{3/2}(bc-ad)\text{Erfi}\left(\frac{\sqrt{e}}{c+dx}\right)}{d^4}-\frac{b^2(c+dx)^3(bc-ad)e^{\frac{e}{(c+dx)^2}}}{d^4}-\frac{2b^2e(c+dx)(bc-ad)e^{\frac{e}{(c+dx)^2}}}{d^4}+\frac{\sqrt{\pi}\,\sqrt{e}\,(bc-ad)^3\text{Erfi}\left(\frac{\sqrt{e}}{c+dx}\right)}{d^4}-\frac{3be(bc-ad)^2\text{Ei}\left(\frac{e}{(c+dx)^2}\right)}{2d^4}+\frac{3b(c+dx)^2(bc-ad)^2e^{\frac{e}{(c+dx)^2}}}{2d^4}-\frac{(c+dx)(bc-ad)^3e^{\frac{e}{(c+dx)^2}}}{d^4}-\frac{b^3e^2\text{Ei}\left(\frac{e}{(c+dx)^2}\right)}{4d^4}+\frac{b^3(c+dx)^4e^{\frac{e}{(c+dx)^2}}}{4d^4}+\frac{b^3e(c+dx)^2e^{\frac{e}{(c+dx)^2}}}{4d^4}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x)^2)*(a + b*x)^3,x]
```

```
[Out] -(((b*c - a*d)^3*E^(e/(c + d*x)^2)*(c + d*x))/d^4) - (2*b^2*(b*c - a*d)*e*E
^(e/(c + d*x)^2)*(c + d*x))/d^4 + (3*b*(b*c - a*d)^2*E^(e/(c + d*x)^2)*(c +
 d*x)^2)/(2*d^4) + (b^3*e*E^(e/(c + d*x)^2)*(c + d*x)^2)/(4*d^4) - (b^2*(b*
c - a*d)*E^(e/(c + d*x)^2)*(c + d*x)^3)/d^4 + (b^3*E^(e/(c + d*x)^2)*(c + d
*x)^4)/(4*d^4) + ((b*c - a*d)^3*Sqrt[e]*Sqrt[Pi]*Erfi[Sqrt[e]/(c + d*x)])/d
^4 + (2*b^2*(b*c - a*d)*e^(3/2)*Sqrt[Pi]*Erfi[Sqrt[e]/(c + d*x)])/d^4 - (3*
b*(b*c - a*d)^2*e*ExpIntegralEi[e/(c + d*x)^2])/(2*d^4) - (b^3*e^2*ExpInteg
ralEi[e/(c + d*x)^2])/(4*d^4)
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
```

```
LtQ[n, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int e^{\frac{e}{(c+dx)^2}}(a+bx)^3\,dx = \int \left(\frac{(-bc+ad)^3 e^{\frac{e}{(c+dx)^2}}}{d^3} + \frac{3b(bc-ad)^2 e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^3} - \frac{3b^2(bc-ad)e^{\frac{e}{(c+dx)^2}}(c+\right.$$

$$= \frac{b^3 \int e^{\frac{e}{(c+dx)^2}}(c+dx)^3\,dx}{d^3} - \frac{(3b^2(bc-ad))\int e^{\frac{e}{(c+dx)^2}}(c+dx)^2\,dx}{d^3} + \frac{(3b(bc-ad)^2)\int}{}$$

$$= -\frac{(bc-ad)^3 e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^4} + \frac{3b(bc-ad)^2 e^{\frac{e}{(c+dx)^2}}(c+dx)^2}{2d^4} - \frac{b^2(bc-ad)e^{\frac{e}{(c+dx)^2}}(}{d^4}$$

$$= -\frac{(bc-ad)^3 e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^4} - \frac{2b^2(bc-ad)ee^{\frac{e}{(c+dx)^2}}(c+dx)}{d^4} + \frac{3b(bc-ad)^2 e^{\frac{e}{(c+dx)^2}}}{2d^4}$$

$$= -\frac{(bc-ad)^3 e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^4} - \frac{2b^2(bc-ad)ee^{\frac{e}{(c+dx)^2}}(c+dx)}{d^4} + \frac{3b(bc-ad)^2 e^{\frac{e}{(c+dx)^2}}}{2d^4}$$

$$= -\frac{(bc-ad)^3 e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^4} - \frac{2b^2(bc-ad)ee^{\frac{e}{(c+dx)^2}}(c+dx)}{d^4} + \frac{3b(bc-ad)^2 e^{\frac{e}{(c+dx)^2}}}{2d^4}$$

Mathematica [A]
time = 0.24, size = 243, normalized size = 0.75

$$-\frac{c(6a^2bcd^2-4a^3d^3-4ab^2d(c^2+2e)+b^3(c^3+7ce))\,e^{\frac{e}{(c+dx)^2}}}{4d^4} + \frac{de^{\frac{e}{(c+dx)^2}}x(4a^3d^3+6a^2bd^3x+4ab^2d(2e+d^2x^2)+b^3(-6ce+dex+d^3x^3))+4(bc-ad)\sqrt{e}\,(-2abcd+a^2d^2+b^2(c^2+2e))\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{e}}{c+dx}\right)-be(-12abcd+6a^2d^2+b^2(6c^2+e))\,\mathrm{Ei}\left(\frac{e}{(c+dx)^2}\right)}{4d^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x)^2)*(a + b*x)^3,x]
```

```
[Out] -1/4*(c*(6*a^2*b*c*d^2 - 4*a^3*d^3 - 4*a*b^2*d*(c^2 + 2*e) + b^3*(c^3 + 7*c
*e))*E^(e/(c + d*x)^2))/d^4 + (d*E^(e/(c + d*x)^2)*x*(4*a^3*d^3 + 6*a^2*b*d
^3*x + 4*a*b^2*d*(2*e + d^2*x^2) + b^3*(-6*c*e + d*e*x + d^3*x^3)) + 4*(b*c
 - a*d)*Sqrt[e]*(-2*a*b*c*d + a^2*d^2 + b^2*(c^2 + 2*e))*Sqrt[Pi]*Erfi[Sqrt
[e]/(c + d*x)] - b*e*(-12*a*b*c*d + 6*a^2*d^2 + b^2*(6*c^2 + e))*ExpIntegra
lEi[e/(c + d*x)^2])/(4*d^4)
```

Maple [A]
time = 0.08, size = 560, normalized size = 1.74 Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(d*x+c)^2)*(b*x+a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/d*(a^3*(-(d*x+c)*exp(e/(d*x+c)^2)+e*Pi^(1/2)/(-e)^(1/2)*erf((-e)^(1/2)/(
d*x+c)))+b^3/d^3*(-1/4*(d*x+c)^4*exp(e/(d*x+c)^2)+1/2*e*(-1/2*exp(e/(d*x+c)
^2)*(d*x+c)^2-1/2*e*Ei(1,-e/(d*x+c)^2)))+3*b^2/d^2*a*(-1/3*(d*x+c)^3*exp(e/
(d*x+c)^2)+2/3*e*(-(d*x+c)*exp(e/(d*x+c)^2)+e*Pi^(1/2)/(-e)^(1/2)*erf((-e)^
```

```
(1/2)/(d*x+c))))-3*b^3/d^3*c*(-1/3*(d*x+c)^3*exp(e/(d*x+c)^2)+2/3*e*(-(d*x+
c)*exp(e/(d*x+c)^2)+e*Pi^(1/2)/(-e)^(1/2)*erf((-e)^(1/2)/(d*x+c))))+3*b/d*a
^2*(-1/2*exp(e/(d*x+c)^2)*(d*x+c)^2-1/2*e*Ei(1,-e/(d*x+c)^2))+3*b^3/d^3*c^2
*(-1/2*exp(e/(d*x+c)^2)*(d*x+c)^2-1/2*e*Ei(1,-e/(d*x+c)^2))-b^3/d^3*c^3*(-(
d*x+c)*exp(e/(d*x+c)^2)+e*Pi^(1/2)/(-e)^(1/2)*erf((-e)^(1/2)/(d*x+c)))-6*b^
2/d^2*c*a*(-1/2*exp(e/(d*x+c)^2)*(d*x+c)^2-1/2*e*Ei(1,-e/(d*x+c)^2))-3*b/d*
c*a^2*(-(d*x+c)*exp(e/(d*x+c)^2)+e*Pi^(1/2)/(-e)^(1/2)*erf((-e)^(1/2)/(d*x+
c)))+3*b^2/d^2*c^2*a*(-(d*x+c)*exp(e/(d*x+c)^2)+e*Pi^(1/2)/(-e)^(1/2)*erf((
-e)^(1/2)/(d*x+c))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)*(b*x+a)^3,x, algorithm="maxima")
```

```
[Out] 1/4*(b^3*d^3*x^4 + 4*a*b^2*d^3*x^3 + (6*a^2*b*d^3 + b^3*d*e)*x^2 + 2*(2*a^3
*d^3 - 3*b^3*c*e + 4*a*b^2*d*e)*x)*e^(e/(d^2*x^2 + 2*c*d*x + c^2))/d^3 + in
tegrate(1/2*(3*b^3*c^4*e - 4*a*b^2*c^3*d*e - (12*a*b^2*c*d^3*e - 6*a^2*b*d^
4*e - (6*c^2*d^2*e + d^2*e^2)*b^3)*x^2 + 2*(2*a^3*d^4*e - 2*(3*c^2*d^2*e -
2*d^2*e^2)*a*b^2 + (4*c^3*d*e - 3*c*d*e^2)*b^3)*x)*e^(e/(d^2*x^2 + 2*c*d*x
+ c^2))/(d^6*x^3 + 3*c*d^5*x^2 + 3*c^2*d^4*x + c^3*d^3), x)
```

Fricas [A]
time = 0.39, size = 309, normalized size = 0.96

$$\frac{4\sqrt{\pi}\,(b^3c^3d - 3\,ab^2c^2d^2 + 3\,a^2bcd^3 - a^3d^4 + 2\,(b^3cd - ab^2d^2)e)\sqrt{\frac{1}{d^2}}\,\mathrm{erfi}\left(\frac{d\sqrt{\frac{1}{d^2}}\,e^{\frac{1}{2}}}{dx+c}\right)e^{\frac{1}{2}} - (b^3e^2 + 6\,(b^3c^2 - 2\,ab^2cd + a^2bd^2)e)\mathrm{Ei}\left(\frac{e}{d^2x^2+2\,cdx+c^2}\right) + (b^3d^4x^4 + 4\,ab^2d^4x^3 + 6\,a^2bd^4x^2 + 4\,a^3d^4x - b^3c^4 + 4\,ab^2c^3d - 6\,a^2bc^2d^2 + 4\,a^3cd^3 + (b^3d^2x^2 - 7\,b^3c^2 + 8\,ab^2cd - 2\,(3\,b^3cd - 4\,ab^2d^2)x)e)e^{\left(\frac{e}{d^2x^2+2\,cdx+c^2}\right)}}{4\,d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)*(b*x+a)^3,x, algorithm="fricas")
```

```
[Out] 1/4*(4*sqrt(pi)*(b^3*c^3*d - 3*a*b^2*c^2*d^2 + 3*a^2*b*c*d^3 - a^3*d^4 + 2*
(b^3*c*d - a*b^2*d^2)*e)*sqrt(d^(-2))*erfi(d*sqrt(d^(-2))*e^(1/2)/(d*x + c)
)*e^(1/2) - (b^3*e^2 + 6*(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*e)*Ei(e/(d^2*x
^2 + 2*c*d*x + c^2)) + (b^3*d^4*x^4 + 4*a*b^2*d^4*x^3 + 6*a^2*b*d^4*x^2 + 4
*a^3*d^4*x - b^3*c^4 + 4*a*b^2*c^3*d - 6*a^2*b*c^2*d^2 + 4*a^3*c*d^3 + (b^3
*d^2*x^2 - 7*b^3*c^2 + 8*a*b^2*c*d - 2*(3*b^3*c*d - 4*a*b^2*d^2)*x)*e)*e^(e
/(d^2*x^2 + 2*c*d*x + c^2)))/d^4
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int (a+bx)^3\, e^{\frac{e}{c^2+2cdx+d^2x^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**2)*(b*x+a)**3,x)
```

```
[Out] Integral((a + b*x)**3*exp(e/(c**2 + 2*c*d*x + d**2*x**2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)*(b*x+a)^3,x, algorithm="giac")
```

```
[Out] integrate((b*x + a)^3*e^(e/(d*x + c)^2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{e}^{\frac{e}{(c+d\,x)^2}}\,{\left(a+b\,x\right)}^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^2)*(a + b*x)^3,x)
```

```
[Out] int(exp(e/(c + d*x)^2)*(a + b*x)^3, x)
```

3.410 $\int e^{\frac{e}{(c+dx)^2}}(a+bx)^2\,dx$

Optimal. Leaf size=215

$$\frac{(bc-ad)^2e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^3}+\frac{2b^2ee^{\frac{e}{(c+dx)^2}}(c+dx)}{3d^3}-\frac{b(bc-ad)e^{\frac{e}{(c+dx)^2}}(c+dx)^2}{d^3}+\frac{b^2e^{\frac{e}{(c+dx)^2}}(c+dx)^3}{3d^3}-\frac{(bc-ad)}{}$$

```
[Out] (-a*d+b*c)^2*exp(e/(d*x+c)^2)*(d*x+c)/d^3+2/3*b^2*e*exp(e/(d*x+c)^2)*(d*x+c
)/d^3-b*(-a*d+b*c)*exp(e/(d*x+c)^2)*(d*x+c)^2/d^3+1/3*b^2*exp(e/(d*x+c)^2)*
(d*x+c)^3/d^3+b*(-a*d+b*c)*e*Ei(e/(d*x+c)^2)/d^3-2/3*b^2*e^(3/2)*erfi(e^(1/
2)/(d*x+c))*Pi^(1/2)/d^3-(-a*d+b*c)^2*erfi(e^(1/2)/(d*x+c))*e^(1/2)*Pi^(1/2
)/d^3
```

Rubi [A]
time = 0.17, antiderivative size = 215, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.316$, Rules used = {2258, 2237, 2242, 2235, 2245, 2241}

$$-\frac{\sqrt{\pi}\sqrt{e}(bc-ad)^2\text{Erfi}\left(\frac{\sqrt{e}}{c+dx}\right)}{d^3}+\frac{be(bc-ad)\text{Ei}\left(\frac{e}{(c+dx)^2}\right)}{d^3}-\frac{b(c+dx)^2(bc-ad)e^{\frac{e}{(c+dx)^2}}}{d^3}+\frac{(c+dx)(bc-ad)^2e^{\frac{e}{(c+dx)^2}}}{d^3}-\frac{2\sqrt{\pi}b^2e^{3/2}\text{Erfi}\left(\frac{\sqrt{e}}{c+dx}\right)}{3d^3}+\frac{b^2(c+dx)^3e^{\frac{e}{(c+dx)^2}}}{3d^3}+\frac{2b^2e(c+dx)e^{\frac{e}{(c+dx)^2}}}{3d^3}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x)^2)*(a + b*x)^2,x]
```

```
[Out] ((b*c - a*d)^2*E^(e/(c + d*x)^2)*(c + d*x))/d^3 + (2*b^2*e*E^(e/(c + d*x)^2
)*(c + d*x))/(3*d^3) - (b*(b*c - a*d)*E^(e/(c + d*x)^2)*(c + d*x)^2)/d^3 +
(b^2*E^(e/(c + d*x)^2)*(c + d*x)^3)/(3*d^3) - ((b*c - a*d)^2*Sqrt[e]*Sqrt[P
i]*Erfi[Sqrt[e]/(c + d*x)])/d^3 - (2*b^2*e^(3/2)*Sqrt[Pi]*Erfi[Sqrt[e]/(c +
 d*x)])/(3*d^3) + (b*(b*c - a*d)*e*ExpIntegralEi[e/(c + d*x)^2])/d^3
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
```

```
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\begin{aligned}
\int e^{\frac{e}{(c+dx)^2}}(a+bx)^2\,dx &= \int \left(\frac{(-bc+ad)^2 e^{\frac{e}{(c+dx)^2}}}{d^2} - \frac{2b(bc-ad)e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^2} + \frac{b^2 e^{\frac{e}{(c+dx)^2}}(c+dx)^2}{d^2}\right) dx \\
&= \frac{b^2 \int e^{\frac{e}{(c+dx)^2}}(c+dx)^2\,dx}{d^2} - \frac{(2b(bc-ad))\int e^{\frac{e}{(c+dx)^2}}(c+dx)\,dx}{d^2} + \frac{(bc-ad)^2 \int e^{\frac{e}{(c+d}}}{d^2} \\
&= \frac{(bc-ad)^2 e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^3} - \frac{b(bc-ad)e^{\frac{e}{(c+dx)^2}}(c+dx)^2}{d^3} + \frac{b^2 e^{\frac{e}{(c+dx)^2}}(c+dx)^3}{3d^3} + \\
&= \frac{(bc-ad)^2 e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^3} + \frac{2b^2 e e^{\frac{e}{(c+dx)^2}}(c+dx)}{3d^3} - \frac{b(bc-ad)e^{\frac{e}{(c+dx)^2}}(c+dx)^2}{d^3} + \\
&= \frac{(bc-ad)^2 e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^3} + \frac{2b^2 e e^{\frac{e}{(c+dx)^2}}(c+dx)}{3d^3} - \frac{b(bc-ad)e^{\frac{e}{(c+dx)^2}}(c+dx)^2}{d^3} + \\
&= \frac{(bc-ad)^2 e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^3} + \frac{2b^2 e e^{\frac{e}{(c+dx)^2}}(c+dx)}{3d^3} - \frac{b(bc-ad)e^{\frac{e}{(c+dx)^2}}(c+dx)^2}{d^3} +
\end{aligned}$$

Mathematica [A]
time = 0.15, size = 176, normalized size = 0.82

$$\frac{c(-3abcd+3a^2d^2+b^2(c^2+2e))\,e^{\frac{e}{(c+dx)^2}}}{3d^3}+\frac{de^{\frac{e}{(c+dx)^2}}x(3a^2d^2+3abd^2x+b^2(2e+d^2x^2))-\sqrt{e}\,(-6abcd+3a^2d^2+b^2(3c^2+2e))\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{e}}{c+dx}\right)+3b(bc-ad)e\,\mathrm{Ei}\left(\frac{e}{(c+dx)^2}\right)}{3d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x)^2)*(a + b*x)^2,x]
```

```
[Out] (c*(-3*a*b*c*d + 3*a^2*d^2 + b^2*(c^2 + 2*e))*E^(e/(c + d*x)^2))/(3*d^3) +
(d*E^(e/(c + d*x)^2)*x*(3*a^2*d^2 + 3*a*b*d^2*x + b^2*(2*e + d^2*x^2)) - Sq
rt[e]*(-6*a*b*c*d + 3*a^2*d^2 + b^2*(3*c^2 + 2*e))*Sqrt[Pi]*Erfi[Sqrt[e]/(c
 + d*x)] + 3*b*(b*c - a*d)*e*ExpIntegralEi[e/(c + d*x)^2])/(3*d^3)
```

Maple [A]
time = 0.09, size = 313, normalized size = 1.46

method	result
derivativedivides	$-\frac{a^2\left(-(dx+c)\,\mathrm{e}^{\frac{e}{(dx+c)^2}}+\frac{e\sqrt{\pi}\,\mathrm{erf}\left(\frac{\sqrt{-e}}{dx+c}\right)}{\sqrt{-e}}\right)+\frac{b^2\left(-\frac{(dx+c)^3\mathrm{e}^{\frac{e}{(dx+c)^2}}}{3}+\frac{2e\left(-(dx+c)\,\mathrm{e}^{\frac{e}{(dx+c)^2}}+\frac{e\sqrt{\pi}\,\mathrm{erf}\left(\frac{\sqrt{-e}}{dx+c}\right)}{\sqrt{-e}}\right.}{3}\right.}{d^2}}{}$
default	$-\frac{a^2\left(-(dx+c)\,\mathrm{e}^{\frac{e}{(dx+c)^2}}+\frac{e\sqrt{\pi}\,\mathrm{erf}\left(\frac{\sqrt{-e}}{dx+c}\right)}{\sqrt{-e}}\right)+\frac{b^2\left(-\frac{(dx+c)^3\mathrm{e}^{\frac{e}{(dx+c)^2}}}{3}+\frac{2e\left(-(dx+c)\,\mathrm{e}^{\frac{e}{(dx+c)^2}}+\frac{e\sqrt{\pi}\,\mathrm{erf}\left(\frac{\sqrt{-e}}{dx+c}\right)}{\sqrt{-e}}\right.}{3}\right.}{d^2}}{}$
risch	$a^2\mathrm{e}^{\frac{e}{(dx+c)^2}}x+\frac{a^2\mathrm{e}^{\frac{e}{(dx+c)^2}}c}{d}-\frac{a^2e\sqrt{\pi}\,\mathrm{erf}\left(\frac{\sqrt{-e}}{dx+c}\right)}{d\sqrt{-e}}+\frac{b^2\mathrm{e}^{\frac{e}{(dx+c)^2}}x^3}{3}+\frac{b^2\mathrm{e}^{\frac{e}{(dx+c)^2}}c^3}{3d^3}+\frac{2b^2e\,\mathrm{e}^{\frac{e}{(dx+c)^2}}x}{3d^2}-$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(d*x+c)^2)*(b*x+a)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/d*(a^2*(-(d*x+c)*exp(e/(d*x+c)^2)+e*Pi^(1/2)/(-e)^(1/2)*erf((-e)^(1/2)/(
d*x+c)))+b^2/d^2*(-1/3*(d*x+c)^3*exp(e/(d*x+c)^2)+2/3*e*(-(d*x+c)*exp(e/(d*
```

```
x+c)^2)+e*Pi^(1/2)/(-e)^(1/2)*erf((-e)^(1/2)/(d*x+c))))+b^2/d^2*c^2*(-(d*x+
c)*exp(e/(d*x+c)^2)+e*Pi^(1/2)/(-e)^(1/2)*erf((-e)^(1/2)/(d*x+c)))+2*b/d*a*
(-1/2*exp(e/(d*x+c)^2)*(d*x+c)^2-1/2*e*Ei(1,-e/(d*x+c)^2))-2*b^2/d^2*c*(-1/
2*exp(e/(d*x+c)^2)*(d*x+c)^2-1/2*e*Ei(1,-e/(d*x+c)^2))-2*b/d*c*a*(-(d*x+c)*
exp(e/(d*x+c)^2)+e*Pi^(1/2)/(-e)^(1/2)*erf((-e)^(1/2)/(d*x+c))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)*(b*x+a)^2,x, algorithm="maxima")
```

```
[Out] 1/3*(b^2*d^2*x^3 + 3*a*b*d^2*x^2 + (3*a^2*d^2 + 2*b^2*e)*x)*e^(e/(d^2*x^2 +
 2*c*d*x + c^2))/d^2 + integrate(-2/3*(b^2*c^3*e + 3*(b^2*c*d^2*e - a*b*d^3
*e)*x^2 - (3*a^2*d^3*e - (3*c^2*d*e - 2*d*e^2)*b^2)*x)*e^(e/(d^2*x^2 + 2*c*
d*x + c^2))/(d^5*x^3 + 3*c*d^4*x^2 + 3*c^2*d^3*x + c^3*d^2), x)
```

Fricas [A]
time = 0.38, size = 199, normalized size = 0.93

$$-\frac{\sqrt{\pi}\,(3\,b^2c^2d-6\,abcd^2+3\,a^2d^3+2\,b^2de)\sqrt{\frac{1}{d^2}}\,\operatorname{erfi}\left(\frac{d\sqrt{\frac{1}{d^2}}\,e^{\frac{1}{2}}}{dx+c}\right)e^{\frac{1}{2}}-3\,(b^2c-abd)\operatorname{Ei}\left(\frac{e}{d^2x^2+2\,cdx+c^2}\right)e-(b^2d^3x^3+3\,abd^3x^2+3\,a^2d^3x+b^2c^3-3\,abc^2d+3\,a^2cd^2+2\,(b^2dx+b^2c)e)e^{\left(\frac{e}{d^2x^2+2\,cdx+c^2}\right)}}{3\,d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)*(b*x+a)^2,x, algorithm="fricas")
```

```
[Out] -1/3*(sqrt(pi)*(3*b^2*c^2*d - 6*a*b*c*d^2 + 3*a^2*d^3 + 2*b^2*d*e)*sqrt(d^(
-2))*erfi(d*sqrt(d^(-2))*e^(1/2)/(d*x + c))*e^(1/2) - 3*(b^2*c - a*b*d)*Ei(
e/(d^2*x^2 + 2*c*d*x + c^2))*e - (b^2*d^3*x^3 + 3*a*b*d^3*x^2 + 3*a^2*d^3*x
 + b^2*c^3 - 3*a*b*c^2*d + 3*a^2*c*d^2 + 2*(b^2*d*x + b^2*c)*e)*e^(e/(d^2*x
^2 + 2*c*d*x + c^2)))/d^3
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int (a+bx)^2\, e^{\frac{e}{c^2+2cdx+d^2x^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**2)*(b*x+a)**2,x)
```

```
[Out] Integral((a + b*x)**2*exp(e/(c**2 + 2*c*d*x + d**2*x**2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)*(b*x+a)^2,x, algorithm="giac")
[Out] integrate((b*x + a)^2*e^(e/(d*x + c)^2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int e^{\frac{e}{(c+d\,x)^2}}\,(a+b\,x)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^2)*(a + b*x)^2,x)
[Out] int(exp(e/(c + d*x)^2)*(a + b*x)^2, x)
```

3.411 $\int e^{\frac{e}{(c+dx)^2}}(a+bx)\,dx$

Optimal. Leaf size=111

$$-\frac{(bc-ad)e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^2}+\frac{be^{\frac{e}{(c+dx)^2}}(c+dx)^2}{2d^2}+\frac{(bc-ad)\sqrt{e}\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{e}}{c+dx}\right)}{d^2}-\frac{be\text{Ei}\left(\frac{e}{(c+dx)^2}\right)}{2d^2}$$

```
[Out] -(-a*d+b*c)*exp(e/(d*x+c)^2)*(d*x+c)/d^2+1/2*b*exp(e/(d*x+c)^2)*(d*x+c)^2/d
^2-1/2*b*e*Ei(e/(d*x+c)^2)/d^2+(-a*d+b*c)*erfi(e^(1/2)/(d*x+c))*e^(1/2)*Pi^
(1/2)/d^2
```

Rubi [A]
time = 0.09, antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.353$, Rules used = {2258, 2237, 2242, 2235, 2245, 2241}

$$\frac{\sqrt{\pi}\sqrt{e}(bc-ad)\text{Erfi}\left(\frac{\sqrt{e}}{c+dx}\right)}{d^2}-\frac{(c+dx)(bc-ad)e^{\frac{e}{(c+dx)^2}}}{d^2}-\frac{be\text{Ei}\left(\frac{e}{(c+dx)^2}\right)}{2d^2}+\frac{b(c+dx)^2e^{\frac{e}{(c+dx)^2}}}{2d^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x)^2)*(a + b*x),x]
```

```
[Out] -(((b*c - a*d)*E^(e/(c + d*x)^2)*(c + d*x))/d^2) + (b*E^(e/(c + d*x)^2)*(c
+ d*x)^2)/(2*d^2) + ((b*c - a*d)*Sqrt[e]*Sqrt[Pi]*Erfi[Sqrt[e]/(c + d*x)])/
d^2 - (b*e*ExpIntegralEi[e/(c + d*x)^2])/(2*d^2)
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int e^{\frac{e}{(c+dx)^2}}(a+bx)\,dx = \int \left(\frac{(-bc+ad)e^{\frac{e}{(c+dx)^2}}}{d}+\frac{be^{\frac{e}{(c+dx)^2}}(c+dx)}{d}\right)dx$$

$$= \frac{b\int e^{\frac{e}{(c+dx)^2}}(c+dx)\,dx}{d}+\frac{(-bc+ad)\int e^{\frac{e}{(c+dx)^2}}\,dx}{d}$$

$$= -\frac{(bc-ad)e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^2}+\frac{be^{\frac{e}{(c+dx)^2}}(c+dx)^2}{2d^2}+\frac{(be)\int \frac{e^{\frac{e}{(c+dx)^2}}}{c+dx}\,dx}{d}+\frac{(2(-bc+ad)e \cdots}{\cdots}$$

$$= -\frac{(bc-ad)e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^2}+\frac{be^{\frac{e}{(c+dx)^2}}(c+dx)^2}{2d^2}-\frac{be\mathrm{Ei}\left(\frac{e}{(c+dx)^2}\right)}{2d^2}+\frac{(2(bc-ad)e)\mathrm{Sub}\cdots}{\cdots}$$

$$= -\frac{(bc-ad)e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^2}+\frac{be^{\frac{e}{(c+dx)^2}}(c+dx)^2}{2d^2}+\frac{(bc-ad)\sqrt{e}\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{e}}{c+dx}\right)}{d^2}-\frac{b\cdots}{\cdots}$$

Mathematica [A]
time = 0.08, size = 85, normalized size = 0.77

$$-\frac{e^{\frac{e}{(c+dx)^2}}(c+dx)(bc-2ad-bdx)+2(-bc+ad)\sqrt{e}\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{e}}{c+dx}\right)+be\mathrm{Ei}\left(\frac{e}{(c+dx)^2}\right)}{2d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x)^2)*(a + b*x),x]
```

```
[Out] -1/2*(E^(e/(c + d*x)^2)*(c + d*x)*(b*c - 2*a*d - b*d*x) + 2*(-(b*c) + a*d)*
Sqrt[e]*Sqrt[Pi]*Erfi[Sqrt[e]/(c + d*x)] + b*e*ExpIntegralEi[e/(c + d*x)^2]
)/d^2
```

Maple [A]
time = 0.02, size = 140, normalized size = 1.26

method	result
derivativedivides	$-\frac{a\left(-(dx+c)\mathrm{e}^{\frac{e}{(dx+c)^2}}+\frac{e\sqrt{\pi}\,\mathrm{erf}\left(\frac{\sqrt{-e}}{dx+c}\right)}{\sqrt{-e}}\right)+\frac{b\left(-\frac{\mathrm{e}^{\frac{e}{(dx+c)^2}}(dx+c)^2}{2}-\frac{e\,\mathrm{expIntegral}\left(1,-\frac{e}{(dx+c)^2}\right)}{2}\right)}{d}-\frac{bc\left(-(dx+c)\mathrm{e}\right.}{}}{d}$
default	$-\frac{a\left(-(dx+c)\mathrm{e}^{\frac{e}{(dx+c)^2}}+\frac{e\sqrt{\pi}\,\mathrm{erf}\left(\frac{\sqrt{-e}}{dx+c}\right)}{\sqrt{-e}}\right)+\frac{b\left(-\frac{\mathrm{e}^{\frac{e}{(dx+c)^2}}(dx+c)^2}{2}-\frac{e\,\mathrm{expIntegral}\left(1,-\frac{e}{(dx+c)^2}\right)}{2}\right)}{d}-\frac{bc\left(-(dx+c)\mathrm{e}\right.}{}}{d}$
risch	$a\,\mathrm{e}^{\frac{e}{(dx+c)^2}}x+\frac{a\,\mathrm{e}^{\frac{e}{(dx+c)^2}}c}{d}-\frac{ae\sqrt{\pi}\,\mathrm{erf}\left(\frac{\sqrt{-e}}{dx+c}\right)}{d\sqrt{-e}}+\frac{b\,\mathrm{e}^{\frac{e}{(dx+c)^2}}x^2}{2}-\frac{b\,\mathrm{e}^{\frac{e}{(dx+c)^2}}c^2}{2d^2}+\frac{be\,\mathrm{expIntegral}\left(1,-\right.}{2d^2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(d*x+c)^2)*(b*x+a),x,method=_RETURNVERBOSE)
```

```
[Out] -1/d*(a*(-(d*x+c)*exp(e/(d*x+c)^2)+e*Pi^(1/2)/(-e)^(1/2)*erf((-e)^(1/2)/(d*
x+c)))+b/d*(-1/2*exp(e/(d*x+c)^2)*(d*x+c)^2-1/2*e*Ei(1,-e/(d*x+c)^2))-b/d*c
*(-(d*x+c)*exp(e/(d*x+c)^2)+e*Pi^(1/2)/(-e)^(1/2)*erf((-e)^(1/2)/(d*x+c))))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)*(b*x+a),x, algorithm="maxima")
```

```
[Out] 1/2*(b*x^2 + 2*a*x)*e^(e/(d^2*x^2 + 2*c*d*x + c^2)) + integrate((b*d*e*x^2
+ 2*a*d*e*x)*e^(e/(d^2*x^2 + 2*c*d*x + c^2))/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2
*d*x + c^3), x)
```

Fricas [A]
time = 0.40, size = 123, normalized size = 1.11

$$\frac{2\sqrt{\pi}\left(bcd-ad^2\right)\sqrt{\frac{1}{d^2}}\operatorname{erfi}\left(\frac{d\sqrt{\frac{1}{d^2}}e^{\frac{1}{2}}}{dx+c}\right)e^{\frac{1}{2}}-b\mathrm{Ei}\left(\frac{e}{d^2x^2+2\,cdx+c^2}\right)e+\left(bd^2x^2+2\,ad^2x-bc^2+2\,acd\right)e^{\left(\frac{e}{d^2x^2+2\,cdx+c^2}\right)}}{2\,d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)*(b*x+a),x, algorithm="fricas")
```

```
[Out] 1/2*(2*sqrt(pi)*(b*c*d - a*d^2)*sqrt(d^(-2))*erfi(d*sqrt(d^(-2))*e^(1/2)/(d
*x + c))*e^(1/2) - b*Ei(e/(d^2*x^2 + 2*c*d*x + c^2))*e + (b*d^2*x^2 + 2*a*d
^2*x - b*c^2 + 2*a*c*d)*e^(e/(d^2*x^2 + 2*c*d*x + c^2)))/d^2
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int(a+bx)\,e^{\frac{e}{c^2+2cdx+d^2x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**2)*(b*x+a),x)
```

```
[Out] Integral((a + b*x)*exp(e/(c**2 + 2*c*d*x + d**2*x**2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)*(b*x+a),x, algorithm="giac")
```

```
[Out] integrate((b*x + a)*e^(e/(d*x + c)^2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{e}^{\frac{e}{(c+d\,x)^2}}\,(a+b\,x)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^2)*(a + b*x),x)
```

```
[Out] int(exp(e/(c + d*x)^2)*(a + b*x), x)
```

3.412 $\int e^{\frac{e}{(c+dx)^2}}\,dx$

Optimal. Leaf size=50

$$\frac{e^{\frac{e}{(c+dx)^2}}(c+dx)}{d}-\frac{\sqrt{e}\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{e}}{c+dx}\right)}{d}$$

```
[Out] exp(e/(d*x+c)^2)*(d*x+c)/d-erfi(e^(1/2)/(d*x+c))*e^(1/2)*Pi^(1/2)/d
```

Rubi [A]
time = 0.03, antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {2237, 2242, 2235}

$$\frac{(c+dx)e^{\frac{e}{(c+dx)^2}}}{d}-\frac{\sqrt{\pi}\,\sqrt{e}\,\mathrm{Erfi}\left(\frac{\sqrt{e}}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x)^2),x]
```

```
[Out] (E^(e/(c + d*x)^2)*(c + d*x))/d - (Sqrt[e]*Sqrt[Pi]*Erfi[Sqrt[e]/(c + d*x)]
)/d
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(c +
d*x)*(F^(a + b*(c + d*x)^n)/d), x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2242

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rubi steps

$$\int e^{\frac{e}{(c+dx)^2}}\,dx=\frac{e^{\frac{e}{(c+dx)^2}}(c+dx)}{d}+(2e)\int\frac{e^{\frac{e}{(c+dx)^2}}}{(c+dx)^2}\,dx$$
$$=\frac{e^{\frac{e}{(c+dx)^2}}(c+dx)}{d}-\frac{(2e)\text{Subst}\left(\int e^{ex^2}\,dx,x,\frac{1}{c+dx}\right)}{d}$$
$$=\frac{e^{\frac{e}{(c+dx)^2}}(c+dx)}{d}-\frac{\sqrt{e}\,\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{e}}{c+dx}\right)}{d}$$

Mathematica [A]
time = 0.01, size = 50, normalized size = 1.00

$$\frac{e^{\frac{e}{(c+dx)^2}}(c+dx)}{d}-\frac{\sqrt{e}\,\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{e}}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x)^2),x]
```

```
[Out] (E^(e/(c + d*x)^2)*(c + d*x))/d - (Sqrt[e]*Sqrt[Pi]*Erfi[Sqrt[e]/(c + d*x)]
)/d
```

Maple [A]
time = 0.01, size = 48, normalized size = 0.96

method	result	size
derivativedivides	$-\frac{-(dx+c)\,\mathrm{e}^{\frac{e}{(dx+c)^2}}+\frac{e\sqrt{\pi}\,\operatorname{erf}\left(\frac{\sqrt{-e}}{dx+c}\right)}{\sqrt{-e}}}{d}$	48
default	$-\frac{-(dx+c)\,\mathrm{e}^{\frac{e}{(dx+c)^2}}+\frac{e\sqrt{\pi}\,\operatorname{erf}\left(\frac{\sqrt{-e}}{dx+c}\right)}{\sqrt{-e}}}{d}$	48
risch	$\mathrm{e}^{\frac{e}{(dx+c)^2}}x+\frac{\mathrm{e}^{\frac{e}{(dx+c)^2}}c}{d}-\frac{e\sqrt{\pi}\,\operatorname{erf}\left(\frac{\sqrt{-e}}{dx+c}\right)}{d\sqrt{-e}}$	57

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(d*x+c)^2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/d*(-(d*x+c)*exp(e/(d*x+c)^2)+e*Pi^(1/2)/(-e)^(1/2)*erf((-e)^(1/2)/(d*x+c
)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2),x, algorithm="maxima")
```

```
[Out] 2*d*e*integrate(x*e^(e/(d^2*x^2 + 2*c*d*x + c^2))/(d^3*x^3 + 3*c*d^2*x^2 +
3*c^2*d*x + c^3), x) + x*e^(e/(d^2*x^2 + 2*c*d*x + c^2))
```

Fricas [A]
time = 0.40, size = 64, normalized size = 1.28

$$-\frac{\sqrt{\pi}\, d\sqrt{\frac{1}{d^2}}\, \operatorname{erfi}\left(\frac{d\sqrt{\frac{1}{d^2}}\, e^{\frac{1}{2}}}{dx+c}\right) e^{\frac{1}{2}} - (dx+c)e^{\left(\frac{e}{d^2x^2+2\, cdx+c^2}\right)}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2),x, algorithm="fricas")
```

```
[Out] -(sqrt(pi)*d*sqrt(d^(-2))*erfi(d*sqrt(d^(-2))*e^(1/2)/(d*x + c))*e^(1/2) -
(d*x + c)*e^(e/(d^2*x^2 + 2*c*d*x + c^2)))/d
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int e^{\frac{e}{(c+dx)^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**2),x)
```

```
[Out] Integral(exp(e/(c + d*x)**2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2),x, algorithm="giac")
```

```
[Out] integrate(e^(e/(d*x + c)^2), x)
```

Mupad [B]
time = 3.69, size = 43, normalized size = 0.86

$$\frac{e^{\frac{e}{(c+d\,x)^2}}\,(c+d\,x)}{d}-\frac{\sqrt{e}\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{e}}{c+d\,x}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^2),x)
[Out] (exp(e/(c + d*x)^2)*(c + d*x))/d - (e^(1/2)*pi^(1/2)*erfi(e^(1/2)/(c + d*x)
))/d
```

3.413 $\int \frac{e^{\frac{e}{(c+dx)^2}}}{a+bx}\,dx$

Optimal. Leaf size=22

$$\operatorname{Int}\left(\frac{e^{\frac{e}{(c+dx)^2}}}{a+bx},x\right)$$

[Out] Unintegrable(exp(e/(d*x+c)^2)/(b*x+a),x)

Rubi [A]
time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{e^{\frac{e}{(c+dx)^2}}}{a+bx}\,dx$$

Verification is not applicable to the result.

[In] Int[E^(e/(c + d*x)^2)/(a + b*x),x]

[Out] Defer[Int][E^(e/(c + d*x)^2)/(a + b*x), x]

Rubi steps

$$\int \frac{e^{\frac{e}{(c+dx)^2}}}{a+bx}\,dx=\int \frac{e^{\frac{e}{(c+dx)^2}}}{a+bx}\,dx$$

Mathematica [A]
time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{(c+dx)^2}}}{a+bx}\,dx$$

Verification is not applicable to the result.

[In] Integrate[E^(e/(c + d*x)^2)/(a + b*x),x]

[Out] Integrate[E^(e/(c + d*x)^2)/(a + b*x), x]

Maple [A]
time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{(dx+c)^2}}}{bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(d*x+c)^2)/(b*x+a),x)
```

```
[Out] int(exp(e/(d*x+c)^2)/(b*x+a),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)/(b*x+a),x, algorithm="maxima")
```

```
[Out] integrate(e^(e/(d*x + c)^2)/(b*x + a), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)/(b*x+a),x, algorithm="fricas")
```

```
[Out] integral(e^(e/(d^2*x^2 + 2*c*d*x + c^2))/(b*x + a), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{c^2+2cdx+d^2x^2}}}{a+bx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**2)/(b*x+a),x)
```

```
[Out] Integral(exp(e/(c**2 + 2*c*d*x + d**2*x**2))/(a + b*x), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)/(b*x+a),x, algorithm="giac")
```

```
[Out] integrate(e^(e/(d*x + c)^2)/(b*x + a), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{\mathrm{e}^{\frac{e}{(c+d\,x)^2}}}{a+b\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^2)/(a + b*x),x)
[Out] int(exp(e/(c + d*x)^2)/(a + b*x), x)
```

3.414 $\int \frac{e^{\frac{e}{(c+dx)^2}}}{(a+bx)^2}\,dx$

Optimal. Leaf size=22

$$\text{Int}\left(\frac{e^{\frac{e}{(c+dx)^2}}}{(a+bx)^2},x\right)$$

```
[Out] CannotIntegrate(exp(e/(d*x+c)^2)/(b*x+a)^2,x)
```

Rubi [A]
time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{e^{\frac{e}{(c+dx)^2}}}{(a+bx)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[E^(e/(c + d*x)^2)/(a + b*x)^2,x]
[Out] Defer[Int][E^(e/(c + d*x)^2)/(a + b*x)^2, x]
```

Rubi steps

$$\int \frac{e^{\frac{e}{(c+dx)^2}}}{(a+bx)^2}\,dx=\int \frac{e^{\frac{e}{(c+dx)^2}}}{(a+bx)^2}\,dx$$

Mathematica [A]
time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{(c+dx)^2}}}{(a+bx)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[E^(e/(c + d*x)^2)/(a + b*x)^2,x]
[Out] Integrate[E^(e/(c + d*x)^2)/(a + b*x)^2, x]
```

Maple [A]
time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{(dx+c)^2}}}{(bx+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(exp(e/(d*x+c)^2)/(b*x+a)^2,x)

[Out] int(exp(e/(d*x+c)^2)/(b*x+a)^2,x)

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(exp(e/(d*x+c)^2)/(b*x+a)^2,x, algorithm="maxima")

[Out] integrate(e^(e/(d*x + c)^2)/(b*x + a)^2, x)

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(exp(e/(d*x+c)^2)/(b*x+a)^2,x, algorithm="fricas")

[Out] integral(e^(e/(d^2*x^2 + 2*c*d*x + c^2))/(b^2*x^2 + 2*a*b*x + a^2), x)

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{c^2+2cdx+d^2x^2}}}{(a+bx)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(exp(e/(d*x+c)**2)/(b*x+a)**2,x)

[Out] Integral(exp(e/(c**2 + 2*c*d*x + d**2*x**2))/(a + b*x)**2, x)

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(exp(e/(d*x+c)^2)/(b*x+a)^2,x, algorithm="giac")

[Out] undef

Mupad [A]
time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{\mathrm{e}^{\frac{e}{(c+d\,x)^2}}}{\left(a+b\,x\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^2)/(a + b*x)^2,x)
```

```
[Out] int(exp(e/(c + d*x)^2)/(a + b*x)^2, x)
```

3.415 $\int \frac{e^{\frac{e}{(c+dx)^2}}}{(a+bx)^3}\,dx$

Optimal. Leaf size=22

$$\operatorname{Int}\left(\frac{e^{\frac{e}{(c+dx)^2}}}{(a+bx)^3},x\right)$$

```
[Out] CannotIntegrate(exp(e/(d*x+c)^2)/(b*x+a)^3,x)
```

Rubi [A]
time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{e^{\frac{e}{(c+dx)^2}}}{(a+bx)^3}\,dx$$

Verification is not applicable to the result.

```
[In] Int[E^(e/(c + d*x)^2)/(a + b*x)^3,x]
[Out] Defer[Int][E^(e/(c + d*x)^2)/(a + b*x)^3, x]
```

Rubi steps

$$\int \frac{e^{\frac{e}{(c+dx)^2}}}{(a+bx)^3}\,dx = \int \frac{e^{\frac{e}{(c+dx)^2}}}{(a+bx)^3}\,dx$$

Mathematica [A]
time = 0.06, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{(c+dx)^2}}}{(a+bx)^3}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[E^(e/(c + d*x)^2)/(a + b*x)^3,x]
[Out] Integrate[E^(e/(c + d*x)^2)/(a + b*x)^3, x]
```

Maple [A]
time = 0.05, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{e}^{\frac{e}{(dx+c)^2}}}{(bx+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(d*x+c)^2)/(b*x+a)^3,x)
```

```
[Out] int(exp(e/(d*x+c)^2)/(b*x+a)^3,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)/(b*x+a)^3,x, algorithm="maxima")
```

```
[Out] integrate(e^(e/(d*x + c)^2)/(b*x + a)^3, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)/(b*x+a)^3,x, algorithm="fricas")
```

```
[Out] integral(e^(e/(d^2*x^2 + 2*c*d*x + c^2))/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x
 + a^3), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**2)/(b*x+a)**3,x)
```

```
[Out] Timed out
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)/(b*x+a)^3,x, algorithm="giac")
```

```
[Out] integrate(e^(e/(d*x + c)^2)/(b*x + a)^3, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{e^{\frac{e}{(c+d\,x)^2}}}{(a+b\,x)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^2)/(a + b*x)^3,x)
[Out] int(exp(e/(c + d*x)^2)/(a + b*x)^3, x)
```

3.416 $\int e^{\frac{e}{(c+dx)^3}}(a+bx)^3\,dx$

Optimal. Leaf size=206

$$-\frac{b^2(bc-ad)e^{\frac{e}{(c+dx)^3}}(c+dx)^3}{d^4}+\frac{b^2(bc-ad)e\text{Ei}\left(\frac{e}{(c+dx)^3}\right)}{d^4}+\frac{b^3\left(-\frac{e}{(c+dx)^3}\right)^{4/3}(c+dx)^4\Gamma\left(-\frac{4}{3},-\frac{e}{(c+dx)^3}\right)}{3d^4}+\frac{b(bc-$$

```
[Out] -b^2*(-a*d+b*c)*exp(e/(d*x+c)^3)*(d*x+c)^3/d^4+b^2*(-a*d+b*c)*e*Ei(e/(d*x+c
)^3)/d^4+1/3*b^3*(-e/(d*x+c)^3)^(4/3)*(d*x+c)^4*GAMMA(-4/3,-e/(d*x+c)^3)/d^
4+b*(-a*d+b*c)^2*(-e/(d*x+c)^3)^(2/3)*(d*x+c)^2*GAMMA(-2/3,-e/(d*x+c)^3)/d^
4-1/3*(-a*d+b*c)^3*(-e/(d*x+c)^3)^(1/3)*(d*x+c)*GAMMA(-1/3,-e/(d*x+c)^3)/d^
4
```

Rubi [A]

time = 0.13, antiderivative size = 206, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.263$, Rules used = {2258, 2239, 2250, 2245, 2241}

$$\frac{b(c+dx)^2(bc-ad)^2\left(-\frac{e}{(c+dx)^3}\right)^{2/3}\text{Gamma}\left(-\frac{2}{3},-\frac{e}{(c+dx)^3}\right)}{d^4}-\frac{(c+dx)(bc-ad)^3\sqrt[3]{-\frac{e}{(c+dx)^3}}\text{Gamma}\left(-\frac{1}{3},-\frac{e}{(c+dx)^3}\right)}{3d^4}+\frac{b^3(c+dx)^4\left(-\frac{e}{(c+dx)^3}\right)^{4/3}\text{Gamma}\left(-\frac{4}{3},-\frac{e}{(c+dx)^3}\right)}{3d^4}+\frac{b^2e(bc-ad)\text{Ei}\left(\frac{e}{(c+dx)^3}\right)}{d^4}-\frac{b^2(c+dx)^3(bc-ad)e^{\frac{e}{(c+dx)^3}}}{d^4}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x)^3)*(a + b*x)^3,x]
```

```
[Out] -((b^2*(b*c - a*d)*E^(e/(c + d*x)^3)*(c + d*x)^3)/d^4) + (b^2*(b*c - a*d)*e
*ExpIntegralEi[e/(c + d*x)^3])/d^4 + (b^3*(-(e/(c + d*x)^3))^(4/3)*(c + d*x
)^4*Gamma[-4/3, -(e/(c + d*x)^3)])/(3*d^4) + (b*(b*c - a*d)^2*(-(e/(c + d*x
)^3))^(2/3)*(c + d*x)^2*Gamma[-2/3, -(e/(c + d*x)^3)])/d^4 - ((b*c - a*d)^3
*(-(e/(c + d*x)^3))^(1/3)*(c + d*x)*Gamma[-1/3, -(e/(c + d*x)^3)])/(3*d^4)
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
```

```
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\begin{aligned}
\int e^{\frac{e}{(c+dx)^3}}(a+bx)^3\,dx &= \int \left(\frac{(-bc+ad)^3 e^{\frac{e}{(c+dx)^3}}}{d^3} + \frac{3b(bc-ad)^2 e^{\frac{e}{(c+dx)^3}}(c+dx)}{d^3} - \frac{3b^2(bc-ad)e^{\frac{e}{(c+dx)^3}}(c+\right.\\
&= \frac{b^3\int e^{\frac{e}{(c+dx)^3}}(c+dx)^3\,dx}{d^3} - \frac{(3b^2(bc-ad))\int e^{\frac{e}{(c+dx)^3}}(c+dx)^2\,dx}{d^3} + \frac{(3b(bc-ad)^2)\int}{}\\
&= -\frac{b^2(bc-ad)e^{\frac{e}{(c+dx)^3}}(c+dx)^3}{d^4} + \frac{b^3\left(-\frac{e}{(c+dx)^3}\right)^{4/3}(c+dx)^4\Gamma\left(-\frac{4}{3},-\frac{e}{(c+dx)^3}\right)}{3d^4} + \frac{b(b}{}\\
&= -\frac{b^2(bc-ad)e^{\frac{e}{(c+dx)^3}}(c+dx)^3}{d^4} + \frac{b^2(bc-ad)e\,\text{Ei}\left(\frac{e}{(c+dx)^3}\right)}{d^4} + \frac{b^3\left(-\frac{e}{(c+dx)^3}\right)^{4/3}(c+}{3d}
\end{aligned}$$

Mathematica [A]

time = 0.10, size = 195, normalized size = 0.95

$$\frac{-3b^2(bc-ad)e^{\frac{e}{(c+dx)^3}}(c+dx)^3+3b^2(bc-ad)e\,\text{Ei}\left(\frac{e}{(c+dx)^3}\right)+b^3\left(-\frac{e}{(c+dx)^3}\right)^{4/3}(c+dx)^4\Gamma\left(-\frac{4}{3},-\frac{e}{(c+dx)^3}\right)+3b(bc-ad)^2\left(-\frac{e}{(c+dx)^3}\right)^{2/3}(c+dx)^2\Gamma\left(-\frac{2}{3},-\frac{e}{(c+dx)^3}\right)-(bc-ad)^3\sqrt[3]{-\frac{e}{(c+dx)^3}}(c+dx)\Gamma\left(-\frac{1}{3},-\frac{e}{(c+dx)^3}\right)}{3d^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x)^3)*(a + b*x)^3,x]
```

```
[Out] (-3*b^2*(b*c - a*d)*E^(e/(c + d*x)^3)*(c + d*x)^3 + 3*b^2*(b*c - a*d)*e*Exp
IntegralEi[e/(c + d*x)^3] + b^3*(-(e/(c + d*x)^3))^(4/3)*(c + d*x)^4*Gamma[
```

```
-4/3, -(e/(c + d*x)^3)] + 3*b*(b*c - a*d)^2*(-(e/(c + d*x)^3))^(2/3)*(c + d
*x)^2*Gamma[-2/3, -(e/(c + d*x)^3)] - (b*c - a*d)^3*(-(e/(c + d*x)^3))^(1/3
)*(c + d*x)*Gamma[-1/3, -(e/(c + d*x)^3)])/(3*d^4)
```

Maple [F]
time = 0.03, size = 0, normalized size = 0.00

$$\int e^{\frac{e}{(dx+c)^3}} (bx+a)^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(d*x+c)^3)*(b*x+a)^3,x)
```

```
[Out] int(exp(e/(d*x+c)^3)*(b*x+a)^3,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)*(b*x+a)^3,x, algorithm="maxima")
```

```
[Out] 1/4*(b^3*d^3*x^4 + 4*a*b^2*d^3*x^3 + 6*a^2*b*d^3*x^2 + (4*a^3*d^3 + 3*b^3*e
)*x)*e^(e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/d^3 + integrate(-3/4*(
b^3*c^4*e + 4*(b^3*c*d^3*e - a*b^2*d^4*e)*x^3 + 6*(b^3*c^2*d^2*e - a^2*b*d^
4*e)*x^2 - (4*a^3*d^4*e - (4*c^3*d*e - 3*d*e^2)*b^3)*x)*e^(e/(d^3*x^3 + 3*c
*d^2*x^2 + 3*c^2*d*x + c^3))/(d^7*x^4 + 4*c*d^6*x^3 + 6*c^2*d^5*x^2 + 4*c^3
*d^4*x + c^4*d^3), x)
```

Fricas [A]
time = 0.12, size = 357, normalized size = 1.73

$$\frac{4\,(b^3c-ab^2d)\mathrm{Ei}\left(\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)e-6\,(b^3c^2d^2-2\,ab^2cd^3+a^2bd^4)\left(-\frac{e}{d^3}\right)^{\frac{2}{3}}\Gamma\left(\frac{1}{3},-\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)+(4\,b^3c^3d-12\,ab^2c^2d^2+12\,a^2bcd^3-4\,a^3d^4-3\,b^3de)\left(-\frac{e}{d^3}\right)^{\frac{1}{3}}\Gamma\left(\frac{2}{3},-\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)+(b^3d^4x^4+4\,ab^2d^4x^3+6\,a^2bd^4x^2+4\,a^3d^4x-b^3c^4+4\,ab^2c^3d-6\,a^2bc^2d^2+4\,a^3cd^3+3\,(b^3dx+b^3c)e)e^{\left(\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)}}{4\,d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)*(b*x+a)^3,x, algorithm="fricas")
```

```
[Out] 1/4*(4*(b^3*c - a*b^2*d)*Ei(e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))*e
- 6*(b^3*c^2*d^2 - 2*a*b^2*c*d^3 + a^2*b*d^4)*(-e/d^3)^(2/3)*gamma(1/3, -e/
(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)) + (4*b^3*c^3*d - 12*a*b^2*c^2*d^
2 + 12*a^2*b*c*d^3 - 4*a^3*d^4 - 3*b^3*d*e)*(-e/d^3)^(1/3)*gamma(2/3, -e/(d
^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)) + (b^3*d^4*x^4 + 4*a*b^2*d^4*x^3 +
 6*a^2*b*d^4*x^2 + 4*a^3*d^4*x - b^3*c^4 + 4*a*b^2*c^3*d - 6*a^2*b*c^2*d^2
+ 4*a^3*c*d^3 + 3*(b^3*d*x + b^3*c)*e)*e^(e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*
d*x + c^3)))/d^4
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int (a+bx)^3 e^{\frac{e}{c^3+3c^2dx+3cd^2x^2+d^3x^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**3)*(b*x+a)**3,x)
[Out] Integral((a + b*x)**3*exp(e/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3)
), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)*(b*x+a)^3,x, algorithm="giac")
[Out] integrate((b*x + a)^3*e^(e/(d*x + c)^3), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{e}^{\frac{e}{(c+d\,x)^3}}\,(a+b\,x)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^3)*(a + b*x)^3,x)
[Out] int(exp(e/(c + d*x)^3)*(a + b*x)^3, x)
```

3.417 $\int e^{\frac{e}{(c+dx)^3}}(a+bx)^2\,dx$

Optimal. Leaf size=151

$$\frac{b^2e^{\frac{e}{(c+dx)^3}}(c+dx)^3}{3d^3}-\frac{b^2e\text{Ei}\left(\frac{e}{(c+dx)^3}\right)}{3d^3}-\frac{2b(bc-ad)\left(-\frac{e}{(c+dx)^3}\right)^{2/3}(c+dx)^2\Gamma\left(-\frac{2}{3},-\frac{e}{(c+dx)^3}\right)}{3d^3}+\frac{(bc-ad)^2\sqrt[3]{-\frac{e}{(c+dx)^3}}\cdots}{\cdots}$$

```
[Out] 1/3*b^2*exp(e/(d*x+c)^3)*(d*x+c)^3/d^3-1/3*b^2*e*Ei(e/(d*x+c)^3)/d^3-2/3*b*
(-a*d+b*c)*(-e/(d*x+c)^3)^(2/3)*(d*x+c)^2*GAMMA(-2/3,-e/(d*x+c)^3)/d^3+1/3*
(-a*d+b*c)^2*(-e/(d*x+c)^3)^(1/3)*(d*x+c)*GAMMA(-1/3,-e/(d*x+c)^3)/d^3
```

Rubi [A]
time = 0.11, antiderivative size = 151, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.263$, Rules used = {2258, 2239, 2250, 2245, 2241}

$$-\frac{2b(c+dx)^2(bc-ad)\left(-\frac{e}{(c+dx)^3}\right)^{2/3}\text{Gamma}\left(-\frac{2}{3},-\frac{e}{(c+dx)^3}\right)}{3d^3}+\frac{(c+dx)(bc-ad)^2\sqrt[3]{-\frac{e}{(c+dx)^3}}\text{Gamma}\left(-\frac{1}{3},-\frac{e}{(c+dx)^3}\right)}{3d^3}-\frac{b^2e\text{Ei}\left(\frac{e}{(c+dx)^3}\right)}{3d^3}+\frac{b^2(c+dx)^3e^{\frac{e}{(c+dx)^3}}}{3d^3}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x)^3)*(a + b*x)^2,x]
```

```
[Out] (b^2*E^(e/(c + d*x)^3)*(c + d*x)^3)/(3*d^3) - (b^2*e*ExpIntegralEi[e/(c + d
*x)^3])/(3*d^3) - (2*b*(b*c - a*d)*(-(e/(c + d*x)^3))^(2/3)*(c + d*x)^2*Gam
ma[-2/3, -(e/(c + d*x)^3)])/(3*d^3) + ((b*c - a*d)^2*(-(e/(c + d*x)^3))^(1/
3)*(c + d*x)*Gamma[-1/3, -(e/(c + d*x)^3)])/(3*d^3)
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
```

```
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\begin{aligned}\int e^{\frac{e}{(c+dx)^3}}(a+bx)^2\,dx &= \int\left(\frac{(-bc+ad)^2e^{\frac{e}{(c+dx)^3}}}{d^2}-\frac{2b(bc-ad)e^{\frac{e}{(c+dx)^3}}(c+dx)}{d^2}+\frac{b^2e^{\frac{e}{(c+dx)^3}}(c+dx)^2}{d^2}\right)dx\\ &= \frac{b^2\int e^{\frac{e}{(c+dx)^3}}(c+dx)^2\,dx}{d^2}-\frac{(2b(bc-ad))\int e^{\frac{e}{(c+dx)^3}}(c+dx)\,dx}{d^2}+\frac{(bc-ad)^2\int e^{\frac{e}{(c+d}}}{d^2}\\ &= \frac{b^2e^{\frac{e}{(c+dx)^3}}(c+dx)^3}{3d^3}-\frac{2b(bc-ad)\left(-\frac{e}{(c+dx)^3}\right)^{2/3}(c+dx)^2\Gamma\left(-\frac{2}{3},-\frac{e}{(c+dx)^3}\right)}{3d^3}+\frac{(bc-}{}\\ &= \frac{b^2e^{\frac{e}{(c+dx)^3}}(c+dx)^3}{3d^3}-\frac{b^2e\text{Ei}\left(\frac{e}{(c+dx)^3}\right)}{3d^3}-\frac{2b(bc-ad)\left(-\frac{e}{(c+dx)^3}\right)^{2/3}(c+dx)^2\Gamma\left(-\frac{2}{3}\right.}{3d^3}\end{aligned}$$

Mathematica [A]
time = 0.06, size = 136, normalized size = 0.90

$$\frac{b^2e^{\frac{e}{(c+dx)^3}}(c+dx)^3-b^2e\text{Ei}\left(\frac{e}{(c+dx)^3}\right)-2b(bc-ad)\left(-\frac{e}{(c+dx)^3}\right)^{2/3}(c+dx)^2\Gamma\left(-\frac{2}{3},-\frac{e}{(c+dx)^3}\right)+(bc-ad)^2\sqrt[3]{-\frac{e}{(c+dx)^3}}(c+dx)\Gamma\left(-\frac{1}{3},-\frac{e}{(c+dx)^3}\right)}{3d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x)^3)*(a + b*x)^2,x]
```

```
[Out] (b^2*E^(e/(c + d*x)^3)*(c + d*x)^3 - b^2*e*ExpIntegralEi[e/(c + d*x)^3] - 2
*b*(b*c - a*d)*(-(e/(c + d*x)^3))^(2/3)*(c + d*x)^2*Gamma[-2/3, -(e/(c + d*
x)^3)] + (b*c - a*d)^2*(-(e/(c + d*x)^3))^(1/3)*(c + d*x)*Gamma[-1/3, -(e/(
c + d*x)^3)])/(3*d^3)
```

Maple [F]
time = 0.03, size = 0, normalized size = 0.00

$$\int \mathrm{e}^{\frac{e}{(dx+c)^3}} (bx+a)^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(d*x+c)^3)*(b*x+a)^2,x)
```

```
[Out] int(exp(e/(d*x+c)^3)*(b*x+a)^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)*(b*x+a)^2,x, algorithm="maxima")
```

```
[Out] 1/3*(b^2*x^3 + 3*a*b*x^2 + 3*a^2*x)*e^(e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x
 + c^3)) + integrate((b^2*d*e*x^3 + 3*a*b*d*e*x^2 + 3*a^2*d*e*x)*e^(e/(d^3*
x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/(d^4*x^4 + 4*c*d^3*x^3 + 6*c^2*d^2*x^
2 + 4*c^3*d*x + c^4), x)
```

Fricas [A]
time = 0.09, size = 266, normalized size = 1.76

$$-\frac{b^2 \mathrm{Ei}\left(\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right) e - 3\,(b^2cd^2 - abd^3)\left(-\frac{e}{d^3}\right)^{\frac{2}{3}} \Gamma\left(\frac{1}{3}, -\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right) + 3\,(b^2c^2d - 2\,abcd^2 + a^2d^3)\left(-\frac{e}{d^3}\right)^{\frac{1}{3}} \Gamma\left(\frac{2}{3}, -\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right) - (b^2d^3x^3 + 3\,abd^3x^2 + 3\,a^2d^3x + b^2c^3 - 3\,abc^2d + 3\,a^2cd^2)e^{\left(\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)}}{3\,d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)*(b*x+a)^2,x, algorithm="fricas")
```

```
[Out] -1/3*(b^2*Ei(e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))*e - 3*(b^2*c*d^2
- a*b*d^3)*(-e/d^3)^(2/3)*gamma(1/3, -e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x
+ c^3)) + 3*(b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*(-e/d^3)^(1/3)*gamma(2/3, -
e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)) - (b^2*d^3*x^3 + 3*a*b*d^3*x^2
 + 3*a^2*d^3*x + b^2*c^3 - 3*a*b*c^2*d + 3*a^2*c*d^2)*e^(e/(d^3*x^3 + 3*c*d
^2*x^2 + 3*c^2*d*x + c^3)))/d^3
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int (a+bx)^2 \, e^{\frac{e}{c^3+3c^2dx+3cd^2x^2+d^3x^3}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**3)*(b*x+a)**2,x)
```

```
[Out] Integral((a + b*x)**2*exp(e/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3)
), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)*(b*x+a)^2,x, algorithm="giac")
```

```
[Out] integrate((b*x + a)^2*e^(e/(d*x + c)^3), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{e}^{\frac{e}{(c+d\,x)^3}}\,{\left(a+b\,x\right)}^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^3)*(a + b*x)^2,x)
```

```
[Out] int(exp(e/(c + d*x)^3)*(a + b*x)^2, x)
```

3.418 $\int e^{\frac{e}{(c+dx)^3}}(a+bx)\,dx$

Optimal. Leaf size=92

$$\frac{b\left(-\frac{e}{(c+dx)^3}\right)^{2/3}(c+dx)^2\Gamma\left(-\frac{2}{3},-\frac{e}{(c+dx)^3}\right)}{3d^2}-\frac{(bc-ad)\sqrt[3]{-\frac{e}{(c+dx)^3}}\,(c+dx)\Gamma\left(-\frac{1}{3},-\frac{e}{(c+dx)^3}\right)}{3d^2}$$

```
[Out] 1/3*b*(-e/(d*x+c)^3)^(2/3)*(d*x+c)^2*GAMMA(-2/3,-e/(d*x+c)^3)/d^2-1/3*(-a*d
+b*c)*(-e/(d*x+c)^3)^(1/3)*(d*x+c)*GAMMA(-1/3,-e/(d*x+c)^3)/d^2
```

Rubi [A]
time = 0.04, antiderivative size = 92, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.176$, Rules used = {2258, 2239, 2250}

$$\frac{b(c+dx)^2\left(-\frac{e}{(c+dx)^3}\right)^{2/3}\text{Gamma}\left(-\frac{2}{3},-\frac{e}{(c+dx)^3}\right)}{3d^2}-\frac{(c+dx)(bc-ad)\sqrt[3]{-\frac{e}{(c+dx)^3}}\,\text{Gamma}\left(-\frac{1}{3},-\frac{e}{(c+dx)^3}\right)}{3d^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x)^3)*(a + b*x),x]
```

```
[Out] (b*(-(e/(c + d*x)^3))^(2/3)*(c + d*x)^2*Gamma[-2/3, -(e/(c + d*x)^3)])/(3*d
^2) - ((b*c - a*d)*(-(e/(c + d*x)^3))^(1/3)*(c + d*x)*Gamma[-1/3, -(e/(c +
d*x)^3)])/(3*d^2)
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int e^{\frac{e}{(c+dx)^3}}(a+bx)\,dx=\int\left(\frac{(-bc+ad)e^{\frac{e}{(c+dx)^3}}}{d}+\frac{be^{\frac{e}{(c+dx)^3}}(c+dx)}{d}\right)dx$$
$$=\frac{b\int e^{\frac{e}{(c+dx)^3}}(c+dx)\,dx}{d}+\frac{(-bc+ad)\int e^{\frac{e}{(c+dx)^3}}\,dx}{d}$$
$$=\frac{b\left(-\frac{e}{(c+dx)^3}\right)^{2/3}(c+dx)^2\Gamma\left(-\frac{2}{3},-\frac{e}{(c+dx)^3}\right)}{3d^2}-\frac{(bc-ad)\sqrt[3]{-\frac{e}{(c+dx)^3}}(c+dx)\Gamma\Big(-}{3d^2}$$

Mathematica [A]
time = 0.06, size = 85, normalized size = 0.92

$$\frac{(c+dx)\left(b\left(-\frac{e}{(c+dx)^3}\right)^{2/3}(c+dx)\Gamma\left(-\frac{2}{3},-\frac{e}{(c+dx)^3}\right)+(-bc+ad)\sqrt[3]{-\frac{e}{(c+dx)^3}}\Gamma\left(-\frac{1}{3},-\frac{e}{(c+dx)^3}\right)\right)}{3d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x)^3)*(a + b*x),x]
[Out] ((c + d*x)*(b*(-(e/(c + d*x)^3))^(2/3)*(c + d*x)*Gamma[-2/3, -(e/(c + d*x)^
3)] + (-(b*c) + a*d)*(-(e/(c + d*x)^3))^(1/3)*Gamma[-1/3, -(e/(c + d*x)^3)]
))/(3*d^2)
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int \mathrm{e}^{\frac{e}{(dx+c)^3}}(bx+a)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(d*x+c)^3)*(b*x+a),x)
[Out] int(exp(e/(d*x+c)^3)*(b*x+a),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)*(b*x+a),x, algorithm="maxima")
```

```
[Out] 1/2*(b*x^2 + 2*a*x)*e^(e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)) + integ
rate(3/2*(b*d*e*x^2 + 2*a*d*e*x)*e^(e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x +
c^3))/(d^4*x^4 + 4*c*d^3*x^3 + 6*c^2*d^2*x^2 + 4*c^3*d*x + c^4), x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 174 vs. $2(84) = 168$.
time = 0.09, size = 174, normalized size = 1.89

$$-\frac{bd^2\left(-\frac{e}{d^3}\right)^{\frac{2}{3}}\Gamma\left(\frac{1}{3}, -\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right) - 2\,(bcd - ad^2)\left(-\frac{e}{d^3}\right)^{\frac{1}{3}}\Gamma\left(\frac{2}{3}, -\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right) - (bd^2x^2 + 2\,ad^2x - bc^2 + 2\,acd)e^{\left(\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)}}{2\,d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)*(b*x+a),x, algorithm="fricas")
```

```
[Out] -1/2*(b*d^2*(-e/d^3)^(2/3)*gamma(1/3, -e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x
 + c^3)) - 2*(b*c*d - a*d^2)*(-e/d^3)^(1/3)*gamma(2/3, -e/(d^3*x^3 + 3*c*d^
2*x^2 + 3*c^2*d*x + c^3)) - (b*d^2*x^2 + 2*a*d^2*x - b*c^2 + 2*a*c*d)*e^(e/
(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)))/d^2
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int (a + bx)\, e^{\frac{e}{c^3+3c^2dx+3cd^2x^2+d^3x^3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**3)*(b*x+a),x)
```

```
[Out] Integral((a + b*x)*exp(e/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3)),
x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)*(b*x+a),x, algorithm="giac")
```

```
[Out] integrate((b*x + a)*e^(e/(d*x + c)^3), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{e}^{\frac{e}{(c+d\,x)^3}}\,(a + b\,x)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^3)*(a + b*x),x)
```

```
[Out] int(exp(e/(c + d*x)^3)*(a + b*x), x)
```

3.419 $\int e^{\frac{e}{(c+dx)^3}}\,dx$

Optimal. Leaf size=40

$$\frac{\sqrt[3]{-\frac{e}{(c+dx)^3}}\,(c+dx)\Gamma\left(-\frac{1}{3},-\frac{e}{(c+dx)^3}\right)}{3d}$$

```
[Out] 1/3*(-e/(d*x+c)^3)^(1/3)*(d*x+c)*GAMMA(-1/3,-e/(d*x+c)^3)/d
```

Rubi [A]
time = 0.00, antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2239}

$$\frac{(c+dx)\sqrt[3]{-\frac{e}{(c+dx)^3}}\,\text{Gamma}\left(-\frac{1}{3},-\frac{e}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x)^3),x]
```

```
[Out] ((-(e/(c + d*x)^3))^(1/3)*(c + d*x)*Gamma[-1/3, -(e/(c + d*x)^3)])/(3*d)
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] && !IntegerQ[2/n]
```

Rubi steps

$$\int e^{\frac{e}{(c+dx)^3}}\,dx = \frac{\sqrt[3]{-\frac{e}{(c+dx)^3}}\,(c+dx)\Gamma\left(-\frac{1}{3},-\frac{e}{(c+dx)^3}\right)}{3d}$$

Mathematica [A]
time = 0.01, size = 40, normalized size = 1.00

$$\frac{\sqrt[3]{-\frac{e}{(c+dx)^3}}\,(c+dx)\Gamma\left(-\frac{1}{3},-\frac{e}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x)^3),x]
```

```
[Out] ((-(e/(c + d*x)^3))^(1/3)*(c + d*x)*Gamma[-1/3, -(e/(c + d*x)^3)])/(3*d)
```

Maple [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \mathrm{e}^{\frac{e}{(dx+c)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(d*x+c)^3),x)
```

```
[Out] int(exp(e/(d*x+c)^3),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3),x, algorithm="maxima")
```

```
[Out] 3*d*e*integrate(x*e^(e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/(d^4*x^4
+ 4*c*d^3*x^3 + 6*c^2*d^2*x^2 + 4*c^3*d*x + c^4), x) + x*e^(e/(d^3*x^3 + 3*
c*d^2*x^2 + 3*c^2*d*x + c^3))
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 92 vs. $2(36) = 72$.
time = 0.09, size = 92, normalized size = 2.30

$$-\frac{d\left(-\frac{e}{d^3}\right)^{\frac{1}{3}}\Gamma\left(\frac{2}{3}, -\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)-(dx+c)e^{\left(\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3),x, algorithm="fricas")
```

```
[Out] -(d*(-e/d^3)^(1/3)*gamma(2/3, -e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))
 - (d*x + c)*e^(e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)))/d
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int e^{\frac{e}{(c+dx)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**3),x)
```

```
[Out] Integral(exp(e/(c + d*x)**3), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3),x, algorithm="giac")
```

```
[Out] integrate(e^(e/(d*x + c)^3), x)
```

Mupad [B]
time = 3.95, size = 61, normalized size = 1.52

$$\frac{(c+d\,x)\,\left(\mathrm{e}^{\frac{e}{(c+d\,x)^3}}+\Gamma\left(\frac{2}{3}\right)\,\left(-\frac{e}{(c+d\,x)^3}\right)^{1/3}-\left(-\frac{e}{(c+d\,x)^3}\right)^{1/3}\Gamma\left(\frac{2}{3},-\frac{e}{(c+d\,x)^3}\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^3),x)
```

```
[Out] ((c + d*x)*(exp(e/(c + d*x)^3) + gamma(2/3)*(-e/(c + d*x)^3)^(1/3) - (-e/(c
 + d*x)^3)^(1/3)*igamma(2/3, -e/(c + d*x)^3)))/d
```

3.420 $\int \frac{e^{\frac{e}{(c+dx)^3}}}{a+bx} dx$

Optimal. Leaf size=22

$$\text{Int}\left(\frac{e^{\frac{e}{(c+dx)^3}}}{a+bx},x\right)$$

```
[Out] Unintegrable(exp(e/(d*x+c)^3)/(b*x+a),x)
```

Rubi [A]
time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{e^{\frac{e}{(c+dx)^3}}}{a+bx} dx$$

Verification is not applicable to the result.

```
[In] Int[E^(e/(c + d*x)^3)/(a + b*x),x]
```

```
[Out] Defer[Int][E^(e/(c + d*x)^3)/(a + b*x), x]
```

Rubi steps

$$\int \frac{e^{\frac{e}{(c+dx)^3}}}{a+bx} dx = \int \frac{e^{\frac{e}{(c+dx)^3}}}{a+bx} dx$$

Mathematica [A]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{(c+dx)^3}}}{a+bx} dx$$

Verification is not applicable to the result.

```
[In] Integrate[E^(e/(c + d*x)^3)/(a + b*x),x]
```

```
[Out] Integrate[E^(e/(c + d*x)^3)/(a + b*x), x]
```

Maple [A]
time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{(dx+c)^3}}}{bx+a} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(d*x+c)^3)/(b*x+a),x)
```

```
[Out] int(exp(e/(d*x+c)^3)/(b*x+a),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)/(b*x+a),x, algorithm="maxima")
```

```
[Out] integrate(e^(e/(d*x + c)^3)/(b*x + a), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)/(b*x+a),x, algorithm="fricas")
```

```
[Out] integral(e^(e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/(b*x + a), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{c^3+3c^2dx+3cd^2x^2+d^3x^3}}}{a+bx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**3)/(b*x+a),x)
```

```
[Out] Integral(exp(e/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3))/(a + b*x),
x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)/(b*x+a),x, algorithm="giac")
```

```
[Out] integrate(e^(e/(d*x + c)^3)/(b*x + a), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{\mathrm{e}^{\frac{e}{(c+d\,x)^3}}}{a+b\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^3)/(a + b*x),x)
[Out] int(exp(e/(c + d*x)^3)/(a + b*x), x)
```

3.421 $\int \frac{e^{\frac{e}{(c+dx)^3}}}{(a+bx)^2} dx$

Optimal. Leaf size=22

$$\text{Int}\left(\frac{e^{\frac{e}{(c+dx)^3}}}{(a+bx)^2}, x\right)$$

```
[Out] CannotIntegrate(exp(e/(d*x+c)^3)/(b*x+a)^2,x)
```

Rubi [A]
time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{e^{\frac{e}{(c+dx)^3}}}{(a+bx)^2} dx$$

Verification is not applicable to the result.

```
[In] Int[E^(e/(c + d*x)^3)/(a + b*x)^2,x]
```

```
[Out] Defer[Int][E^(e/(c + d*x)^3)/(a + b*x)^2, x]
```

Rubi steps

$$\int \frac{e^{\frac{e}{(c+dx)^3}}}{(a+bx)^2} dx = \int \frac{e^{\frac{e}{(c+dx)^3}}}{(a+bx)^2} dx$$

Mathematica [A]
time = 0.22, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{(c+dx)^3}}}{(a+bx)^2} dx$$

Verification is not applicable to the result.

```
[In] Integrate[E^(e/(c + d*x)^3)/(a + b*x)^2,x]
```

```
[Out] Integrate[E^(e/(c + d*x)^3)/(a + b*x)^2, x]
```

Maple [A]
time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{e}^{\frac{e}{(dx+c)^3}}}{(bx+a)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(d*x+c)^3)/(b*x+a)^2,x)
```

```
[Out] int(exp(e/(d*x+c)^3)/(b*x+a)^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)/(b*x+a)^2,x, algorithm="maxima")
```

```
[Out] integrate(e^(e/(d*x + c)^3)/(b*x + a)^2, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)/(b*x+a)^2,x, algorithm="fricas")
```

```
[Out] integral(e^(e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/(b^2*x^2 + 2*a*b*x
 + a^2), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{c^3+3c^2dx+3cd^2x^2+d^3x^3}}}{(a+bx)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**3)/(b*x+a)**2,x)
```

```
[Out] Integral(exp(e/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3))/(a + b*x)**
2, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)/(b*x+a)^2,x, algorithm="giac")
```

```
[Out] undef
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{e^{\frac{e}{(c+d\,x)^3}}}{(a+b\,x)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^3)/(a + b*x)^2,x)
[Out] int(exp(e/(c + d*x)^3)/(a + b*x)^2, x)
```

3.422 $\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{g+hx}\,dx$

Optimal. Leaf size=104

$$-\frac{F^{e+\frac{bf}{d}}\operatorname{Ei}\left(-\frac{(bc-ad)f\log(F)}{d(c+dx)}\right)}{h}+\frac{F^{e+\frac{f(bg-ah)}{dg-ch}}\operatorname{Ei}\left(-\frac{(bc-ad)f(g+hx)\log(F)}{(dg-ch)(c+dx)}\right)}{h}$$

```
[Out] -F^(e+b*f/d)*Ei(-(-a*d+b*c)*f*ln(F)/d/(d*x+c))/h+F^(e+f*(-a*h+b*g)/(-c*h+d*
g))*Ei(-(-a*d+b*c)*f*(h*x+g)*ln(F)/(-c*h+d*g)/(d*x+c))/h
```

Rubi [A]
time = 0.70, antiderivative size = 104, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.192$, Rules used = {2263, 2262, 2241, 2265, 2209}

$$\frac{F^{\frac{f(bg-ah)}{dg-ch}+e}\operatorname{Ei}\left(-\frac{(bc-ad)f(g+hx)\log(F)}{(dg-ch)(c+dx)}\right)}{h}-\frac{F^{\frac{bf}{d}+e}\operatorname{Ei}\left(-\frac{(bc-ad)f\log(F)}{d(c+dx)}\right)}{h}$$

Antiderivative was successfully verified.

```
[In] Int[F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x),x]
```

```
[Out] -((F^(e + (b*f)/d)*ExpIntegralEi[-(((b*c - a*d)*f*Log[F])/(d*(c + d*x)))])/
h) + (F^(e + (f*(b*g - a*h))/(d*g - c*h))*ExpIntegralEi[-(((b*c - a*d)*f*(g
 + h*x)*Log[F])/((d*g - c*h)*(c + d*x)))])/h
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2262

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))*((g_.)
 + (h_.)*(x_))^(m_.), x_Symbol] :> Int[(g + h*x)^m*F^((d*e + b*f)/d - f*((b
*c - a*d)/(d*(c + d*x)))), x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m}, x] &
& NeQ[b*c - a*d, 0] && EqQ[d*g - c*h, 0]
```

Rule 2263

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))/((g_.)
 + (h_.)*(x_)), x_Symbol] :> Dist[d/h, Int[F^(e + f*((a + b*x)/(c + d*x)))/
(c + d*x), x], x] - Dist[(d*g - c*h)/h, Int[F^(e + f*((a + b*x)/(c + d*x)))
/((c + d*x)*(g + h*x)), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, h}, x] &&
NeQ[b*c - a*d, 0] && NeQ[d*g - c*h, 0]
```

Rule 2265

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))/(((g_.
) + (h_.)*(x_))*((i_.) + (j_.)*(x_))), x_Symbol] :> Dist[-d/(h*(d*i - c*j))
, Subst[Int[F^(e + f*((b*i - a*j)/(d*i - c*j)) - (b*c - a*d)*f*(x/(d*i - c*
j)))/x, x], x, (i + j*x)/(c + d*x)], x] /; FreeQ[{F, a, b, c, d, e, f, g, h
}, x] && EqQ[d*g - c*h, 0]
```

Rubi steps

$$\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{g+hx}\,dx = \frac{d\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{c+dx}\,dx}{h} - \frac{(dg-ch)\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(c+dx)(g+hx)}\,dx}{h}$$

$$= \frac{\text{Subst}\left(\int \frac{F^{e+\frac{f(bg-ah)}{dg-ch}-\frac{(bc-ad)fx}{dg-ch}}}{x}\,dx, x, \frac{g+hx}{c+dx}\right)}{h} + \frac{d\int \frac{F^{\frac{de+bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{c+dx}\,dx}{h}$$

$$= -\frac{F^{e+\frac{bf}{d}}\text{Ei}\left(-\frac{(bc-ad)f\log(F)}{d(c+dx)}\right)}{h} + \frac{F^{e+\frac{f(bg-ah)}{dg-ch}}\text{Ei}\left(-\frac{(bc-ad)f(g+hx)\log(F)}{(dg-ch)(c+dx)}\right)}{h}$$

Mathematica [A]
time = 0.22, size = 103, normalized size = 0.99

$$\frac{F^{e+\frac{bf}{d}}\left(-\text{Ei}\left(\frac{(-bcf+adf)\log(F)}{d(c+dx)}\right)+F^{\frac{(bc-ad)fh}{d(dg-ch)}}\text{Ei}\left(\frac{(bc-ad)f(g+hx)\log(F)}{(-dg+ch)(c+dx)}\right)\right)}{h}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x),x]
[Out] (F^(e + (b*f)/d)*(-ExpIntegralEi[((-(b*c*f) + a*d*f)*Log[F])/(d*(c + d*x))]
 + F^(((b*c - a*d)*f*h)/(d*(d*g - c*h)))*ExpIntegralEi[((b*c - a*d)*f*(g +
h*x)*Log[F])/((-(d*g) + c*h)*(c + d*x))]))/h
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 431 vs. 2(104) = 208.
time = 0.17, size = 432, normalized size = 4.15

method	result
risch	$\frac{dF^{\frac{bf+ed}{d}}\operatorname{expIntegral}\left(1,-\frac{f(ad-cb)\ln(F)}{d(dx+c)}-\frac{(bf+ed)\ln(F)}{d}-\frac{-\ln(F)bf-de\ln(F)}{d}\right)a}{h(ad-cb)}-\frac{F^{\frac{bf+ed}{d}}\operatorname{expIntegral}\left(1,-\frac{f(ad-cb)\ln(F)}{d(dx+c)}-\frac{(bf+ed)\ln}{d}\right.}{h(ad-cb)}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g),x,method=_RETURNVERBOSE)
```

```
[Out] d/h/(a*d-b*c)*F^((b*f+d*e)/d)*Ei(1,-f*(a*d-b*c)*ln(F)/d/(d*x+c)-(b*f+d*e)*l
n(F)/d-(-ln(F)*b*f-d*e*ln(F))/d)*a-1/h/(a*d-b*c)*F^((b*f+d*e)/d)*Ei(1,-f*(a
*d-b*c)*ln(F)/d/(d*x+c)-(b*f+d*e)*ln(F)/d-(-ln(F)*b*f-d*e*ln(F))/d)*c*b-d/h
/(a*d-b*c)*F^((a*f*h-b*f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei(1,-f*(a*d-b*c)*ln(F)/
d/(d*x+c)-(b*f+d*e)*ln(F)/d-(-ln(F)*a*f*h+ln(F)*b*f*g-ln(F)*c*e*h+ln(F)*d*e
*g)/(c*h-d*g))*a+1/h/(a*d-b*c)*F^((a*f*h-b*f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei(1
,-f*(a*d-b*c)*ln(F)/d/(d*x+c)-(b*f+d*e)*ln(F)/d-(-ln(F)*a*f*h+ln(F)*b*f*g-l
n(F)*c*e*h+ln(F)*d*e*g)/(c*h-d*g))*c*b
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g),x, algorithm="maxima")
```

```
[Out] integrate(F^(e + (b*x + a)*f/(d*x + c))/(h*x + g), x)
```

Fricas [A]
time = 0.37, size = 137, normalized size = 1.32

$$-\frac{F^{\frac{bf+de}{d}}\operatorname{Ei}\left(-\frac{(bc-ad)f\log(F)}{d^2x+cd}\right)-F^{\frac{bfg-afh+(dg-ch)e}{dg-ch}}\operatorname{Ei}\left(-\frac{((bc-ad)fhx+(bc-ad)fg)\log(F)}{cdg-c^2h+(d^2g-cdh)x}\right)}{h}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g),x, algorithm="fricas")
```

```
[Out] -(F^((b*f + d*e)/d)*Ei(-(b*c - a*d)*f*log(F)/(d^2*x + c*d)) - F^((b*f*g - a
*f*h + (d*g - c*h)*e)/(d*g - c*h))*Ei(-((b*c - a*d)*f*h*x + (b*c - a*d)*f*g
)*log(F)/(c*d*g - c^2*h + (d^2*g - c*d*h)*x)))/h
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(e+f*(b*x+a)/(d*x+c))/(h*x+g),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g),x, algorithm="giac")
```

```
[Out] integrate(F^((b*x + a)*f/(d*x + c) + e)/(h*x + g), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{F^{e+\frac{f\,(a+b\,x)}{c+d\,x}}}{g+h\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x),x)
```

```
[Out] int(F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x), x)
```

3.423 $\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(g+hx)^2}\,dx$

Optimal. Leaf size=159

$$\frac{dF^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{h(dg-ch)}-\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{h(g+hx)}+\frac{(bc-ad)fF^{e+\frac{f(bg-ah)}{dg-ch}}\operatorname{Ei}\left(-\frac{(bc-ad)f(g+hx)\log(F)}{(dg-ch)(c+dx)}\right)\log(F)}{(dg-ch)^2}$$

```
[Out] d*F^(e+b*f/d-(-a*d+b*c)*f/d/(d*x+c))/h/(-c*h+d*g)-F^(e+f*(b*x+a)/(d*x+c))/h
/(h*x+g)+(-a*d+b*c)*f*F^(e+f*(-a*h+b*g)/(-c*h+d*g))*Ei(-(-a*d+b*c)*f*(h*x+g
)*ln(F)/(-c*h+d*g)/(d*x+c))*ln(F)/(-c*h+d*g)^2
```

Rubi [A]
time = 1.65, antiderivative size = 159, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$, Rules used = {2264, 6874, 2262, 2240, 2241, 2263, 2265, 2209}

$$\frac{f\log(F)(bc-ad)F^{\frac{f(bg-ah)}{dg-ch}+e}\operatorname{Ei}\left(-\frac{(bc-ad)f(g+hx)\log(F)}{(dg-ch)(c+dx)}\right)}{(dg-ch)^2}+\frac{dF^{-\frac{f(bc-ad)}{d(c+dx)}+\frac{bf}{d}+e}}{h(dg-ch)}-\frac{F^{\frac{f(a+bx)}{c+dx}+e}}{h(g+hx)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^2,x]
```

```
[Out] (d*F^(e + (b*f)/d - ((b*c - a*d)*f)/(d*(c + d*x))))/(h*(d*g - c*h)) - F^(e
+ (f*(a + b*x))/(c + d*x))/(h*(g + h*x)) + ((b*c - a*d)*f*F^(e + (f*(b*g -
a*h))/(d*g - c*h))*ExpIntegralEi[-(((b*c - a*d)*f*(g + h*x)*Log[F])/((d*g -
 c*h)*(c + d*x)))]*Log[F])/(d*g - c*h)^2
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
```

```
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2262

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))*((g_.)
 + (h_.)*(x_))^(m_.), x_Symbol] :> Int[(g + h*x)^m*F^((d*e + b*f)/d - f*((b
*c - a*d)/(d*(c + d*x)))), x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m}, x] &
& NeQ[b*c - a*d, 0] && EqQ[d*g - c*h, 0]
```

Rule 2263

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))/((g_.)
 + (h_.)*(x_)), x_Symbol] :> Dist[d/h, Int[F^(e + f*((a + b*x)/(c + d*x)))/
(c + d*x), x], x] - Dist[(d*g - c*h)/h, Int[F^(e + f*((a + b*x)/(c + d*x)))
/((c + d*x)*(g + h*x)), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, h}, x] &&
NeQ[b*c - a*d, 0] && NeQ[d*g - c*h, 0]
```

Rule 2264

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))*((g_.)
 + (h_.)*(x_))^(m_), x_Symbol] :> Simp[(g + h*x)^(m + 1)*(F^(e + f*((a + b*
x)/(c + d*x)))/(h*(m + 1))), x] - Dist[f*(b*c - a*d)*(Log[F]/(h*(m + 1))),
Int[(g + h*x)^(m + 1)*(F^(e + f*((a + b*x)/(c + d*x)))/(c + d*x)^2), x], x]
 /; FreeQ[{F, a, b, c, d, e, f, g, h}, x] && NeQ[b*c - a*d, 0] && NeQ[d*g -
 c*h, 0] && ILtQ[m, -1]
```

Rule 2265

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))/(((g_.
) + (h_.)*(x_))*((i_.) + (j_.)*(x_))), x_Symbol] :> Dist[-d/(h*(d*i - c*j))
, Subst[Int[F^(e + f*((b*i - a*j)/(d*i - c*j)) - (b*c - a*d)*f*(x/(d*i - c*
j)))/x, x], x, (i + j*x)/(c + d*x)], x] /; FreeQ[{F, a, b, c, d, e, f, g, h
}, x] && EqQ[d*g - c*h, 0]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(g+hx)^2}\,dx = -\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{h(g+hx)} + \frac{((bc-ad)f\log(F))\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(c+dx)^2(g+hx)}\,dx}{h}$$

$$= -\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{h(g+hx)} + \frac{((bc-ad)f\log(F))\int \left(\frac{dF^{e+\frac{f(a+bx)}{c+dx}}}{(dg-ch)(c+dx)^2} - \frac{dF^{e+\frac{f(a+bx)}{c+dx}}h}{(dg-ch)^2(c+dx)} + \frac{F^{e+\frac{f(a+bx)}{c+dx}}h^2}{(dg-ch)^2(g+hx)}\right)dx}{h}$$

$$= -\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{h(g+hx)} - \frac{(d(bc-ad)f\log(F))\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{c+dx}\,dx}{(dg-ch)^2} + \frac{((bc-ad)fh\log(F))\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{g+hx}\,d}{(dg-ch)^2}$$

$$= -\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{h(g+hx)} - \frac{(d(bc-ad)f\log(F))\int \frac{F^{\frac{de+bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{c+dx}\,dx}{(dg-ch)^2} + \frac{(d(bc-ad)f\log(F))\int \frac{F^{e+\frac{f(a+}{c+}}}{c+dx}}{(dg-ch)^2}$$

$$= \frac{dF^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{h(dg-ch)} - \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{h(g+hx)} + \frac{(bc-ad)fF^{e+\frac{bf}{d}}\operatorname{Ei}\left(-\frac{(bc-ad)f\log(F)}{d(c+dx)}\right)\log(F)}{(dg-ch)^2} + \frac{((bc-ad)}{}$$

$$= \frac{dF^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{h(dg-ch)} - \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{h(g+hx)} + \frac{(bc-ad)fF^{e+\frac{f(bg-ah)}{dg-ch}}\operatorname{Ei}\left(-\frac{(bc-ad)f(g+hx)\log(F)}{(dg-ch)(c+dx)}\right)\log(F)}{(dg-ch)^2}$$

Mathematica [**F**]
time = 0.57, size = 0, normalized size = 0.00

$$\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(g+hx)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^2,x]
[Out] Integrate[F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^2, x]
```

Maple [**B**] Leaf count of result is larger than twice the leaf count of optimal. 579 vs. 2(159) = 318.
time = 0.13, size = 580, normalized size = 3.65

method	result
risch	$\frac{f\ln(F)F^{\frac{bf+ed}{d}}F^{\frac{f(ad-cb)}{d(dx+c)}}ad}{(ch-dg)^2\left(\frac{f\ln(F)a}{dx+c}-\frac{f\ln(F)cb}{d(dx+c)}+\frac{\ln(F)bf}{d}+\ln(F)e-\frac{\ln(F)afh}{ch-dg}+\frac{\ln(F)bfg}{ch-dg}-\frac{\ln(F)ceh}{ch-dg}+\frac{\ln(F)deg}{ch-dg}\right)} - \frac{f\ln(F}{(ch-dg)^2\left(\frac{f\ln(F)a}{dx+c}-\frac{f\ln(F)cb}{d(dx+c)}+\frac{\ln(F)b}{d}\right.}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g)^2,x,method=_RETURNVERBOSE)
```

```
[Out] f*ln(F)/(c*h-d*g)^2*F^((b*f+d*e)/d)*F^(f*(a*d-b*c)/d/(d*x+c))/(f*ln(F)/(d*x
+c)*a-f*ln(F)/d/(d*x+c)*c*b+ln(F)/d*b*f+ln(F)*e-1/(c*h-d*g)*ln(F)*a*f*h+1/(
c*h-d*g)*ln(F)*b*f*g-1/(c*h-d*g)*ln(F)*c*e*h+1/(c*h-d*g)*ln(F)*d*e*g)*a*d-f
*ln(F)/(c*h-d*g)^2*F^((b*f+d*e)/d)*F^(f*(a*d-b*c)/d/(d*x+c))/(f*ln(F)/(d*x+
c)*a-f*ln(F)/d/(d*x+c)*c*b+ln(F)/d*b*f+ln(F)*e-1/(c*h-d*g)*ln(F)*a*f*h+1/(c
*h-d*g)*ln(F)*b*f*g-1/(c*h-d*g)*ln(F)*c*e*h+1/(c*h-d*g)*ln(F)*d*e*g)*c*b+f*
ln(F)/(c*h-d*g)^2*F^((a*f*h-b*f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei(1,-f*(a*d-b*c)
*ln(F)/d/(d*x+c)-(b*f+d*e)*ln(F)/d-(-ln(F)*a*f*h+ln(F)*b*f*g-ln(F)*c*e*h+ln
(F)*d*e*g)/(c*h-d*g))*a*d-f*ln(F)/(c*h-d*g)^2*F^((a*f*h-b*f*g+c*e*h-d*e*g)/
(c*h-d*g))*Ei(1,-f*(a*d-b*c)*ln(F)/d/(d*x+c)-(b*f+d*e)*ln(F)/d-(-ln(F)*a*f*
h+ln(F)*b*f*g-ln(F)*c*e*h+ln(F)*d*e*g)/(c*h-d*g))*c*b
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g)^2,x, algorithm="maxima")
[Out] integrate(F^(e + (b*x + a)*f/(d*x + c))/(h*x + g)^2, x)
```

Fricas [**A**]
time = 0.40, size = 221, normalized size = 1.39

$$\frac{((bc-ad)fhx+(bc-ad)fg)F^{\frac{bfg-afh+(dg-ch)e}{dg-ch}}\mathrm{Ei}\left(-\frac{((bc-ad)fhx+(bc-ad)fg)\log(F)}{cdg-c^2h+(d^2g-cdh)x}\right)\log(F)+(cdg-c^2h+(d^2g-cdh)x)F^{\frac{bfx+af+(dx+c)e}{dx+c}}}{d^2g^3-2\,cdg^2h+c^2gh^2+(d^2g^2h-2\,cdgh^2+c^2h^3)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g)^2,x, algorithm="fricas")
[Out] (((b*c - a*d)*f*h*x + (b*c - a*d)*f*g)*F^((b*f*g - a*f*h + (d*g - c*h)*e)/(
d*g - c*h))*Ei(-((b*c - a*d)*f*h*x + (b*c - a*d)*f*g)*log(F)/(c*d*g - c^2*h
 + (d^2*g - c*d*h)*x))*log(F) + (c*d*g - c^2*h + (d^2*g - c*d*h)*x)*F^((b*f
*x + a*f + (d*x + c)*e)/(d*x + c)))/(d^2*g^3 - 2*c*d*g^2*h + c^2*g*h^2 + (d
^2*g^2*h - 2*c*d*g*h^2 + c^2*h^3)*x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(e+f*(b*x+a)/(d*x+c))/(h*x+g)**2,x)
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g)^2,x, algorithm="giac")
```

```
[Out] integrate(F^((b*x + a)*f/(d*x + c) + e)/(h*x + g)^2, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{F^{e+\frac{f\,(a+b\,x)}{c+d\,x}}}{{(g+h\,x)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^2,x)
```

```
[Out] int(F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^2, x)
```

3.424 $\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(g+hx)^3} dx$

Optimal. Leaf size=366

$$\frac{d^2F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{2h(dg-ch)^2}-\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{2h(g+hx)^2}+\frac{d(bc-ad)fF^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}\log(F)}{2(dg-ch)^3}-\frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{2(dg-ch)^2(g+hx)}+\frac{d(bc-a}{}$$

```
[Out] 1/2*d^2*F^(e+b*f/d-(-a*d+b*c)*f/d/(d*x+c))/h/(-c*h+d*g)^2-1/2*F^(e+f*(b*x+a
)/(d*x+c))/h/(h*x+g)^2+1/2*d*(-a*d+b*c)*f*F^(e+b*f/d-(-a*d+b*c)*f/d/(d*x+c)
)*ln(F)/(-c*h+d*g)^3-1/2*(-a*d+b*c)*f*F^(e+f*(b*x+a)/(d*x+c))*ln(F)/(-c*h+d
*g)^2/(h*x+g)+d*(-a*d+b*c)*f*F^(e+f*(-a*h+b*g)/(-c*h+d*g))*Ei(-(-a*d+b*c)*f
*(h*x+g)*ln(F)/(-c*h+d*g)/(d*x+c))*ln(F)/(-c*h+d*g)^3+1/2*(-a*d+b*c)^2*f^2*
F^(e+f*(-a*h+b*g)/(-c*h+d*g))*h*Ei(-(-a*d+b*c)*f*(h*x+g)*ln(F)/(-c*h+d*g)/(
d*x+c))*ln(F)^2/(-c*h+d*g)^4
```

Rubi [A]
time = 3.29, antiderivative size = 366, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 8, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$, Rules used = {2264, 6874, 2262, 2240, 2241, 2263, 2265, 2209}

$$\frac{d^2F^{-\frac{f(bc-ad)}{d(c+dx)}+\frac{bf}{d}+e}}{2h(dg-ch)^2}+\frac{f^2h\log^2(F)(bc-ad)^2F^{\frac{f(bg-ah)}{dg-ch}+e}\text{Ei}\left(-\frac{(bc-ad)f(g+hx)\log(F)}{(dg-ch)(c+dx)}\right)}{2(dg-ch)^4}+\frac{df\log(F)(bc-ad)F^{\frac{f(bg-ah)}{dg-ch}+e}\text{Ei}\left(-\frac{(bc-ad)f(g+hx)\log(F)}{(dg-ch)(c+dx)}\right)}{(dg-ch)^3}-\frac{F^{\frac{f(a+bx)}{c+dx}+e}}{2h(g+hx)^2}+\frac{df\log(F)(bc-ad)F^{-\frac{f(bc-ad)}{d(c+dx)}+\frac{bf}{d}+e}}{2(dg-ch)^3}-\frac{f\log(F)(bc-ad)F^{\frac{f(a+bx)}{c+dx}+e}}{2(g+hx)(dg-ch)^2}$$

Antiderivative was successfully verified.

```
[In] Int[F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^3,x]
```

```
[Out] (d^2*F^(e + (b*f)/d - ((b*c - a*d)*f)/(d*(c + d*x))))/(2*h*(d*g - c*h)^2) -
 F^(e + (f*(a + b*x))/(c + d*x))/(2*h*(g + h*x)^2) + (d*(b*c - a*d)*f*F^(e
+ (b*f)/d - ((b*c - a*d)*f)/(d*(c + d*x)))*Log[F])/(2*(d*g - c*h)^3) - ((b*
c - a*d)*f*F^(e + (f*(a + b*x))/(c + d*x))*Log[F])/(2*(d*g - c*h)^2*(g + h*
x)) + (d*(b*c - a*d)*f*F^(e + (f*(b*g - a*h))/(d*g - c*h))*ExpIntegralEi[-(
((b*c - a*d)*f*(g + h*x)*Log[F])/((d*g - c*h)*(c + d*x)))]*Log[F])/(d*g - c
*h)^3 + ((b*c - a*d)^2*f^2*F^(e + (f*(b*g - a*h))/(d*g - c*h))*h*ExpIntegra
lEi[-(((b*c - a*d)*f*(g + h*x)*Log[F])/((d*g - c*h)*(c + d*x)))]*Log[F]^2)/
(2*(d*g - c*h)^4)
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
```

```
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2262

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))*((g_.)
 + (h_.)*(x_))^(m_.), x_Symbol] :> Int[(g + h*x)^m*F^((d*e + b*f)/d - f*((b
*c - a*d)/(d*(c + d*x)))), x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m}, x] &
& NeQ[b*c - a*d, 0] && EqQ[d*g - c*h, 0]
```

Rule 2263

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))/((g_.)
 + (h_.)*(x_)), x_Symbol] :> Dist[d/h, Int[F^(e + f*((a + b*x)/(c + d*x)))/
(c + d*x), x], x] - Dist[(d*g - c*h)/h, Int[F^(e + f*((a + b*x)/(c + d*x)))
/((c + d*x)*(g + h*x)), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, h}, x] &&
NeQ[b*c - a*d, 0] && NeQ[d*g - c*h, 0]
```

Rule 2264

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))*((g_.)
 + (h_.)*(x_))^(m_), x_Symbol] :> Simp[(g + h*x)^(m + 1)*(F^(e + f*((a + b*
x)/(c + d*x)))/(h*(m + 1))), x] - Dist[f*(b*c - a*d)*(Log[F]/(h*(m + 1))),
Int[(g + h*x)^(m + 1)*(F^(e + f*((a + b*x)/(c + d*x)))/(c + d*x)^2), x], x]
 /; FreeQ[{F, a, b, c, d, e, f, g, h}, x] && NeQ[b*c - a*d, 0] && NeQ[d*g -
 c*h, 0] && ILtQ[m, -1]
```

Rule 2265

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))/(((g_.
) + (h_.)*(x_))*((i_.) + (j_.)*(x_))), x_Symbol] :> Dist[-d/(h*(d*i - c*j))
, Subst[Int[F^(e + f*((b*i - a*j)/(d*i - c*j)) - (b*c - a*d)*f*(x/(d*i - c*
j)))/x, x], x, (i + j*x)/(c + d*x)], x] /; FreeQ[{F, a, b, c, d, e, f, g, h
}, x] && EqQ[d*g - c*h, 0]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(g+hx)^3}\,dx = -\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{2h(g+hx)^2}+\frac{((bc-ad)f\log(F))\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(c+dx)^2(g+hx)^2}\,dx}{2h}$$

$$= -\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{2h(g+hx)^2}+\frac{((bc-ad)f\log(F))\int \left(\frac{d^2F^{e+\frac{f(a+bx)}{c+dx}}}{(dg-ch)^2(c+dx)^2}-\frac{2d^2F^{e+\frac{f(a+bx)}{c+dx}}h}{(dg-ch)^3(c+dx)}+\frac{F^{e+\frac{f(a+bx)}{c+dx}}h^2}{(dg-ch)^2(g+hx)^2}\right.}{2h}$$

$$= -\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{2h(g+hx)^2}-\frac{(d^2(bc-ad)f\log(F))\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{c+dx}\,dx}{(dg-ch)^3}+\frac{(d(bc-ad)fh\log(F))\int \frac{F^{e+\frac{f(}{c}}}{g+h}}{(dg-ch)^3}$$

$$= -\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{2h(g+hx)^2}-\frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{2(dg-ch)^2(g+hx)}-\frac{(d^2(bc-ad)f\log(F))\int \frac{F^{\frac{de+bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{c+dx}}{(dg-ch)^3}$$

$$= \frac{d^2F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{2h(dg-ch)^2}-\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{2h(g+hx)^2}-\frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{2(dg-ch)^2(g+hx)}+\frac{d(bc-ad)fF^{e+\frac{bf}{d}}\operatorname{Ei}\Big(}{(dg}$$

$$= \frac{d^2F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{2h(dg-ch)^2}-\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{2h(g+hx)^2}-\frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{2(dg-ch)^2(g+hx)}+\frac{d(bc-ad)fF^{e+\frac{f(bg-a}{dg-ch}}}{}$$

$$= \frac{d^2F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{2h(dg-ch)^2}-\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{2h(g+hx)^2}-\frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{2(dg-ch)^2(g+hx)}+\frac{d(bc-ad)fF^{e+\frac{f(bg-a}{dg-ch}}}{}$$

$$= \frac{d^2F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{2h(dg-ch)^2}-\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{2h(g+hx)^2}+\frac{d(bc-ad)fF^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}\log(F)}{2(dg-ch)^3}-\frac{(bc-ad)fF^{e+\frac{f(}{}}}{2(dg-ch)^2(}$$

$$= \frac{d^2F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{2h(dg-ch)^2}-\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{2h(g+hx)^2}+\frac{d(bc-ad)fF^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}\log(F)}{2(dg-ch)^3}-\frac{(bc-ad)fF^{e+\frac{f(}{}}}{2(dg-ch)^2(}$$

Mathematica [F]
time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(g+hx)^3}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^3,x]
[Out] Integrate[F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^3, x]
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 2013 vs. $2(356) = 712$.
time = 0.14, size = 2014, normalized size = 5.50

method	result	size
risch	Expression too large to display	2014

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -ln(F)*f*d^2/(c*h-d*g)^3*F^((b*f+d*e)/d)*F^(f*(a*d-b*c)/d/(d*x+c))/(f*ln(F)
/(d*x+c)*a-f*ln(F)/d/(d*x+c)*c*b+ln(F)/d*b*f+ln(F)*e-1/(c*h-d*g)*ln(F)*a*f*
h+1/(c*h-d*g)*ln(F)*b*f*g-1/(c*h-d*g)*ln(F)*c*e*h+1/(c*h-d*g)*ln(F)*d*e*g)*
a+ln(F)*f*d/(c*h-d*g)^3*F^((b*f+d*e)/d)*F^(f*(a*d-b*c)/d/(d*x+c))/(f*ln(F)/
(d*x+c)*a-f*ln(F)/d/(d*x+c)*c*b+ln(F)/d*b*f+ln(F)*e-1/(c*h-d*g)*ln(F)*a*f*h
+1/(c*h-d*g)*ln(F)*b*f*g-1/(c*h-d*g)*ln(F)*c*e*h+1/(c*h-d*g)*ln(F)*d*e*g)*c
*b-ln(F)*f*d^2/(c*h-d*g)^3*F^((a*f*h-b*f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei(1,-f*
(a*d-b*c)*ln(F)/d/(d*x+c)-(b*f+d*e)*ln(F)/d-(-ln(F)*a*f*h+ln(F)*b*f*g-ln(F)
*c*e*h+ln(F)*d*e*g)/(c*h-d*g))*a+ln(F)*f*d/(c*h-d*g)^3*F^((a*f*h-b*f*g+c*e*
h-d*e*g)/(c*h-d*g))*Ei(1,-f*(a*d-b*c)*ln(F)/d/(d*x+c)-(b*f+d*e)*ln(F)/d-(-l
n(F)*a*f*h+ln(F)*b*f*g-ln(F)*c*e*h+ln(F)*d*e*g)/(c*h-d*g))*c*b-1/2*ln(F)^2*
f^2*d^2*h/(c*h-d*g)^4*F^((b*f+d*e)/d)*F^(f*(a*d-b*c)/d/(d*x+c))/(f*ln(F)/(d
*x+c)*a-f*ln(F)/d/(d*x+c)*c*b+ln(F)/d*b*f+ln(F)*e-1/(c*h-d*g)*ln(F)*a*f*h+1
/(c*h-d*g)*ln(F)*b*f*g-1/(c*h-d*g)*ln(F)*c*e*h+1/(c*h-d*g)*ln(F)*d*e*g)^2*a
^2+ln(F)^2*f^2*d*h/(c*h-d*g)^4*F^((b*f+d*e)/d)*F^(f*(a*d-b*c)/d/(d*x+c))/(f
*ln(F)/(d*x+c)*a-f*ln(F)/d/(d*x+c)*c*b+ln(F)/d*b*f+ln(F)*e-1/(c*h-d*g)*ln(F
)*a*f*h+1/(c*h-d*g)*ln(F)*b*f*g-1/(c*h-d*g)*ln(F)*c*e*h+1/(c*h-d*g)*ln(F)*d
*e*g)^2*a*c*b-1/2*ln(F)^2*f^2*h/(c*h-d*g)^4*F^((b*f+d*e)/d)*F^(f*(a*d-b*c)/
d/(d*x+c))/(f*ln(F)/(d*x+c)*a-f*ln(F)/d/(d*x+c)*c*b+ln(F)/d*b*f+ln(F)*e-1/(
c*h-d*g)*ln(F)*a*f*h+1/(c*h-d*g)*ln(F)*b*f*g-1/(c*h-d*g)*ln(F)*c*e*h+1/(c*h
-d*g)*ln(F)*d*e*g)^2*c^2*b^2-1/2*ln(F)^2*f^2*d^2*h/(c*h-d*g)^4*F^((b*f+d*e)
/d)*F^(f*(a*d-b*c)/d/(d*x+c))/(f*ln(F)/(d*x+c)*a-f*ln(F)/d/(d*x+c)*c*b+ln(F
)/d*b*f+ln(F)*e-1/(c*h-d*g)*ln(F)*a*f*h+1/(c*h-d*g)*ln(F)*b*f*g-1/(c*h-d*g)
*ln(F)*c*e*h+1/(c*h-d*g)*ln(F)*d*e*g)*a^2+ln(F)^2*f^2*d*h/(c*h-d*g)^4*F^((b
*f+d*e)/d)*F^(f*(a*d-b*c)/d/(d*x+c))/(f*ln(F)/(d*x+c)*a-f*ln(F)/d/(d*x+c)*c
*b+ln(F)/d*b*f+ln(F)*e-1/(c*h-d*g)*ln(F)*a*f*h+1/(c*h-d*g)*ln(F)*b*f*g-1/(c
*h-d*g)*ln(F)*c*e*h+1/(c*h-d*g)*ln(F)*d*e*g)*a*c*b-1/2*ln(F)^2*f^2*h/(c*h-d
*g)^4*F^((b*f+d*e)/d)*F^(f*(a*d-b*c)/d/(d*x+c))/(f*ln(F)/(d*x+c)*a-f*ln(F)/
d/(d*x+c)*c*b+ln(F)/d*b*f+ln(F)*e-1/(c*h-d*g)*ln(F)*a*f*h+1/(c*h-d*g)*ln(F)
*b*f*g-1/(c*h-d*g)*ln(F)*c*e*h+1/(c*h-d*g)*ln(F)*d*e*g)*c^2*b^2-1/2*ln(F)^2
*f^2*d^2*h/(c*h-d*g)^4*F^((a*f*h-b*f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei(1,-f*(a*d
-b*c)*ln(F)/d/(d*x+c)-(b*f+d*e)*ln(F)/d-(-ln(F)*a*f*h+ln(F)*b*f*g-ln(F)*c*e
*h+ln(F)*d*e*g)/(c*h-d*g))*a^2+ln(F)^2*f^2*d*h/(c*h-d*g)^4*F^((a*f*h-b*f*g+
c*e*h-d*e*g)/(c*h-d*g))*Ei(1,-f*(a*d-b*c)*ln(F)/d/(d*x+c)-(b*f+d*e)*ln(F)/d
```

```
-(-ln(F)*a*f*h+ln(F)*b*f*g-ln(F)*c*e*h+ln(F)*d*e*g)/(c*h-d*g))*a*c*b-1/2*ln
(F)^2*f^2*h/(c*h-d*g)^4*F^((a*f*h-b*f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei(1,-f*(a*
d-b*c)*ln(F)/d/(d*x+c)-(b*f+d*e)*ln(F)/d-(-ln(F)*a*f*h+ln(F)*b*f*g-ln(F)*c*
e*h+ln(F)*d*e*g)/(c*h-d*g))*c^2*b^2
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g)^3,x, algorithm="maxima")
```

```
[Out] integrate(F^(e + (b*x + a)*f/(d*x + c))/(h*x + g)^3, x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 756 vs. 2(362) = 724.
time = 0.41, size = 756, normalized size = 2.07

$$\frac{\left(\left(\left(b^2c^2-2\,abcd+a^2d^2\right)f^2h^3x^2+2\left(b^2c^2-2\,abcd+a^2d^2\right)f^2gh^2x+\left(b^2c^2-2\,abcd+a^2d^2\right)f^2g^2h\right)\log\left(F\right)^2+2\left(\left(bcd^2-ad^3\right)fg^3-\left(bc^2d-acd^2\right)fg^2h+\left(\left(bcd^2-ad^3\right)fgh^2-\left(bc^2d-acd^2\right)fh^3\right)x^2+2\left(\left(bcd^2-ad^3\right)fg^2h-\left(bc^2d-acd^2\right)fgh^2\right)x\right)\log\left(F\right)\right)F^{\frac{bfg-afh+(dg-ch)e}{dg-ch}}\mathrm{Ei}\left(-\frac{\left(\left(bc-ad\right)fhx+\left(bc-ad\right)fg\right)\log\left(F\right)}{cdg-c^2h+\left(d^2g-cdh\right)x}\right)+\left(2\,cd^3g^3-5\,c^2d^2g^2h+4\,c^3dgh^2-c^4h^3+\left(d^4g^2h-2\,cd^3gh^2+c^2d^2h^3\right)x^2+2\left(d^4g^3-2\,cd^3g^2h+c^2d^2gh^2\right)x+\left(\left(bc^2d-acd^2\right)fg^2h-\left(bc^3-ac^2d\right)fgh^2+\left(\left(bcd^2-ad^3\right)fgh^2-\left(bc^2d-acd^2\right)fh^3\right)x^2+\left(\left(bcd^2-ad^3\right)fg^2h-\left(bc^3-ac^2d\right)fh^3\right)x\right)\log\left(F\right)\right)F^{\frac{bfx+af+(dx+c)e}{dx+c}}}{2\left(d^4g^6-4\,cd^3g^5h+6\,c^2d^2g^4h^2-4\,c^3dg^3h^3+c^4g^2h^4+\left(d^4g^4h^2-4\,cd^3g^3h^3+6\,c^2d^2g^2h^4-4\,c^3dgh^5+c^4h^6\right)x^2+2\left(d^4g^5h-4\,cd^3g^4h^2+6\,c^2d^2g^3h^3-4\,c^3dg^2h^4+c^4gh^5\right)x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g)^3,x, algorithm="fricas")
```

```
[Out] 1/2*((((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*f^2*h^3*x^2 + 2*(b^2*c^2 - 2*a*b*c*d
 + a^2*d^2)*f^2*g*h^2*x + (b^2*c^2 - 2*a*b*c*d + a^2*d^2)*f^2*g^2*h)*log(F)
^2 + 2*((b*c*d^2 - a*d^3)*f*g^3 - (b*c^2*d - a*c*d^2)*f*g^2*h + ((b*c*d^2 -
 a*d^3)*f*g*h^2 - (b*c^2*d - a*c*d^2)*f*h^3)*x^2 + 2*((b*c*d^2 - a*d^3)*f*g
^2*h - (b*c^2*d - a*c*d^2)*f*g*h^2)*x)*log(F))*F^((b*f*g - a*f*h + (d*g - c
*h)*e)/(d*g - c*h))*Ei(-((b*c - a*d)*f*h*x + (b*c - a*d)*f*g)*log(F)/(c*d*g
 - c^2*h + (d^2*g - c*d*h)*x)) + (2*c*d^3*g^3 - 5*c^2*d^2*g^2*h + 4*c^3*d*g
*h^2 - c^4*h^3 + (d^4*g^2*h - 2*c*d^3*g*h^2 + c^2*d^2*h^3)*x^2 + 2*(d^4*g^3
 - 2*c*d^3*g^2*h + c^2*d^2*g*h^2)*x + ((b*c^2*d - a*c*d^2)*f*g^2*h - (b*c^3
 - a*c^2*d)*f*g*h^2 + ((b*c*d^2 - a*d^3)*f*g*h^2 - (b*c^2*d - a*c*d^2)*f*h^
3)*x^2 + ((b*c*d^2 - a*d^3)*f*g^2*h - (b*c^3 - a*c^2*d)*f*h^3)*x)*log(F))*F
^((b*f*x + a*f + (d*x + c)*e)/(d*x + c)))/(d^4*g^6 - 4*c*d^3*g^5*h + 6*c^2*
d^2*g^4*h^2 - 4*c^3*d*g^3*h^3 + c^4*g^2*h^4 + (d^4*g^4*h^2 - 4*c*d^3*g^3*h^
3 + 6*c^2*d^2*g^2*h^4 - 4*c^3*d*g*h^5 + c^4*h^6)*x^2 + 2*(d^4*g^5*h - 4*c*d
^3*g^4*h^2 + 6*c^2*d^2*g^3*h^3 - 4*c^3*d*g^2*h^4 + c^4*g*h^5)*x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(e+f*(b*x+a)/(d*x+c))/(h*x+g)**3,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g)^3,x, algorithm="giac")
```

```
[Out] integrate(F^((b*x + a)*f/(d*x + c) + e)/(h*x + g)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{F^{e+\frac{f\,(a+b\,x)}{c+d\,x}}}{{(g+h\,x)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^3,x)
```

```
[Out] int(F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^3, x)
```

3.425 $\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(g+hx)^4}\,dx$

Optimal. Leaf size=634

$$\frac{d^3F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{3h(dg-ch)^3}-\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3}+\frac{5d^2(bc-ad)fF^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}\log(F)}{6(dg-ch)^4}-\frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{6(dg-ch)^2(g+hx)^2}-\frac{2d(bc-}{3(}$$

```
[Out] 1/3*d^3*F^(e+b*f/d-(-a*d+b*c)*f/d/(d*x+c))/h/(-c*h+d*g)^3-1/3*F^(e+f*(b*x+a
)/(d*x+c))/h/(h*x+g)^3+5/6*d^2*(-a*d+b*c)*f*F^(e+b*f/d-(-a*d+b*c)*f/d/(d*x+
c))*ln(F)/(-c*h+d*g)^4-1/6*(-a*d+b*c)*f*F^(e+f*(b*x+a)/(d*x+c))*ln(F)/(-c*h
+d*g)^2/(h*x+g)^2-2/3*d*(-a*d+b*c)*f*F^(e+f*(b*x+a)/(d*x+c))*ln(F)/(-c*h+d*
g)^3/(h*x+g)+d^2*(-a*d+b*c)*f*F^(e+f*(-a*h+b*g)/(-c*h+d*g))*Ei(-(-a*d+b*c)*
f*(h*x+g)*ln(F)/(-c*h+d*g)/(d*x+c))*ln(F)/(-c*h+d*g)^4+1/6*d*(-a*d+b*c)^2*f
^2*F^(e+b*f/d-(-a*d+b*c)*f/d/(d*x+c))*h*ln(F)^2/(-c*h+d*g)^5-1/6*(-a*d+b*c)
^2*f^2*F^(e+f*(b*x+a)/(d*x+c))*h*ln(F)^2/(-c*h+d*g)^4/(h*x+g)+d*(-a*d+b*c)^
2*f^2*F^(e+f*(-a*h+b*g)/(-c*h+d*g))*h*Ei(-(-a*d+b*c)*f*(h*x+g)*ln(F)/(-c*h+
d*g)/(d*x+c))*ln(F)^2/(-c*h+d*g)^5+1/6*(-a*d+b*c)^3*f^3*F^(e+f*(-a*h+b*g)/(
-c*h+d*g))*h^2*Ei(-(-a*d+b*c)*f*(h*x+g)*ln(F)/(-c*h+d*g)/(d*x+c))*ln(F)^3/(
-c*h+d*g)^6
```

Rubi [A]
time = 6.47, antiderivative size = 634, normalized size of antiderivative = 1.00, number of steps used = 48, number of rules used = 8, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$, Rules used = {2264, 6874, 2262, 2240, 2241, 2263, 2265, 2209}

$$\frac{d^3F^{-\frac{f(bc-ad)}{d(c+dx)}+\frac{bf}{d}+e}}{3h(dg-ch)^3}+\frac{d^2f\log(F)(bc-ad)F^{\frac{f(bg-ah)}{dg-ch}+e}\text{Ei}\left(-\frac{(bc-ad)f(g+hx)\log(F)}{(dg-ch)(c+dx)}\right)}{(dg-ch)^4}+\frac{5d^2f\log(F)(bc-ad)F^{-\frac{f(bc-ad)}{d(c+dx)}+\frac{bf}{d}+e}}{6(dg-ch)^4}+\frac{f^3h^2\log^3(F)(bc-ad)^3F^{\frac{f(bg-ah)}{dg-ch}+e}\text{Ei}\left(-\frac{(bc-ad)f(g+hx)\log(F)}{(dg-ch)(c+dx)}\right)}{6(dg-ch)^6}+\frac{df^2h\log^2(F)(bc-ad)^2F^{\frac{f(bg-ah)}{dg-ch}+e}\text{Ei}\left(-\frac{(bc-ad)f(g+hx)\log(F)}{(dg-ch)(c+dx)}\right)}{(dg-ch)^5}+\frac{df^2h\log^2(F)(bc-ad)^2F^{-\frac{f(bc-ad)}{d(c+dx)}+\frac{bf}{d}+e}}{6(dg-ch)^5}-\frac{f^2h\log^2(F)(bc-ad)^2F^{\frac{f(a+bx)}{c+dx}+e}}{6(g+hx)(dg-ch)^4}-\frac{F^{\frac{f(a+bx)}{c+dx}+e}}{3h(g+hx)^3}-\frac{2df\log(F)(bc-ad)F^{\frac{f(a+bx)}{c+dx}+e}}{3(g+hx)(dg-ch)^3}-\frac{f\log(F)(bc-ad)F^{\frac{f(a+bx)}{c+dx}+e}}{6(g+hx)^2(dg-ch)^2}$$

Antiderivative was successfully verified.

```
[In] Int[F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^4,x]
```

```
[Out] (d^3*F^(e + (b*f)/d - ((b*c - a*d)*f)/(d*(c + d*x))))/(3*h*(d*g - c*h)^3) -
 F^(e + (f*(a + b*x))/(c + d*x))/(3*h*(g + h*x)^3) + (5*d^2*(b*c - a*d)*f*F
^(e + (b*f)/d - ((b*c - a*d)*f)/(d*(c + d*x)))*Log[F])/(6*(d*g - c*h)^4) -
((b*c - a*d)*f*F^(e + (f*(a + b*x))/(c + d*x))*Log[F])/(6*(d*g - c*h)^2*(g
+ h*x)^2) - (2*d*(b*c - a*d)*f*F^(e + (f*(a + b*x))/(c + d*x))*Log[F])/(3*(
d*g - c*h)^3*(g + h*x)) + (d^2*(b*c - a*d)*f*F^(e + (f*(b*g - a*h))/(d*g -
c*h))*ExpIntegralEi[-(((b*c - a*d)*f*(g + h*x)*Log[F])/((d*g - c*h)*(c + d*
x)))]*Log[F])/(d*g - c*h)^4 + (d*(b*c - a*d)^2*f^2*F^(e + (b*f)/d - ((b*c -
 a*d)*f)/(d*(c + d*x)))*h*Log[F]^2)/(6*(d*g - c*h)^5) - ((b*c - a*d)^2*f^2*
F^(e + (f*(a + b*x))/(c + d*x))*h*Log[F]^2)/(6*(d*g - c*h)^4*(g + h*x)) + (
d*(b*c - a*d)^2*f^2*F^(e + (f*(b*g - a*h))/(d*g - c*h))*h*ExpIntegralEi[-((
(b*c - a*d)*f*(g + h*x)*Log[F])/((d*g - c*h)*(c + d*x)))]*Log[F]^2)/(d*g -
c*h)^5 + ((b*c - a*d)^3*f^3*F^(e + (f*(b*g - a*h))/(d*g - c*h))*h^2*ExpInte
```

```
gralEi[-(((b*c - a*d)*f*(g + h*x)*Log[F])/((d*g - c*h)*(c + d*x)))]*Log[F]^
3)/(6*(d*g - c*h)^6)
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[F^a*(ExpIntegralEi[b*(c + d*x)^n*Log[F]]/(f*n)), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2262

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))*((g_.)
 + (h_.)*(x_))^(m_.), x_Symbol] :> Int[(g + h*x)^m*F^((d*e + b*f)/d - f*((b
*c - a*d)/(d*(c + d*x)))), x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m}, x] &
& NeQ[b*c - a*d, 0] && EqQ[d*g - c*h, 0]
```

Rule 2263

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))/((g_.)
 + (h_.)*(x_)), x_Symbol] :> Dist[d/h, Int[F^(e + f*((a + b*x)/(c + d*x)))/
(c + d*x), x], x] - Dist[(d*g - c*h)/h, Int[F^(e + f*((a + b*x)/(c + d*x)))
/((c + d*x)*(g + h*x)), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, h}, x] &&
NeQ[b*c - a*d, 0] && NeQ[d*g - c*h, 0]
```

Rule 2264

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))*((g_.)
 + (h_.)*(x_))^(m_), x_Symbol] :> Simp[(g + h*x)^(m + 1)*(F^(e + f*((a + b*
x)/(c + d*x)))/(h*(m + 1))), x] - Dist[f*(b*c - a*d)*(Log[F]/(h*(m + 1))),
Int[(g + h*x)^(m + 1)*(F^(e + f*((a + b*x)/(c + d*x)))/(c + d*x)^2), x], x]
 /; FreeQ[{F, a, b, c, d, e, f, g, h}, x] && NeQ[b*c - a*d, 0] && NeQ[d*g -
 c*h, 0] && ILtQ[m, -1]
```

Rule 2265

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))/(((g_.
) + (h_.)*(x_))*((i_.) + (j_.)*(x_))), x_Symbol] :> Dist[-d/(h*(d*i - c*j))
, Subst[Int[F^(e + f*((b*i - a*j)/(d*i - c*j)) - (b*c - a*d)*f*(x/(d*i - c*
j)))/x, x], x, (i + j*x)/(c + d*x)], x] /; FreeQ[{F, a, b, c, d, e, f, g, h
}, x] && EqQ[d*g - c*h, 0]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(g+hx)^4}\,dx = -\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3}+\frac{((bc-ad)f\log(F))\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(c+dx)^2(g+hx)^3}\,dx}{3h}$$

$$= -\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3}+\frac{((bc-ad)f\log(F))\int \left(\frac{d^3F^{e+\frac{f(a+bx)}{c+dx}}}{(dg-ch)^3(c+dx)^2}-\frac{3d^3F^{e+\frac{f(a+bx)}{c+dx}}h}{(dg-ch)^4(c+dx)}+\frac{F^{e+\frac{f(a+bx)}{c+dx}}h^2}{(dg-ch)^2(g+hx)^3}+\right.}{3h}$$

$$= -\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3}-\frac{(d^3(bc-ad)f\log(F))\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{c+dx}\,dx}{(dg-ch)^4}+\frac{(d^2(bc-ad)fh\log(F))\int \frac{F^{e+\frac{f(a}{c-}}}{g+h}}{(dg-ch)^4}$$

$$= -\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3}-\frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{6(dg-ch)^2(g+hx)^2}-\frac{2d(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{3(dg-ch)^3(g+hx)}-\frac{(d^3(bc}{}$$

$$= \frac{d^3F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{3h(dg-ch)^3}-\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3}-\frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{6(dg-ch)^2(g+hx)^2}-\frac{2d(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}}{3(dg-ch)^3(g+h}$$

$$= \frac{d^3F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{3h(dg-ch)^3}-\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3}-\frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{6(dg-ch)^2(g+hx)^2}-\frac{2d(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}}{3(dg-ch)^3(g+h}$$

$$= \frac{d^3F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{3h(dg-ch)^3}-\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3}-\frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{6(dg-ch)^2(g+hx)^2}-\frac{2d(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}}{3(dg-ch)^3(g+h}$$

$$= \frac{d^3F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{3h(dg-ch)^3}-\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3}+\frac{5d^2(bc-ad)fF^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}\log(F)}{6(dg-ch)^4}-\frac{(bc-ad)fF^{e+}}{6(dg-ch)^2(}$$

$$= \frac{d^3F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{3h(dg-ch)^3}-\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3}+\frac{5d^2(bc-ad)fF^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}\log(F)}{6(dg-ch)^4}-\frac{(bc-ad)fF^{e+}}{6(dg-ch)^2(}$$

$$= \frac{d^3F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{3h(dg-ch)^3}-\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3}+\frac{5d^2(bc-ad)fF^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}\log(F)}{6(dg-ch)^4}-\frac{(bc-ad)fF^{e+}}{6(dg-ch)^2(}$$

$$= \frac{d^3F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{3h(dg-ch)^3}-\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3}+\frac{5d^2(bc-ad)fF^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}\log(F)}{6(dg-ch)^4}-\frac{(bc-ad)fF^{e+}}{6(dg-ch)^2(}$$

$$= \frac{d^3F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{3h(dg-ch)^3}-\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3}+\frac{5d^2(bc-ad)fF^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}\log(F)}{6(dg-ch)^4}-\frac{(bc-ad)fF^{e+}}{6(dg-ch)^2(}$$

Mathematica [F]

time = 0.32, size = 0, normalized size = 0.00

$$\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(g+hx)^4}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^4,x]
```

```
[Out] Integrate[F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^4, x]
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 4670 vs. $2(618) = 1236$.
time = 0.16, size = 4671, normalized size = 7.37

method	result	size
risch	Expression too large to display	4671

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g)^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/6*ln(F)^3*f^3*d^3*h^2/(c*h-d*g)^6*F^((a*f*h-b*f*g+c*e*h-d*e*g)/(c*h-d*g))
*Ei(1,-f*(a*d-b*c)*ln(F)/d/(d*x+c)-(b*f+d*e)*ln(F)/d-(-ln(F)*a*f*h+ln(F)*b*
f*g-ln(F)*c*e*h+ln(F)*d*e*g)/(c*h-d*g))*a^3+ln(F)^2*f^2*d^3*h/(c*h-d*g)^5*F
^((a*f*h-b*f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei(1,-f*(a*d-b*c)*ln(F)/d/(d*x+c)-(b
*f+d*e)*ln(F)/d-(-ln(F)*a*f*h+ln(F)*b*f*g-ln(F)*c*e*h+ln(F)*d*e*g)/(c*h-d*g
))*a^2+ln(F)*f*d^3/(c*h-d*g)^4*F^((b*f+d*e)/d)*F^(f*(a*d-b*c)/d/(d*x+c))/(f
*ln(F)/(d*x+c)*a-f*ln(F)/d/(d*x+c)*c*b+ln(F)/d*b*f+ln(F)*e-1/(c*h-d*g)*ln(F
)*a*f*h+1/(c*h-d*g)*ln(F)*b*f*g-1/(c*h-d*g)*ln(F)*c*e*h+1/(c*h-d*g)*ln(F)*d
*e*g)*a-ln(F)*f*d^2/(c*h-d*g)^4*F^((a*f*h-b*f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei(
1,-f*(a*d-b*c)*ln(F)/d/(d*x+c)-(b*f+d*e)*ln(F)/d-(-ln(F)*a*f*h+ln(F)*b*f*g-
ln(F)*c*e*h+ln(F)*d*e*g)/(c*h-d*g))*c*b-1/6*ln(F)^3*f^3*h^2/(c*h-d*g)^6*F^(
(a*f*h-b*f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei(1,-f*(a*d-b*c)*ln(F)/d/(d*x+c)-(b*f
+d*e)*ln(F)/d-(-ln(F)*a*f*h+ln(F)*b*f*g-ln(F)*c*e*h+ln(F)*d*e*g)/(c*h-d*g))
*b^3*c^3+ln(F)*f*d^3/(c*h-d*g)^4*F^((a*f*h-b*f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei
(1,-f*(a*d-b*c)*ln(F)/d/(d*x+c)-(b*f+d*e)*ln(F)/d-(-ln(F)*a*f*h+ln(F)*b*f*g
-ln(F)*c*e*h+ln(F)*d*e*g)/(c*h-d*g))*a-ln(F)*f*d^2/(c*h-d*g)^4*F^((b*f+d*e)
/d)*F^(f*(a*d-b*c)/d/(d*x+c))/(f*ln(F)/(d*x+c)*a-f*ln(F)/d/(d*x+c)*c*b+ln(F
)/d*b*f+ln(F)*e-1/(c*h-d*g)*ln(F)*a*f*h+1/(c*h-d*g)*ln(F)*b*f*g-1/(c*h-d*g)
*ln(F)*c*e*h+1/(c*h-d*g)*ln(F)*d*e*g)*c*b+ln(F)^2*f^2*d^3*h/(c*h-d*g)^5*F^(
(b*f+d*e)/d)*F^(f*(a*d-b*c)/d/(d*x+c))/(f*ln(F)/(d*x+c)*a-f*ln(F)/d/(d*x+c)
*c*b+ln(F)/d*b*f+ln(F)*e-1/(c*h-d*g)*ln(F)*a*f*h+1/(c*h-d*g)*ln(F)*b*f*g-1/
(c*h-d*g)*ln(F)*c*e*h+1/(c*h-d*g)*ln(F)*d*e*g)*a^2+ln(F)^2*f^2*d*h/(c*h-d*g
)^5*F^((a*f*h-b*f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei(1,-f*(a*d-b*c)*ln(F)/d/(d*x+
c)-(b*f+d*e)*ln(F)/d-(-ln(F)*a*f*h+ln(F)*b*f*g-ln(F)*c*e*h+ln(F)*d*e*g)/(c*
h-d*g))*c^2*b^2+1/3*ln(F)^3*f^3*d^3*h^2/(c*h-d*g)^6*F^((b*f+d*e)/d)*F^(f*(a
```

```
*d-b*c)/d/(d*x+c))/(f*ln(F)/(d*x+c)*a-f*ln(F)/d/(d*x+c)*c*b+ln(F)/d*b*f+ln(
F)*e-1/(c*h-d*g)*ln(F)*a*f*h+1/(c*h-d*g)*ln(F)*b*f*g-1/(c*h-d*g)*ln(F)*c*e*
h+1/(c*h-d*g)*ln(F)*d*e*g)^3*a^3+1/6*ln(F)^3*f^3*d^3*h^2/(c*h-d*g)^6*F^((b*
f+d*e)/d)*F^(f*(a*d-b*c)/d/(d*x+c))/(f*ln(F)/(d*x+c)*a-f*ln(F)/d/(d*x+c)*c*
b+ln(F)/d*b*f+ln(F)*e-1/(c*h-d*g)*ln(F)*a*f*h+1/(c*h-d*g)*ln(F)*b*f*g-1/(c*
h-d*g)*ln(F)*c*e*h+1/(c*h-d*g)*ln(F)*d*e*g)^2*a^3+1/6*ln(F)^3*f^3*d^3*h^2/(
c*h-d*g)^6*F^((b*f+d*e)/d)*F^(f*(a*d-b*c)/d/(d*x+c))/(f*ln(F)/(d*x+c)*a-f*l
n(F)/d/(d*x+c)*c*b+ln(F)/d*b*f+ln(F)*e-1/(c*h-d*g)*ln(F)*a*f*h+1/(c*h-d*g)*
ln(F)*b*f*g-1/(c*h-d*g)*ln(F)*c*e*h+1/(c*h-d*g)*ln(F)*d*e*g)*a^3+ln(F)^2*f^
2*d^3*h/(c*h-d*g)^5*F^((b*f+d*e)/d)*F^(f*(a*d-b*c)/d/(d*x+c))/(f*ln(F)/(d*x
+c)*a-f*ln(F)/d/(d*x+c)*c*b+ln(F)/d*b*f+ln(F)*e-1/(c*h-d*g)*ln(F)*a*f*h+1/(
c*h-d*g)*ln(F)*b*f*g-1/(c*h-d*g)*ln(F)*c*e*h+1/(c*h-d*g)*ln(F)*d*e*g)^2*a^2
-1/3*ln(F)^3*f^3*h^2/(c*h-d*g)^6*F^((b*f+d*e)/d)*F^(f*(a*d-b*c)/d/(d*x+c))/
(f*ln(F)/(d*x+c)*a-f*ln(F)/d/(d*x+c)*c*b+ln(F)/d*b*f+ln(F)*e-1/(c*h-d*g)*ln
(F)*a*f*h+1/(c*h-d*g)*ln(F)*b*f*g-1/(c*h-d*g)*ln(F)*c*e*h+1/(c*h-d*g)*ln(F)
*d*e*g)^3*b^3*c^3-1/6*ln(F)^3*f^3*h^2/(c*h-d*g)^6*F^((b*f+d*e)/d)*F^(f*(a*d
-b*c)/d/(d*x+c))/(f*ln(F)/(d*x+c)*a-f*ln(F)/d/(d*x+c)*c*b+ln(F)/d*b*f+ln(F)
*e-1/(c*h-d*g)*ln(F)*a*f*h+1/(c*h-d*g)*ln(F)*b*f*g-1/(c*h-d*g)*ln(F)*c*e*h+
1/(c*h-d*g)*ln(F)*d*e*g)^2*b^3*c^3-1/6*ln(F)^3*f^3*h^2/(c*h-d*g)^6*F^((b*f+
d*e)/d)*F^(f*(a*d-b*c)/d/(d*x+c))/(f*ln(F)/(d*x+c)*a-f*ln(F)/d/(d*x+c)*c*b+
ln(F)/d*b*f+ln(F)*e-1/(c*h-d*g)*ln(F)*a*f*h+1/(c*h-d*g)*ln(F)*b*f*g-1/(c*h-
d*g)*ln(F)*c*e*h+1/(c*h-d*g)*ln(F)*d*e*g)*b^3*c^3-ln(F)^3*f^3*d^2*h^2/(c*h-
d*g)^6*F^((b*f+d*e)/d)*F^(f*(a*d-b*c)/d/(d*x+c))/(f*ln(F)/(d*x+c)*a-f*ln(F)
/d/(d*x+c)*c*b+ln(F)/d*b*f+ln(F)*e-1/(c*h-d*g)*ln(F)*a*f*h+1/(c*h-d*g)*ln(F
)*b*f*g-1/(c*h-d*g)*ln(F)*c*e*h+1/(c*h-d*g)*ln(F)*d*e*g)^3*a^2*c*b+ln(F)^3*
f^3*d*h^2/(c*h-d*g)^6*F^((b*f+d*e)/d)*F^(f*(a*d-b*c)/d/(d*x+c))/(f*ln(F)/(d
*x+c)*a-f*ln(F)/d/(d*x+c)*c*b+ln(F)/d*b*f+ln(F)*e-1/(c*h-d*g)*ln(F)*a*f*h+1
/(c*h-d*g)*ln(F)*b*f*g-1/(c*h-d*g)*ln(F)*c*e*h+1/(c*h-d*g)*ln(F)*d*e*g)^3*a
*b^2*c^2-1/2*ln(F)^3*f^3*d^2*h^2/(c*h-d*g)^6*F^((b*f+d*e)/d)*F^(f*(a*d-b*c)
/d/(d*x+c))/(f*ln(F)/(d*x+c)*a-f*ln(F)/d/(d*x+c)*c*b+ln(F)/d*b*f+ln(F)*e-1/
(c*h-d*g)*ln(F)*a*f*h+1/(c*h-d*g)*ln(F)*b*f*g-1/(c*h-d*g)*ln(F)*c*e*h+1/(c*
h-d*g)*ln(F)*d*e*g)^2*a^2*c*b+1/2*ln(F)^3*f^3*d*h^2/(c*h-d*g)^6*F^((b*f+d*e
)/d)*F^(f*(a*d-b*c)/d/(d*x+c))/(f*ln(F)/(d*x+c)*a-f*ln(F)/d/(d*x+c)*c*b+ln(
F)/d*b*f+ln(F)*e-1/(c*h-d*g)*ln(F)*a*f*h+1/(c*h-d*g)*ln(F)*b*f*g-1/(c*h-d*g
)*ln(F)*c*e*h+1/(c*h-d*g)*ln(F)*d*e*g)^2*a*b^2*c^2-1/2*ln(F)^3*f^3*d^2*h^2/
(c*h-d*g)^6*F^((b*f+d*e)/d)*F^(f*(a*d-b*c)/d/(d*x+c))/(f*ln(F)/(d*x+c)*a-f*
ln(F)/d/(d*x+c)*c*b+ln(F)/d*b*f+ln(F)*e-1/(c*h-d*g)*ln(F)*a*f*h+1/(c*h-d*g)
*ln(F)*b*f*g-1/(c*h-d*g)*ln(F)*c*e*h+1/(c*h-d*g)*ln(F)*d*e*g)*a^2*c*b+1/2*l
n(F)^3*f^3*d*h^2/(c*h-d*g)^6*F^((b*f+d*e)/d)*F^(f*(a*d-b*c)/d/(d*x+c))/(f*l
n(F)/(d*x+c)*a-f*ln(F)/d/(d*x+c)*c*b+ln(F)/d*b*f+ln(F)*e-1/(c*h-d*g)*ln(F)*
a*f*h+1/(c*h-d*g)*ln(F)*b*f*g-1/(c*h-d*g)*ln(F)*c*e*h+1/(c*h-d*g)*ln(F)*d*e
*g)*a*b^2*c^2-2*ln(F)^2*f^2*d^2*h/(c*h-d*g)^5*F...
```

Maxima [F]

time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g)^4,x, algorithm="maxima")
```

```
[Out] integrate(F^(e + (b*x + a)*f/(d*x + c))/(h*x + g)^4, x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 2251 vs. 2(628) = 1256.
time = 0.44, size = 2251, normalized size = 3.55

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g)^4,x, algorithm="fricas")
```

```
[Out] 1/6*((((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*f^3*h^5*x^3 + 3*
(b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*f^3*g*h^4*x^2 + 3*(b^3*
c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*f^3*g^2*h^3*x + (b^3*c^3 - 3
*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*f^3*g^3*h^2)*log(F)^3 + 6*((b^2*c^2
*d^2 - 2*a*b*c*d^3 + a^2*d^4)*f^2*g^4*h - (b^2*c^3*d - 2*a*b*c^2*d^2 + a^2*
c*d^3)*f^2*g^3*h^2 + ((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*f^2*g*h^4 - (b^
2*c^3*d - 2*a*b*c^2*d^2 + a^2*c*d^3)*f^2*h^5)*x^3 + 3*((b^2*c^2*d^2 - 2*a*b
*c*d^3 + a^2*d^4)*f^2*g^2*h^3 - (b^2*c^3*d - 2*a*b*c^2*d^2 + a^2*c*d^3)*f^2
*g*h^4)*x^2 + 3*((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*f^2*g^3*h^2 - (b^2*c
^3*d - 2*a*b*c^2*d^2 + a^2*c*d^3)*f^2*g^2*h^3)*x)*log(F)^2 + 6*((b*c*d^4 -
a*d^5)*f*g^5 - 2*(b*c^2*d^3 - a*c*d^4)*f*g^4*h + (b*c^3*d^2 - a*c^2*d^3)*f*
g^3*h^2 + ((b*c*d^4 - a*d^5)*f*g^2*h^3 - 2*(b*c^2*d^3 - a*c*d^4)*f*g*h^4 +
(b*c^3*d^2 - a*c^2*d^3)*f*h^5)*x^3 + 3*((b*c*d^4 - a*d^5)*f*g^3*h^2 - 2*(b*
c^2*d^3 - a*c*d^4)*f*g^2*h^3 + (b*c^3*d^2 - a*c^2*d^3)*f*g*h^4)*x^2 + 3*((b
*c*d^4 - a*d^5)*f*g^4*h - 2*(b*c^2*d^3 - a*c*d^4)*f*g^3*h^2 + (b*c^3*d^2 -
a*c^2*d^3)*f*g^2*h^3)*x)*log(F))*F^((b*f*g - a*f*h + (d*g - c*h)*e)/(d*g -
c*h))*Ei(-((b*c - a*d)*f*h*x + (b*c - a*d)*f*g)*log(F)/(c*d*g - c^2*h + (d^
2*g - c*d*h)*x)) + (6*c*d^5*g^5 - 24*c^2*d^4*g^4*h + 38*c^3*d^3*g^3*h^2 - 3
0*c^4*d^2*g^2*h^3 + 12*c^5*d*g*h^4 - 2*c^6*h^5 + 2*(d^6*g^3*h^2 - 3*c*d^5*g
^2*h^3 + 3*c^2*d^4*g*h^4 - c^3*d^3*h^5)*x^3 + 6*(d^6*g^4*h - 3*c*d^5*g^3*h^
2 + 3*c^2*d^4*g^2*h^3 - c^3*d^3*g*h^4)*x^2 + ((b^2*c^3*d - 2*a*b*c^2*d^2 +
a^2*c*d^3)*f^2*g^3*h^2 - (b^2*c^4 - 2*a*b*c^3*d + a^2*c^2*d^2)*f^2*g^2*h^3
+ ((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*f^2*g*h^4 - (b^2*c^3*d - 2*a*b*c^2
*d^2 + a^2*c*d^3)*f^2*h^5)*x^3 + (2*(b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*f
^2*g^2*h^3 - (b^2*c^3*d - 2*a*b*c^2*d^2 + a^2*c*d^3)*f^2*g*h^4 - (b^2*c^4 -
 2*a*b*c^3*d + a^2*c^2*d^2)*f^2*h^5)*x^2 + ((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^
2*d^4)*f^2*g^3*h^2 + (b^2*c^3*d - 2*a*b*c^2*d^2 + a^2*c*d^3)*f^2*g^2*h^3 -
```

```
2*(b^2*c^4 - 2*a*b*c^3*d + a^2*c^2*d^2)*f^2*g*h^4)*x)*log(F)^2 + 6*(d^6*g^5
 - 3*c*d^5*g^4*h + 3*c^2*d^4*g^3*h^2 - c^3*d^3*g^2*h^3)*x + (6*(b*c^2*d^3 -
 a*c*d^4)*f*g^4*h - 13*(b*c^3*d^2 - a*c^2*d^3)*f*g^3*h^2 + 8*(b*c^4*d - a*c
^3*d^2)*f*g^2*h^3 - (b*c^5 - a*c^4*d)*f*g*h^4 + 5*((b*c*d^4 - a*d^5)*f*g^2*
h^3 - 2*(b*c^2*d^3 - a*c*d^4)*f*g*h^4 + (b*c^3*d^2 - a*c^2*d^3)*f*h^5)*x^3
+ (11*(b*c*d^4 - a*d^5)*f*g^3*h^2 - 18*(b*c^2*d^3 - a*c*d^4)*f*g^2*h^3 + 3*
(b*c^3*d^2 - a*c^2*d^3)*f*g*h^4 + 4*(b*c^4*d - a*c^3*d^2)*f*h^5)*x^2 + (6*(
b*c*d^4 - a*d^5)*f*g^4*h - 2*(b*c^2*d^3 - a*c*d^4)*f*g^3*h^2 - 15*(b*c^3*d^
2 - a*c^2*d^3)*f*g^2*h^3 + 12*(b*c^4*d - a*c^3*d^2)*f*g*h^4 - (b*c^5 - a*c^
4*d)*f*h^5)*x)*log(F))*F^((b*f*x + a*f + (d*x + c)*e)/(d*x + c)))/(d^6*g^9
- 6*c*d^5*g^8*h + 15*c^2*d^4*g^7*h^2 - 20*c^3*d^3*g^6*h^3 + 15*c^4*d^2*g^5*
h^4 - 6*c^5*d*g^4*h^5 + c^6*g^3*h^6 + (d^6*g^6*h^3 - 6*c*d^5*g^5*h^4 + 15*c
^2*d^4*g^4*h^5 - 20*c^3*d^3*g^3*h^6 + 15*c^4*d^2*g^2*h^7 - 6*c^5*d*g*h^8 +
c^6*h^9)*x^3 + 3*(d^6*g^7*h^2 - 6*c*d^5*g^6*h^3 + 15*c^2*d^4*g^5*h^4 - 20*c
^3*d^3*g^4*h^5 + 15*c^4*d^2*g^3*h^6 - 6*c^5*d*g^2*h^7 + c^6*g*h^8)*x^2 + 3*
(d^6*g^8*h - 6*c*d^5*g^7*h^2 + 15*c^2*d^4*g^6*h^3 - 20*c^3*d^3*g^5*h^4 + 15
*c^4*d^2*g^4*h^5 - 6*c^5*d*g^3*h^6 + c^6*g^2*h^7)*x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(e+f*(b*x+a)/(d*x+c))/(h*x+g)**4,x)
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g)^4,x, algorithm="giac")
[Out] integrate(F^((b*x + a)*f/(d*x + c) + e)/(h*x + g)^4, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{F^{e+\frac{f\,(a+b\,x)}{c+d\,x}}}{{(g+h\,x)}^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^4,x)
[Out] int(F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^4, x)
```

3.426 $\int f^{a+bx+cx^2} x^3 \, dx$

Optimal. Leaf size=217

$$-\frac{f^{a+bx+cx^2}}{2c^2\log^2(f)}+\frac{3bf^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{8c^{5/2}\log^{\frac{3}{2}}(f)}+\frac{b^2f^{a+bx+cx^2}}{8c^3\log(f)}-\frac{bf^{a+bx+cx^2}x}{4c^2\log(f)}+\frac{f^{a+bx+cx^2}x^2}{2c\log(f)}-\frac{b^3f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{e}}{16c}$$

```
[Out] -1/2*f^(c*x^2+b*x+a)/c^2/ln(f)^2+1/8*b^2*f^(c*x^2+b*x+a)/c^3/ln(f)-1/4*b*f^
(c*x^2+b*x+a)*x/c^2/ln(f)+1/2*f^(c*x^2+b*x+a)*x^2/c/ln(f)+3/8*b*f^(a-1/4*b^
2/c)*erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c^(1/2))*Pi^(1/2)/c^(5/2)/ln(f)^(3/2)-1
/16*b^3*f^(a-1/4*b^2/c)*erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c^(1/2))*Pi^(1/2)/c^
(7/2)/ln(f)^(1/2)
```

Rubi [A]
time = 0.16, antiderivative size = 217, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.250$, Rules used = {2273, 2272, 2266, 2235}

$$\frac{3\sqrt{\pi}\,bf^{a-\frac{b^2}{4c}}\mathrm{Erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{8c^{5/2}\log^{\frac{3}{2}}(f)}+\frac{b^2f^{a+bx+cx^2}}{8c^3\log(f)}-\frac{\sqrt{\pi}\,b^3f^{a-\frac{b^2}{4c}}\mathrm{Erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{16c^{7/2}\sqrt{\log(f)}}-\frac{f^{a+bx+cx^2}}{2c^2\log^2(f)}-\frac{bxf^{a+bx+cx^2}}{4c^2\log(f)}+\frac{x^2f^{a+bx+cx^2}}{2c\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)*x^3,x]
```

```
[Out] -1/2*f^(a + b*x + c*x^2)/(c^2*Log[f]^2) + (3*b*f^(a - b^2/(4*c))*Sqrt[Pi]*E
rfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/(8*c^(5/2)*Log[f]^(3/2)) + (b^
2*f^(a + b*x + c*x^2))/(8*c^3*Log[f]) - (b*f^(a + b*x + c*x^2)*x)/(4*c^2*Lo
g[f]) + (f^(a + b*x + c*x^2)*x^2)/(2*c*Log[f]) - (b^3*f^(a - b^2/(4*c))*Sqr
t[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/(16*c^(7/2)*Sqrt[Log[f]
])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2272

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[e*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] - Dist[(b*e - 2*c*d)/(2*
```

```
c), Int[F^(a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[
b*e - 2*c*d, 0]
```

Rule 2273

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[e*(d + e*x)^(m - 1)*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] +
 (-Dist[(b*e - 2*c*d)/(2*c), Int[(d + e*x)^(m - 1)*F^(a + b*x + c*x^2), x],
 x] - Dist[(m - 1)*(e^2/(2*c*Log[F])), Int[(d + e*x)^(m - 2)*F^(a + b*x + c
*x^2), x], x]) /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[b*e - 2*c*d, 0] && Gt
Q[m, 1]
```

Rubi steps

$$\begin{aligned}\int f^{a+bx+cx^2}x^3\,dx &= \frac{f^{a+bx+cx^2}x^2}{2c\log(f)} - \frac{b\int f^{a+bx+cx^2}x^2\,dx}{2c} - \frac{\int f^{a+bx+cx^2}x\,dx}{c\log(f)}\\ &= -\frac{f^{a+bx+cx^2}}{2c^2\log^2(f)} - \frac{bf^{a+bx+cx^2}x}{4c^2\log(f)} + \frac{f^{a+bx+cx^2}x^2}{2c\log(f)} + \frac{b^2\int f^{a+bx+cx^2}x\,dx}{4c^2} + \frac{b\int f^{a+bx+cx^2}\,dx}{4c^2\log(f)} + b\ldots\\ &= -\frac{f^{a+bx+cx^2}}{2c^2\log^2(f)} + \frac{b^2f^{a+bx+cx^2}}{8c^3\log(f)} - \frac{bf^{a+bx+cx^2}x}{4c^2\log(f)} + \frac{f^{a+bx+cx^2}x^2}{2c\log(f)} - \frac{b^3\int f^{a+bx+cx^2}\,dx}{8c^3} + \frac{\left(bf^{a-\frac{b^2}{4c}}\ldots\right.}{4\ldots}\\ &= -\frac{f^{a+bx+cx^2}}{2c^2\log^2(f)} + \frac{3bf^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{8c^{5/2}\log^{\frac{3}{2}}(f)} + \frac{b^2f^{a+bx+cx^2}}{8c^3\log(f)} - \frac{bf^{a+bx+cx^2}x}{4c^2\log(f)} + \frac{f^{a+}\ldots}{2c\ldots}\\ &= -\frac{f^{a+bx+cx^2}}{2c^2\log^2(f)} + \frac{3bf^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{8c^{5/2}\log^{\frac{3}{2}}(f)} + \frac{b^2f^{a+bx+cx^2}}{8c^3\log(f)} - \frac{bf^{a+bx+cx^2}x}{4c^2\log(f)} + \frac{f^{a+}\ldots}{2c\ldots}\end{aligned}$$

Mathematica [A]
time = 0.24, size = 122, normalized size = 0.56

$$\frac{f^{a-\frac{b^2}{4c}}\left(b\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)\sqrt{\log(f)}\,(6c-b^2\log(f)) + 2\sqrt{c}\,f^{\frac{(b+2cx)^2}{4c}}(-4c+(b^2-2bcx+4c^2x^2)\log(f))\right)}{16c^{7/2}\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)*x^3,x]
```

```
[Out] (f^(a - b^2/(4*c))*(b*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])]
*Sqrt[Log[f]]*(6*c - b^2*Log[f]) + 2*Sqrt[c]*f^((b + 2*c*x)^2/(4*c))*(-4*c
+ (b^2 - 2*b*c*x + 4*c^2*x^2)*Log[f])))/(16*c^(7/2)*Log[f]^2)
```

Maple [A]
time = 0.05, size = 218, normalized size = 1.00

method	result
risch	$\frac{x^{2} f^{c\,x^{2}} f^{bx} f^{a}}{2c\ln\left(f\right)}-\frac{bx\,f^{c\,x^{2}} f^{bx} f^{a}}{4c^{2}\ln\left(f\right)}+\frac{b^{2} f^{c\,x^{2}} f^{bx} f^{a}}{8c^{3}\ln\left(f\right)}+\frac{b^{3}\sqrt{\pi}\, f^{a} f^{-\frac{b^{2}}{4c}}\operatorname{erf}\left(-\sqrt{-c\ln\left(f\right)}\, x+\frac{b\ln\left(f\right)}{2\sqrt{-c\ln\left(f\right)}}\right)}{16c^{3}\sqrt{-c\ln\left(f\right)}}-\frac{3b\sqrt{\pi}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)*x^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/c/ln(f)*x^2*f^(c*x^2)*f^(b*x)*f^a-1/4*b/c^2/ln(f)*x*f^(c*x^2)*f^(b*x)*f
^a+1/8*b^2/c^3/ln(f)*f^(c*x^2)*f^(b*x)*f^a+1/16*b^3/c^3*Pi^(1/2)*f^a*f^(-1/
4*b^2/c)/(-c*ln(f))^(1/2)*erf(-(-c*ln(f))^(1/2)*x+1/2*b*ln(f)/(-c*ln(f))^(1
/2))-3/8*b/c^2/ln(f)*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(-(-c*
ln(f))^(1/2)*x+1/2*b*ln(f)/(-c*ln(f))^(1/2))-1/2/c^2/ln(f)^2*f^(c*x^2)*f^(b
*x)*f^a
```

Maxima [A]
time = 0.37, size = 201, normalized size = 0.93

$$-\frac{\left(\frac{\sqrt{\pi}\,(2\,cx+b)b^{3}\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2\,cx+b)^{2}\log\left(f\right)}{c}}\right)-1\right)\log\left(f\right)^{4}}{\sqrt{-\frac{(2\,cx+b)^{2}\log\left(f\right)}{c}}\,(c\log\left(f\right))^{\frac{7}{2}}}-\frac{12\,(2\,cx+b)^{3}b\Gamma\left(\frac{3}{2},-\frac{(2\,cx+b)^{2}\log(f)}{4\,c}\right)\log(f)^{4}}{\left(-\frac{(2\,cx+b)^{2}\log(f)}{c}\right)^{\frac{3}{2}}(c\log(f))^{\frac{7}{2}}}-\frac{6\,b^{2}cf^{\frac{(2\,cx+b)^{2}}{4\,c}}\log(f)^{3}}{(c\log(f))^{\frac{7}{2}}}+\frac{8\,c^{2}\Gamma\left(2,-\frac{(2\,cx+b)^{2}\log(f)}{4\,c}\right)\log(f)^{2}}{(c\log(f))^{\frac{7}{2}}}\right)f^{a-\frac{b^{2}}{4\,c}}}{16\,\sqrt{c\log\left(f\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*x^3,x, algorithm="maxima")
```

```
[Out] -1/16*(sqrt(pi)*(2*c*x + b)*b^3*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) - 1
)*log(f)^4/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(7/2)) - 12*(2*c*x + b
)^3*b*gamma(3/2, -1/4*(2*c*x + b)^2*log(f)/c)*log(f)^4/((-(2*c*x + b)^2*log
(f)/c)^(3/2)*(c*log(f))^(7/2)) - 6*b^2*c*f^(1/4*(2*c*x + b)^2/c)*log(f)^3/(
c*log(f))^(7/2) + 8*c^2*gamma(2, -1/4*(2*c*x + b)^2*log(f)/c)*log(f)^2/(c*l
og(f))^(7/2))*f^(a - 1/4*b^2/c)/sqrt(c*log(f))
```

Fricas [A]
time = 0.40, size = 114, normalized size = 0.53

$$-\frac{2\left(4\,c^{2}-\left(4\,c^{3}x^{2}-2\,bc^{2}x+b^{2}c\right)\log\left(f\right)\right)f^{cx^{2}+bx+a}-\frac{\sqrt{\pi}\,(b^{3}\log(f)-6\,bc)\sqrt{-c\log\left(f\right)}\operatorname{erf}\left(\frac{(2\,cx+b)\sqrt{-c\log\left(f\right)}}{2\,c}\right)}{f^{\frac{b^{2}-4\,ac}{4\,c}}}}{16\,c^{4}\log\left(f\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*x^3,x, algorithm="fricas")
```

```
[Out] -1/16*(2*(4*c^2 - (4*c^3*x^2 - 2*b*c^2*x + b^2*c)*log(f))*f^(c*x^2 + b*x +
a) - sqrt(pi)*(b^3*log(f) - 6*b*c)*sqrt(-c*log(f))*erf(1/2*(2*c*x + b)*sqrt
(-c*log(f))/c)/f^(1/4*(b^2 - 4*a*c)/c))/(c^4*log(f)^2)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx+cx^2}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)*x**3,x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)*x**3, x)
```

Giac [A]
time = 2.63, size = 137, normalized size = 0.63

$$\frac{\frac{\sqrt{\pi}\,(b^3\log(f)-6\,bc)\,\mathrm{erf}\left(-\frac{1}{2}\,\sqrt{-c\log\left(f\right)}\,\left(2\,x+\frac{b}{c}\right)\right)e^{\left(-\frac{b^2\log(f)-4\,ac\log(f)}{4\,c}\right)}}{\sqrt{-c\log\left(f\right)}\,\log(f)}+\frac{2\,\left(c^2\left(2\,x+\frac{b}{c}\right)^2\log(f)-3\,bc\left(2\,x+\frac{b}{c}\right)\log(f)+3\,b^2\log(f)-4\,c\right)e^{\left(cx^2\log(f)+bx\log(f)+a\log(f)\right)}}{\log(f)^2}}{16\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*x^3,x, algorithm="giac")
```

```
[Out] 1/16*(sqrt(pi)*(b^3*log(f) - 6*b*c)*erf(-1/2*sqrt(-c*log(f))*(2*x + b/c))*e
^(-1/4*(b^2*log(f) - 4*a*c*log(f))/c)/(sqrt(-c*log(f))*log(f)) + 2*(c^2*(2*
x + b/c)^2*log(f) - 3*b*c*(2*x + b/c)*log(f) + 3*b^2*log(f) - 4*c)*e^(c*x^2
*log(f) + b*x*log(f) + a*log(f))/log(f)^2)/c^3
```

Mupad [B]
time = 3.87, size = 153, normalized size = 0.71

$$\frac{f^a\,f^{c\,x^2}\,f^{b\,x}\,x^2}{2\,c\,\ln\left(f\right)}-f^a\,f^{c\,x^2}\,f^{b\,x}\,\left(\frac{1}{2\,c^2\ln\left(f\right)^2}-\frac{b^2}{8\,c^3\,\ln\left(f\right)}\right)+\frac{f^{a-\frac{b^2}{4\,c}}\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\frac{b\,\ln(f)}{2}+c\,x\,\ln(f)}{\sqrt{c\,\ln\left(f\right)}}\right)\,\left(\frac{3\,b\,c}{8}-\frac{b^3\,\ln(f)}{16}\right)}{c^3\,\ln\left(f\right)\,\sqrt{c\,\ln\left(f\right)}}-\frac{b\,f^a\,f^{c\,x^2}\,f^{b\,x}\,x}{4\,c^2\,\ln\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)*x^3,x)
```

```
[Out] (f^a*f^(c*x^2)*f^(b*x)*x^2)/(2*c*log(f)) - f^a*f^(c*x^2)*f^(b*x)*(1/(2*c^2*
log(f)^2) - b^2/(8*c^3*log(f))) + (f^(a - b^2/(4*c))*pi^(1/2)*erfi(((b*log(
f))/2 + c*x*log(f))/(c*log(f))^(1/2))*((3*b*c)/8 - (b^3*log(f))/16))/(c^3*l
og(f)*(c*log(f))^(1/2)) - (b*f^a*f^(c*x^2)*f^(b*x)*x)/(4*c^2*log(f))
```

3.427 $\int f^{a+bx+cx^2} x^2 \, dx$

Optimal. Leaf size=164

$$-\frac{f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\text{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{4c^{3/2}\log^{\frac{3}{2}}(f)}-\frac{bf^{a+bx+cx^2}}{4c^2\log(f)}+\frac{f^{a+bx+cx^2}x}{2c\log(f)}+\frac{b^2f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\text{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{8c^{5/2}\sqrt{\log(f)}}$$

```
[Out] -1/4*b*f^(c*x^2+b*x+a)/c^2/ln(f)+1/2*f^(c*x^2+b*x+a)*x/c/ln(f)-1/4*f^(a-1/4
*b^2/c)*erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c^(1/2))*Pi^(1/2)/c^(3/2)/ln(f)^(3/2
)+1/8*b^2*f^(a-1/4*b^2/c)*erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c^(1/2))*Pi^(1/2)/
c^(5/2)/ln(f)^(1/2)
```

Rubi [A]

time = 0.08, antiderivative size = 164, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.250$, Rules used = {2273, 2272, 2266, 2235}

$$-\frac{\sqrt{\pi}\,f^{a-\frac{b^2}{4c}}\text{Erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{4c^{3/2}\log^{\frac{3}{2}}(f)}+\frac{\sqrt{\pi}\,b^2f^{a-\frac{b^2}{4c}}\text{Erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{8c^{5/2}\sqrt{\log(f)}}-\frac{bf^{a+bx+cx^2}}{4c^2\log(f)}+\frac{xf^{a+bx+cx^2}}{2c\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)*x^2,x]
```

```
[Out] -1/4*(f^(a - b^2/(4*c))*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c]
)])/(c^(3/2)*Log[f]^(3/2)) - (b*f^(a + b*x + c*x^2))/(4*c^2*Log[f]) + (f^(a
 + b*x + c*x^2)*x)/(2*c*Log[f]) + (b^2*f^(a - b^2/(4*c))*Sqrt[Pi]*Erfi[((b
+ 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/(8*c^(5/2)*Sqrt[Log[f]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2272

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[e*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] - Dist[(b*e - 2*c*d)/(2*
c), Int[F^(a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[
```

```
b*e - 2*c*d, 0]
```

Rule 2273

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[e*(d + e*x)^(m - 1)*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] +
 (-Dist[(b*e - 2*c*d)/(2*c), Int[(d + e*x)^(m - 1)*F^(a + b*x + c*x^2), x],
 x] - Dist[(m - 1)*(e^2/(2*c*Log[F])), Int[(d + e*x)^(m - 2)*F^(a + b*x + c
*x^2), x], x]) /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[b*e - 2*c*d, 0] && Gt
Q[m, 1]
```

Rubi steps

$$\begin{aligned}\int f^{a+bx+cx^2}x^2\,dx &= \frac{f^{a+bx+cx^2}x}{2c\log(f)}-\frac{b\int f^{a+bx+cx^2}x\,dx}{2c}-\frac{\int f^{a+bx+cx^2}\,dx}{2c\log(f)}\\ &= -\frac{bf^{a+bx+cx^2}}{4c^2\log(f)}+\frac{f^{a+bx+cx^2}x}{2c\log(f)}+\frac{b^2\int f^{a+bx+cx^2}\,dx}{4c^2}-\frac{f^{a-\frac{b^2}{4c}}\int f^{\frac{(b+2cx)^2}{4c}}\,dx}{2c\log(f)}\\ &= -\frac{f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\text{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{4c^{3/2}\log^{\frac{3}{2}}(f)}-\frac{bf^{a+bx+cx^2}}{4c^2\log(f)}+\frac{f^{a+bx+cx^2}x}{2c\log(f)}+\frac{\left(b^2f^{a-\frac{b^2}{4c}}\right)\int f^{\frac{(b+2cx)^2}{4c}}\,d}{4c^2}\\ &= -\frac{f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\text{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{4c^{3/2}\log^{\frac{3}{2}}(f)}-\frac{bf^{a+bx+cx^2}}{4c^2\log(f)}+\frac{f^{a+bx+cx^2}x}{2c\log(f)}+\frac{b^2f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\text{erfi}\left(\frac{(b+2c}{}\right.}{8c^{5/2}\sqrt{\log(}}\end{aligned}$$

Mathematica [A]
time = 0.19, size = 104, normalized size = 0.63

$$\frac{f^{a-\frac{b^2}{4c}}\left(-2\sqrt{c}\,f^{\frac{(b+2cx)^2}{4c}}(b-2cx)\sqrt{\log(f)}+\sqrt{\pi}\,\text{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)\left(-2c+b^2\log(f)\right)\right)}{8c^{5/2}\log^{\frac{3}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)*x^2,x]
```

```
[Out] (f^(a - b^2/(4*c))*(-2*Sqrt[c]*f^((b + 2*c*x)^2/(4*c))*(b - 2*c*x)*Sqrt[Log
[f]] + Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])]*(-2*c + b^2*Lo
g[f]))/(8*c^(5/2)*Log[f]^(3/2))
```

Maple [A]
time = 0.02, size = 163, normalized size = 0.99

method	result
risch	$\frac{x f^{c x^2} f^{bx} f^a}{2c\ln(f)} - \frac{b f^{c x^2} f^{bx} f^a}{4c^2\ln(f)} - \frac{b^2\sqrt{\pi}\, f^a f^{-\frac{b^2}{4c}} \operatorname{erf}\left(-\sqrt{-c\ln(f)}\, x + \frac{b\ln(f)}{2\sqrt{-c\ln(f)}}\right)}{8c^2\sqrt{-c\ln(f)}} + \frac{\sqrt{\pi}\, f^a f^{-\frac{b^2}{4c}} \operatorname{erf}\left(-\sqrt{-\right.}{4c\ln(f)}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)*x^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/c/ln(f)*x*f^(c*x^2)*f^(b*x)*f^a-1/4*b/c^2/ln(f)*f^(c*x^2)*f^(b*x)*f^a-1
/8*b^2/c^2*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(-(-c*ln(f))^(1/
2)*x+1/2*b*ln(f)/(-c*ln(f))^(1/2))+1/4/c/ln(f)*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/
(-c*ln(f))^(1/2)*erf(-(-c*ln(f))^(1/2)*x+1/2*b*ln(f)/(-c*ln(f))^(1/2))
```

Maxima [A]
time = 0.36, size = 166, normalized size = 1.01

$$\frac{\left(\frac{\sqrt{\pi}\,(2\,cx+b)b^2\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2\,cx+b)^2\log(f)}{c}}\right)-1\right)\log(f)^3}{\sqrt{-\frac{(2\,cx+b)^2\log(f)}{c}}\,(c\log(f))^{\frac{5}{2}}} - \frac{4\,(2\,cx+b)^3\Gamma\left(\frac{3}{2}, -\frac{(2\,cx+b)^2\log(f)}{4\,c}\right)\log(f)^3}{\left(-\frac{(2\,cx+b)^2\log(f)}{c}\right)^{\frac{3}{2}}(c\log(f))^{\frac{5}{2}}} - \frac{4\,bcf^{\frac{(2\,cx+b)^2}{4\,c}}\log(f)^2}{(c\log(f))^{\frac{5}{2}}}\right)f^{a-\frac{b^2}{4\,c}}}{8\,\sqrt{c\log(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*x^2,x, algorithm="maxima")
```

```
[Out] 1/8*(sqrt(pi)*(2*c*x + b)*b^2*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) - 1)*
log(f)^3/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(5/2)) - 4*(2*c*x + b)^3
*gamma(3/2, -1/4*(2*c*x + b)^2*log(f)/c)*log(f)^3/((-(2*c*x + b)^2*log(f)/c
)^(3/2)*(c*log(f))^(5/2)) - 4*b*c*f^(1/4*(2*c*x + b)^2/c)*log(f)^2/(c*log(f
))^(5/2))*f^(a - 1/4*b^2/c)/sqrt(c*log(f))
```

Fricas [A]
time = 0.38, size = 95, normalized size = 0.58

$$\frac{2\,(2\,c^2x - bc)f^{cx^2+bx+a}\log(f) - \frac{\sqrt{\pi}\,(b^2\log(f)-2\,c)\sqrt{-c\log(f)}\operatorname{erf}\left(\frac{(2\,cx+b)\sqrt{-c\log(f)}}{2\,c}\right)}{f^{\frac{b^2-4\,ac}{4\,c}}}}{8\,c^3\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*x^2,x, algorithm="fricas")
```

```
[Out] 1/8*(2*(2*c^2*x - b*c)*f^(c*x^2 + b*x + a)*log(f) - sqrt(pi)*(b^2*log(f) -
2*c)*sqrt(-c*log(f))*erf(1/2*(2*c*x + b)*sqrt(-c*log(f))/c)/f^(1/4*(b^2 - 4
*a*c)/c))/(c^3*log(f)^2)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx+cx^2}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)*x**2,x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)*x**2, x)
```

Giac [A]
time = 2.60, size = 108, normalized size = 0.66

$$-\frac{\frac{\sqrt{\pi}\,(b^2\log(f)-2c)\operatorname{erf}\left(-\frac{1}{2}\sqrt{-c\log(f)}\left(2x+\frac{b}{c}\right)\right)e^{\left(-\frac{b^2\log(f)-4ac\log(f)}{4c}\right)}}{\sqrt{-c\log(f)}\log(f)}-\frac{2\left(c\left(2x+\frac{b}{c}\right)-2b\right)e^{\left(cx^2\log(f)+bx\log(f)+a\log(f)\right)}}{\log(f)}}{8c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*x^2,x, algorithm="giac")
```

```
[Out] -1/8*(sqrt(pi)*(b^2*log(f) - 2*c)*erf(-1/2*sqrt(-c*log(f))*(2*x + b/c))*e^(
-1/4*(b^2*log(f) - 4*a*c*log(f))/c)/(sqrt(-c*log(f))*log(f)) - 2*(c*(2*x +
b/c) - 2*b)*e^(c*x^2*log(f) + b*x*log(f) + a*log(f))/log(f))/c^2
```

Mupad [B]
time = 3.60, size = 111, normalized size = 0.68

$$\frac{f^a\,f^{c\,x^2}\,f^{b\,x}\,x}{2\,c\,\ln(f)}-\frac{b\,f^a\,f^{c\,x^2}\,f^{b\,x}}{4\,c^2\,\ln(f)}-\frac{f^{a-\frac{b^2}{4\,c}}\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{\frac{b\,\ln(f)}{2}+c\,x\,\ln(f)}{\sqrt{c\,\ln(f)}}\right)\,\left(\frac{c}{4}-\frac{b^2\,\ln(f)}{8}\right)}{c^2\,\ln(f)\,\sqrt{c\,\ln(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)*x^2,x)
```

```
[Out] (f^a*f^(c*x^2)*f^(b*x)*x)/(2*c*log(f)) - (b*f^a*f^(c*x^2)*f^(b*x))/(4*c^2*l
og(f)) - (f^(a - b^2/(4*c))*pi^(1/2)*erfi(((b*log(f))/2 + c*x*log(f))/(c*lo
g(f))^(1/2))*(c/4 - (b^2*log(f))/8))/(c^2*log(f)*(c*log(f))^(1/2))
```

3.428 $\int f^{a+bx+cx^2} x \, dx$

Optimal. Leaf size=81

$$\frac{f^{a+bx+cx^2}}{2c\log(f)} - \frac{bf^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{4c^{3/2}\sqrt{\log(f)}}$$

```
[Out] 1/2*f^(c*x^2+b*x+a)/c/ln(f)-1/4*b*f^(a-1/4*b^2/c)*erfi(1/2*(2*c*x+b)*ln(f)^
(1/2)/c^(1/2))*Pi^(1/2)/c^(3/2)/ln(f)^(1/2)
```

Rubi [A]
time = 0.03, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.214$, Rules used = {2272, 2266, 2235}

$$\frac{f^{a+bx+cx^2}}{2c\log(f)} - \frac{\sqrt{\pi}\,bf^{a-\frac{b^2}{4c}}\mathrm{Erfi}\left(\frac{\sqrt{\log(f)}(b+2cx)}{2\sqrt{c}}\right)}{4c^{3/2}\sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)*x,x]
```

```
[Out] f^(a + b*x + c*x^2)/(2*c*Log[f]) - (b*f^(a - b^2/(4*c))*Sqrt[Pi]*Erfi[((b +
 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/(4*c^(3/2)*Sqrt[Log[f]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2272

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[e*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] - Dist[(b*e - 2*c*d)/(2*
c), Int[F^(a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[
b*e - 2*c*d, 0]
```

Rubi steps

$$\int f^{a+bx+cx^2}x\,dx = \frac{f^{a+bx+cx^2}}{2c\log(f)} - \frac{b\int f^{a+bx+cx^2}\,dx}{2c}$$
$$= \frac{f^{a+bx+cx^2}}{2c\log(f)} - \frac{\left(bf^{a-\frac{b^2}{4c}}\right)\int f^{\frac{(b+2cx)^2}{4c}}\,dx}{2c}$$
$$= \frac{f^{a+bx+cx^2}}{2c\log(f)} - \frac{bf^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{4c^{3/2}\sqrt{\log(f)}}$$

Mathematica [A]
time = 0.11, size = 81, normalized size = 1.00

$$\frac{f^{a+bx+cx^2}}{2c\log(f)} - \frac{bf^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{4c^{3/2}\sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)*x,x]
```

```
[Out] f^(a + b*x + c*x^2)/(2*c*Log[f]) - (b*f^(a - b^2/(4*c))*Sqrt[Pi]*Erfi[((b +
 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/(4*c^(3/2)*Sqrt[Log[f]])
```

Maple [A]
time = 0.02, size = 79, normalized size = 0.98

method	result	size
risch	$\frac{f^{c\,x^2} f^{bx} f^{a}}{2c\ln(f)} + \frac{b\sqrt{\pi}\,f^{a} f^{-\frac{b^2}{4c}}\,\mathrm{erf}\left(-\sqrt{-c\ln(f)}\,x + \frac{b\ln(f)}{2\sqrt{-c\ln(f)}}\right)}{4c\sqrt{-c\ln(f)}}$	79

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)*x,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/c/ln(f)*f^(c*x^2)*f^(b*x)*f^a+1/4*b/c*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*l
n(f))^(1/2)*erf(-(-c*ln(f))^(1/2)*x+1/2*b*ln(f)/(-c*ln(f))^(1/2))
```

Maxima [A]

time = 0.37, size = 107, normalized size = 1.32

$$-\frac{\left(\frac{\sqrt{\pi}\,(2\,cx+b)b\left(\operatorname{erf}\left(\frac{1}{2}\,\sqrt{-\frac{(2\,cx+b)^2\log(f)}{c}}\right)-1\right)\log(f)^2}{\sqrt{-\frac{(2\,cx+b)^2\log(f)}{c}}\,(c\log(f))^{\frac{3}{2}}}-\frac{2\,cf^{\frac{(2\,cx+b)^2}{4\,c}}\log(f)}{(c\log(f))^{\frac{3}{2}}}\right)f^{a-\frac{b^2}{4\,c}}}{4\,\sqrt{c\log(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*x,x, algorithm="maxima")
```

```
[Out] -1/4*(sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) - 1)*l
og(f)^2/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(3/2)) - 2*c*f^(1/4*(2*c*
x + b)^2/c)*log(f)/(c*log(f))^(3/2))*f^(a - 1/4*b^2/c)/sqrt(c*log(f))
```

Fricas [A]
time = 0.38, size = 73, normalized size = 0.90

$$\frac{2\,cf^{cx^2+bx+a}+\frac{\sqrt{\pi}\,\sqrt{-c\log(f)}\,b\operatorname{erf}\left(\frac{(2\,cx+b)\sqrt{-c\log(f)}}{2\,c}\right)}{f^{\frac{b^2-4\,ac}{4\,c}}}}{4\,c^2\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*x,x, algorithm="fricas")
```

```
[Out] 1/4*(2*c*f^(c*x^2 + b*x + a) + sqrt(pi)*sqrt(-c*log(f))*b*erf(1/2*(2*c*x +
b)*sqrt(-c*log(f))/c)/f^(1/4*(b^2 - 4*a*c)/c))/(c^2*log(f))
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx+cx^2}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)*x,x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)*x, x)
```

Giac [A]
time = 2.97, size = 80, normalized size = 0.99

$$\frac{\frac{\sqrt{\pi}\,b\operatorname{erf}\left(-\frac{1}{2}\,\sqrt{-c\log(f)}\left(2\,x+\frac{b}{c}\right)\right)e^{\left(-\frac{b^2\log(f)-4\,ac\log(f)}{4\,c}\right)}}{\sqrt{-c\log(f)}}+\frac{2\,e^{\left(cx^2\log(f)+bx\log(f)+a\log(f)\right)}}{\log(f)}}{4\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*x,x, algorithm="giac")
```

```
[Out] 1/4*(sqrt(pi)*b*erf(-1/2*sqrt(-c*log(f))*(2*x + b/c))*e^(-1/4*(b^2*log(f) -
 4*a*c*log(f))/c)/sqrt(-c*log(f)) + 2*e^(c*x^2*log(f) + b*x*log(f) + a*log(
f))/log(f))/c
```

Mupad [B]
time = 3.57, size = 71, normalized size = 0.88

$$\frac{f^a\,f^{c\,x^2}\,f^{b\,x}}{2\,c\,\ln\left(f\right)}-\frac{b\,f^{a-\frac{b^2}{4\,c}}\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\frac{b\,\ln(f)}{2}+c\,x\,\ln(f)}{\sqrt{c\,\ln\left(f\right)}}\right)}{4\,c\,\sqrt{c\,\ln\left(f\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)*x,x)
```

```
[Out] (f^a*f^(c*x^2)*f^(b*x))/(2*c*log(f)) - (b*f^(a - b^2/(4*c))*pi^(1/2)*erfi((
(b*log(f))/2 + c*x*log(f))/(c*log(f))^(1/2)))/(4*c*(c*log(f))^(1/2))
```

3.429 $\int f^{a+bx+cx^2}\,dx$

Optimal. Leaf size=56

$$\frac{f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{2\sqrt{c}\,\sqrt{\log(f)}}$$

```
[Out] 1/2*f^(a-1/4*b^2/c)*erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c^(1/2))*Pi^(1/2)/c^(1/2
)/ln(f)^(1/2)
```

Rubi [A]
time = 0.01, antiderivative size = 56, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {2266, 2235}

$$\frac{\sqrt{\pi}\,f^{a-\frac{b^2}{4c}}\,\mathrm{Erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{2\sqrt{c}\,\sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2),x]
```

```
[Out] (f^(a - b^2/(4*c))*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/(
2*Sqrt[c]*Sqrt[Log[f]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rubi steps

$$\begin{aligned}\int f^{a+bx+cx^2}\,dx &= f^{a-\frac{b^2}{4c}}\int f^{\frac{(b+2cx)^2}{4c}}\,dx\\ &= \frac{f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{2\sqrt{c}\,\sqrt{\log(f)}}\end{aligned}$$

Mathematica [A]
time = 0.03, size = 56, normalized size = 1.00

$$\frac{f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{2\sqrt{c}\,\sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2),x]
```

```
[Out] (f^(a - b^2/(4*c))*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/(
2*Sqrt[c]*Sqrt[Log[f]])
```

Maple [A]
time = 0.02, size = 50, normalized size = 0.89

method	result	size
risch	$-\frac{\sqrt{\pi}\,f^{a} f^{-\frac{b^2}{4c}}\,\mathrm{erf}\left(-\sqrt{-c\ln(f)}\,x+\frac{b\ln(f)}{2\sqrt{-c\ln(f)}}\right)}{2\sqrt{-c\ln(f)}}$	50

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(-(-c*ln(f))^(1/2)*x+1
/2*b*ln(f)/(-c*ln(f))^(1/2))
```

Maxima [A]
time = 0.30, size = 50, normalized size = 0.89

$$\frac{\sqrt{\pi}\,f^{a}\,\mathrm{erf}\left(\sqrt{-c\log(f)}\,x-\frac{b\log(f)}{2\sqrt{-c\log(f)}}\right)}{2\sqrt{-c\log(f)}\,f^{\frac{b^2}{4c}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(pi)*f^a*erf(sqrt(-c*log(f))*x - 1/2*b*log(f)/sqrt(-c*log(f)))/(sqr
t(-c*log(f))*f^(1/4*b^2/c))
```

Fricas [A]
time = 0.38, size = 55, normalized size = 0.98

$$-\frac{\sqrt{\pi}\,\sqrt{-c\log(f)}\,\mathrm{erf}\left(\frac{(2\,cx+b)\sqrt{-c\log(f)}}{2\,c}\right)}{2\,cf^{\frac{b^2-4\,ac}{4\,c}}\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-c*log(f))*erf(1/2*(2*c*x + b)*sqrt(-c*log(f))/c)/(c*f^(
1/4*(b^2 - 4*a*c)/c)*log(f))
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx+cx^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a),x)
```

```
[Out] Integral(f**(a + b*x + c*x**2), x)
```

Giac [A]
time = 2.62, size = 50, normalized size = 0.89

$$-\frac{\sqrt{\pi}\,\mathrm{erf}\left(-\frac{1}{2}\,\sqrt{-c\log\left(f\right)}\,\left(2\,x+\frac{b}{c}\right)\right)e^{\left(-\frac{b^2\log\left(f\right)-4\,ac\log\left(f\right)}{4\,c}\right)}}{2\,\sqrt{-c\log\left(f\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*erf(-1/2*sqrt(-c*log(f))*(2*x + b/c))*e^(-1/4*(b^2*log(f) - 4
*a*c*log(f))/c)/sqrt(-c*log(f))
```

Mupad [B]
time = 3.53, size = 49, normalized size = 0.88

$$-\frac{f^a\,\sqrt{\pi}\,\mathrm{e}^{-\frac{b^2\,\ln\left(f\right)}{4\,c}}\,\mathrm{erf}\left(\frac{b\,\ln\left(f\right)\,1{}\mathrm{i}+c\,x\,\ln\left(f\right)\,2{}\mathrm{i}}{2\,\sqrt{c\,\ln\left(f\right)}}\right)\,1{}\mathrm{i}}{2\,\sqrt{c\,\ln\left(f\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2),x)
```

```
[Out] -(f^a*pi^(1/2)*exp(-(b^2*log(f))/(4*c))*erf((b*log(f)*1i + c*x*log(f)*2i)/(
2*(c*log(f))^(1/2)))*1i)/(2*(c*log(f))^(1/2))
```

3.430 $\int \frac{f^{a+bx+cx^2}}{x}\,dx$

Optimal. Leaf size=19

$$\operatorname{Int}\left(\frac{f^{a+bx+cx^2}}{x},x\right)$$

```
[Out] Unintegrable(f^(c*x^2+b*x+a)/x,x)
```

Rubi [A]
time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{f^{a+bx+cx^2}}{x}\,dx$$

Verification is not applicable to the result.

```
[In] Int[f^(a + b*x + c*x^2)/x,x]
```

```
[Out] Defer[Int][f^(a + b*x + c*x^2)/x, x]
```

Rubi steps

$$\int \frac{f^{a+bx+cx^2}}{x}\,dx = \int \frac{f^{a+bx+cx^2}}{x}\,dx$$

Mathematica [A]
time = 0.17, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx+cx^2}}{x}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[f^(a + b*x + c*x^2)/x,x]
```

```
[Out] Integrate[f^(a + b*x + c*x^2)/x, x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{f^{c\,x^{2}+b x +a}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)/x,x)
```

```
[Out] int(f^(c*x^2+b*x+a)/x,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/x,x, algorithm="maxima")
```

```
[Out] integrate(f^(c*x^2 + b*x + a)/x, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/x,x, algorithm="fricas")
```

```
[Out] integral(f^(c*x^2 + b*x + a)/x, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx+cx^2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)/x,x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)/x, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/x,x, algorithm="giac")
```

```
[Out] integrate(f^(c*x^2 + b*x + a)/x, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{f^{c x^2+b x+a}}{x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)/x,x)
```

```
[Out] int(f^(a + b*x + c*x^2)/x, x)
```

3.431 $\int \frac{f^{a+bx+cx^2}}{x^2} dx$

Optimal. Leaf size=94

$$-\frac{f^{a+bx+cx^2}}{x}+\sqrt{c}\, f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\text{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)\sqrt{\log(f)}+b\log(f)\text{Int}\left(\frac{f^{a+bx+cx^2}}{x},x\right)$$

```
[Out] -f^(c*x^2+b*x+a)/x+f^(a-1/4*b^2/c)*erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c^(1/2))*
c^(1/2)*Pi^(1/2)*ln(f)^(1/2)+b*ln(f)*Unintegrable(f^(c*x^2+b*x+a)/x,x)
```

Rubi [A]
time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{f^{a+bx+cx^2}}{x^2} dx$$

Verification is not applicable to the result.

```
[In] Int[f^(a + b*x + c*x^2)/x^2,x]
```

```
[Out] -(f^(a + b*x + c*x^2)/x) + Sqrt[c]*f^(a - b^2/(4*c))*Sqrt[Pi]*Erfi[((b + 2*
c*x)*Sqrt[Log[f]])/(2*Sqrt[c])]*Sqrt[Log[f]] + b*Log[f]*Defer[Int][f^(a + b
*x + c*x^2)/x, x]
```

Rubi steps

$$\begin{aligned}\int \frac{f^{a+bx+cx^2}}{x^2} dx &= -\frac{f^{a+bx+cx^2}}{x}+(b\log(f))\int \frac{f^{a+bx+cx^2}}{x} dx+(2c\log(f))\int f^{a+bx+cx^2} dx\\ &= -\frac{f^{a+bx+cx^2}}{x}+(b\log(f))\int \frac{f^{a+bx+cx^2}}{x} dx+\left(2cf^{a-\frac{b^2}{4c}}\log(f)\right)\int f^{\frac{(b+2cx)^2}{4c}} dx\\ &= -\frac{f^{a+bx+cx^2}}{x}+\sqrt{c}\, f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\text{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)\sqrt{\log(f)}+(b\log(f))\int \frac{f^{a+bx+c}}{x}\end{aligned}$$

Mathematica [A]
time = 0.36, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx+cx^2}}{x^2} dx$$

Verification is not applicable to the result.

```
[In] Integrate[f^(a + b*x + c*x^2)/x^2,x]
```

```
[Out] Integrate[f^(a + b*x + c*x^2)/x^2, x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{f^{c\,x^{2}+b x +a}}{x^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)/x^2,x)
```

```
[Out] int(f^(c*x^2+b*x+a)/x^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/x^2,x, algorithm="maxima")
```

```
[Out] integrate(f^(c*x^2 + b*x + a)/x^2, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/x^2,x, algorithm="fricas")
```

```
[Out] integral(f^(c*x^2 + b*x + a)/x^2, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a + b x + c x^{2}}}{x^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)/x**2,x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)/x**2, x)
```

Giac [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/x^2,x, algorithm="giac")
[Out] integrate(f^(c*x^2 + b*x + a)/x^2, x)
```

Mupad [**A**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{f^{c\,x^2+b\,x+a}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)/x^2,x)
[Out] int(f^(a + b*x + c*x^2)/x^2, x)
```

3.432 $\int e^{a+bx-cx^2} x^3 \, dx$

Optimal. Leaf size=181

$$-\frac{b^2 e^{a+bx-cx^2}}{8c^3}-\frac{e^{a+bx-cx^2}}{2c^2}-\frac{be^{a+bx-cx^2}x}{4c^2}-\frac{e^{a+bx-cx^2}x^2}{2c}-\frac{b^3 e^{a+\frac{b^2}{4c}}\sqrt{\pi}\operatorname{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{16c^{7/2}}-\frac{3be^{a+\frac{b^2}{4c}}\sqrt{\pi}\operatorname{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{8c^{5/2}}$$

```
[Out] -1/8*b^2*exp(-c*x^2+b*x+a)/c^3-1/2*exp(-c*x^2+b*x+a)/c^2-1/4*b*exp(-c*x^2+b
*x+a)*x/c^2-1/2*exp(-c*x^2+b*x+a)*x^2/c-1/16*b^3*exp(a+1/4*b^2/c)*erf(1/2*(
-2*c*x+b)/c^(1/2))*Pi^(1/2)/c^(7/2)-3/8*b*exp(a+1/4*b^2/c)*erf(1/2*(-2*c*x+
b)/c^(1/2))*Pi^(1/2)/c^(5/2)
```

Rubi [A]
time = 0.12, antiderivative size = 181, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.235$, Rules used = {2273, 2272, 2266, 2236}

$$-\frac{3\sqrt{\pi}\,be^{a+\frac{b^2}{4c}}\operatorname{Erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{8c^{5/2}}-\frac{b^2 e^{a+bx-cx^2}}{8c^3}-\frac{\sqrt{\pi}\,b^3 e^{a+\frac{b^2}{4c}}\operatorname{Erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{16c^{7/2}}-\frac{bxe^{a+bx-cx^2}}{4c^2}-\frac{e^{a+bx-cx^2}}{2c^2}-\frac{x^2e^{a+bx-cx^2}}{2c}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x - c*x^2)*x^3,x]
```

```
[Out] -1/8*(b^2*E^(a + b*x - c*x^2))/c^3 - E^(a + b*x - c*x^2)/(2*c^2) - (b*E^(a
+ b*x - c*x^2)*x)/(4*c^2) - (E^(a + b*x - c*x^2)*x^2)/(2*c) - (b^3*E^(a + b
^2/(4*c))*Sqrt[Pi]*Erf[(b - 2*c*x)/(2*Sqrt[c])])/(16*c^(7/2)) - (3*b*E^(a +
 b^2/(4*c))*Sqrt[Pi]*Erf[(b - 2*c*x)/(2*Sqrt[c])])/(8*c^(5/2))
```

Rule 2236

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erf[(c + d*x)*Rt[(-b)*Log[F], 2]]/(2*d*Rt[(-b)*Log[F], 2])), x] /; Fr
eeQ[{F, a, b, c, d}, x] && NegQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2272

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[e*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] - Dist[(b*e - 2*c*d)/(2*
c), Int[F^(a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[
b*e - 2*c*d, 0]
```

Rule 2273

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[e*(d + e*x)^(m - 1)*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] +
 (-Dist[(b*e - 2*c*d)/(2*c), Int[(d + e*x)^(m - 1)*F^(a + b*x + c*x^2), x],
 x] - Dist[(m - 1)*(e^2/(2*c*Log[F])), Int[(d + e*x)^(m - 2)*F^(a + b*x + c
*x^2), x], x]) /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[b*e - 2*c*d, 0] && Gt
Q[m, 1]
```

Rubi steps

$$\int e^{a+bx-cx^2}x^3\,dx = -\frac{e^{a+bx-cx^2}x^2}{2c}+\frac{\int e^{a+bx-cx^2}x\,dx}{c}+\frac{b\int e^{a+bx-cx^2}x^2\,dx}{2c}$$
$$= -\frac{e^{a+bx-cx^2}}{2c^2}-\frac{be^{a+bx-cx^2}x}{4c^2}-\frac{e^{a+bx-cx^2}x^2}{2c}+\frac{b\int e^{a+bx-cx^2}\,dx}{4c^2}+\frac{b\int e^{a+bx-cx^2}\,dx}{2c^2}+\frac{b^2\int e^{\cdots}}{\cdots}$$
$$= -\frac{b^2e^{a+bx-cx^2}}{8c^3}-\frac{e^{a+bx-cx^2}}{2c^2}-\frac{be^{a+bx-cx^2}x}{4c^2}-\frac{e^{a+bx-cx^2}x^2}{2c}+\frac{b^3\int e^{a+bx-cx^2}\,dx}{8c^3}+\frac{\left(be^{a+\frac{b^2}{4c}}\right)\cdots}{\cdots}$$
$$= -\frac{b^2e^{a+bx-cx^2}}{8c^3}-\frac{e^{a+bx-cx^2}}{2c^2}-\frac{be^{a+bx-cx^2}x}{4c^2}-\frac{e^{a+bx-cx^2}x^2}{2c}-\frac{3be^{a+\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{8c^{5/2}}+\frac{(b\cdots}{\cdots}$$
$$= -\frac{b^2e^{a+bx-cx^2}}{8c^3}-\frac{e^{a+bx-cx^2}}{2c^2}-\frac{be^{a+bx-cx^2}x}{4c^2}-\frac{e^{a+bx-cx^2}x^2}{2c}-\frac{b^3e^{a+\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{16c^{7/2}}-\frac{3b\cdots}{\cdots}$$

Mathematica [A]
time = 0.29, size = 91, normalized size = 0.50

$$-\frac{e^a\left(2\sqrt{c}\,e^{x(b-cx)}(b^2+2bcx+4c(1+cx^2))+b(b^2+6c)\,e^{\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)\right)}{16c^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x - c*x^2)*x^3,x]
```

```
[Out] -1/16*(E^a*(2*Sqrt[c]*E^(x*(b - c*x))*(b^2 + 2*b*c*x + 4*c*(1 + c*x^2)) + b
*(b^2 + 6*c)*E^(b^2/(4*c))*Sqrt[Pi]*Erf[(b - 2*c*x)/(2*Sqrt[c])]))/c^(7/2)
```

Maple [A]
time = 0.04, size = 194, normalized size = 1.07

method	result

risch	$-\frac{\mathrm{e}^{-c\,x^2+bx+a}x^2}{2c}-\frac{b\,\mathrm{e}^{-c\,x^2+bx+a}x}{4c^2}-\frac{b^2\mathrm{e}^{-c\,x^2+bx+a}}{8c^3}-\frac{b^3\sqrt{\pi}\,\mathrm{e}^{\frac{4ca+b^2}{4c}}\,\mathrm{erf}\left(-\sqrt{c}\,x+\frac{b}{2\sqrt{c}}\right)}{16c^{\frac{7}{2}}}-\frac{3b\sqrt{\pi}\,\mathrm{e}^{\frac{4ca+b^2}{4c}}\,\mathrm{erf}\left(-\sqrt{\right.}\right.}{8c^{\frac{5}{2}}}$
default	$-\frac{\mathrm{e}^{-c\,x^2+bx+a}x^2}{2c}+\frac{b\left(-\frac{\mathrm{e}^{-c\,x^2+bx+a}x}{2c}+\frac{b\left(-\frac{\mathrm{e}^{-c\,x^2+bx+a}}{2c}-\frac{b\sqrt{\pi}\,\mathrm{e}^{a+\frac{b^2}{4c}}\,\mathrm{erf}\left(-\sqrt{c}\,x+\frac{b}{2\sqrt{c}}\right)}{4c^{\frac{3}{2}}}\right)}{2c}-\frac{\sqrt{\pi}\,\mathrm{e}^{a+\frac{b^2}{4c}}\,\mathrm{erf}\left(-\sqrt{c}\,x+\frac{}{2}\right.}{4c^{\frac{3}{2}}}\right.}{2c}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-c*x^2+b*x+a)*x^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*exp(-c*x^2+b*x+a)*x^2/c+1/2*b/c*(-1/2*exp(-c*x^2+b*x+a)*x/c+1/2*b/c*(-
1/2*exp(-c*x^2+b*x+a)/c-1/4*b/c^(3/2)*Pi^(1/2)*exp(a+1/4*b^2/c)*erf(-c^(1/2
)*x+1/2*b/c^(1/2)))-1/4/c^(3/2)*Pi^(1/2)*exp(a+1/4*b^2/c)*erf(-c^(1/2)*x+1/
2*b/c^(1/2)))+1/c*(-1/2*exp(-c*x^2+b*x+a)/c-1/4*b/c^(3/2)*Pi^(1/2)*exp(a+1/
4*b^2/c)*erf(-c^(1/2)*x+1/2*b/c^(1/2)))
```

Maxima [A]
time = 0.36, size = 181, normalized size = 1.00

$$\frac{\left(\frac{\sqrt{\pi}\,(2\,cx-b)b^3\left(\mathrm{erf}\left(\frac{1}{2}\sqrt{\frac{(2\,cx-b)^2}{c}}\right)-1\right)}{\sqrt{\frac{(2\,cx-b)^2}{c}}\,(-c)^{\frac{7}{2}}}-\frac{6\,b^2ce^{\left(-\frac{(2\,cx-b)^2}{4\,c}\right)}}{(-c)^{\frac{7}{2}}}-\frac{12\,(2\,cx-b)^3b\Gamma\left(\frac{3}{2},\frac{(2\,cx-b)^2}{4\,c}\right)}{\left(\frac{(2\,cx-b)^2}{c}\right)^{\frac{3}{2}}(-c)^{\frac{7}{2}}}-\frac{8\,c^2\Gamma\left(2,\frac{(2\,cx-b)^2}{4\,c}\right)}{(-c)^{\frac{7}{2}}}\right)e^{\left(a+\frac{b^2}{4\,c}\right)}}{16\,\sqrt{-c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)*x^3,x, algorithm="maxima")
```

```
[Out] 1/16*(sqrt(pi)*(2*c*x - b)*b^3*(erf(1/2*sqrt((2*c*x - b)^2/c)) - 1)/(sqrt((
2*c*x - b)^2/c)*(-c)^(7/2)) - 6*b^2*c*e^(-1/4*(2*c*x - b)^2/c)/(-c)^(7/2) -
 12*(2*c*x - b)^3*b*gamma(3/2, 1/4*(2*c*x - b)^2/c)/(((2*c*x - b)^2/c)^(3/2
)*(-c)^(7/2)) - 8*c^2*gamma(2, 1/4*(2*c*x - b)^2/c)/(-c)^(7/2))*e^(a + 1/4*
b^2/c)/sqrt(-c)
```

Fricas [A]
time = 0.36, size = 89, normalized size = 0.49

$$\frac{\sqrt{\pi}\,(b^3+6\,bc)\sqrt{c}\,\mathrm{erf}\left(\frac{2\,cx-b}{2\,\sqrt{c}}\right)e^{\left(\frac{b^2+4\,ac}{4\,c}\right)}-2\,(4\,c^3x^2+2\,bc^2x+b^2c+4\,c^2)e^{(-cx^2+bx+a)}}{16\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)*x^3,x, algorithm="fricas")
```

```
[Out] 1/16*(sqrt(pi)*(b^3 + 6*b*c)*sqrt(c)*erf(1/2*(2*c*x - b)/sqrt(c))*e^(1/4*(b
^2 + 4*a*c)/c) - 2*(4*c^3*x^2 + 2*b*c^2*x + b^2*c + 4*c^2)*e^(-c*x^2 + b*x
+ a))/c^4
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$e^{a}\int x^{3}e^{bx}e^{-cx^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x**2+b*x+a)*x**3,x)
```

```
[Out] exp(a)*Integral(x**3*exp(b*x)*exp(-c*x**2), x)
```

Giac [A]
time = 5.53, size = 104, normalized size = 0.57

$$-\frac{\frac{\sqrt{\pi}\,(b^{3}+6\,bc)\,\mathrm{erf}\left(-\frac{1}{2}\,\sqrt{c}\,\left(2\,x-\frac{b}{c}\right)\right)e^{\left(\frac{b^{2}+4\,ac}{4\,c}\right)}}{\sqrt{c}}+2\left(c^{2}\left(2\,x-\frac{b}{c}\right)^{2}+3\,bc\left(2\,x-\frac{b}{c}\right)+3\,b^{2}+4\,c\right)e^{\left(-cx^{2}+bx+a\right)}}{16\,c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)*x^3,x, algorithm="giac")
```

```
[Out] -1/16*(sqrt(pi)*(b^3 + 6*b*c)*erf(-1/2*sqrt(c)*(2*x - b/c))*e^(1/4*(b^2 + 4
*a*c)/c)/sqrt(c) + 2*(c^2*(2*x - b/c)^2 + 3*b*c*(2*x - b/c) + 3*b^2 + 4*c)*
e^(-c*x^2 + b*x + a))/c^3
```

Mupad [B]
time = 0.30, size = 112, normalized size = 0.62

$$-\mathrm{e}^{-c\,x^{2}+b\,x+a}\,\left(\frac{1}{2\,c^{2}}+\frac{b^{2}}{8\,c^{3}}\right)-\frac{x^{2}\,\mathrm{e}^{-c\,x^{2}+b\,x+a}}{2\,c}-\frac{b\,x\,\mathrm{e}^{-c\,x^{2}+b\,x+a}}{4\,c^{2}}-\frac{\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\frac{b}{2}-c\,x}{\sqrt{-c}}\right)\,\mathrm{e}^{a+\frac{b^{2}}{4\,c}}\,\left(b^{3}+6\,c\,b\right)}{16\,{\left(-c\right)}^{7/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*exp(a + b*x - c*x^2),x)
```

```
[Out] - exp(a + b*x - c*x^2)*(1/(2*c^2) + b^2/(8*c^3)) - (x^2*exp(a + b*x - c*x^2
))/(2*c) - (b*x*exp(a + b*x - c*x^2))/(4*c^2) - (pi^(1/2)*erfi((b/2 - c*x)/
(-c)^(1/2))*exp(a + b^2/(4*c))*(6*b*c + b^3))/(16*(-c)^(7/2))
```

3.433 $\int e^{a+bx-cx^2}x^2\,dx$

Optimal. Leaf size=134

$$-\frac{be^{a+bx-cx^2}}{4c^2}-\frac{e^{a+bx-cx^2}x}{2c}-\frac{b^2e^{a+\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{8c^{5/2}}-\frac{e^{a+\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{4c^{3/2}}$$

```
[Out] -1/4*b*exp(-c*x^2+b*x+a)/c^2-1/2*exp(-c*x^2+b*x+a)*x/c-1/8*b^2*exp(a+1/4*b^
2/c)*erf(1/2*(-2*c*x+b)/c^(1/2))*Pi^(1/2)/c^(5/2)-1/4*exp(a+1/4*b^2/c)*erf(
1/2*(-2*c*x+b)/c^(1/2))*Pi^(1/2)/c^(3/2)
```

Rubi [A]
time = 0.06, antiderivative size = 134, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.235$, Rules used = {2273, 2272, 2266, 2236}

$$-\frac{\sqrt{\pi}\,b^2e^{a+\frac{b^2}{4c}}\mathrm{Erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{8c^{5/2}}-\frac{\sqrt{\pi}\,e^{a+\frac{b^2}{4c}}\mathrm{Erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{4c^{3/2}}-\frac{be^{a+bx-cx^2}}{4c^2}-\frac{xe^{a+bx-cx^2}}{2c}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x - c*x^2)*x^2,x]
```

```
[Out] -1/4*(b*E^(a + b*x - c*x^2))/c^2 - (E^(a + b*x - c*x^2)*x)/(2*c) - (b^2*E^(
a + b^2/(4*c))*Sqrt[Pi]*Erf[(b - 2*c*x)/(2*Sqrt[c])])/(8*c^(5/2)) - (E^(a +
 b^2/(4*c))*Sqrt[Pi]*Erf[(b - 2*c*x)/(2*Sqrt[c])])/(4*c^(3/2))
```

Rule 2236

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erf[(c + d*x)*Rt[(-b)*Log[F], 2]]/(2*d*Rt[(-b)*Log[F], 2])), x] /; Fr
eeQ[{F, a, b, c, d}, x] && NegQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2272

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[e*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] - Dist[(b*e - 2*c*d)/(2*
c), Int[F^(a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[
b*e - 2*c*d, 0]
```

Rule 2273

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[e*(d + e*x)^(m - 1)*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] +
 (-Dist[(b*e - 2*c*d)/(2*c), Int[(d + e*x)^(m - 1)*F^(a + b*x + c*x^2), x],
 x] - Dist[(m - 1)*(e^2/(2*c*Log[F])), Int[(d + e*x)^(m - 2)*F^(a + b*x + c
*x^2), x], x]) /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[b*e - 2*c*d, 0] && Gt
Q[m, 1]
```

Rubi steps

$$\begin{aligned}
\int e^{a+bx-cx^2}x^2\,dx &= -\frac{e^{a+bx-cx^2}x}{2c}+\frac{\int e^{a+bx-cx^2}\,dx}{2c}+\frac{b\int e^{a+bx-cx^2}x\,dx}{2c}\\
&= -\frac{be^{a+bx-cx^2}}{4c^2}-\frac{e^{a+bx-cx^2}x}{2c}+\frac{b^2\int e^{a+bx-cx^2}\,dx}{4c^2}+\frac{e^{a+\frac{b^2}{4c}}\int e^{-\frac{(b-2cx)^2}{4c}}\,dx}{2c}\\
&= -\frac{be^{a+bx-cx^2}}{4c^2}-\frac{e^{a+bx-cx^2}x}{2c}-\frac{e^{a+\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{4c^{3/2}}+\frac{\left(b^2e^{a+\frac{b^2}{4c}}\right)\int e^{-\frac{(b-2cx)^2}{4c}}\,dx}{4c^2}\\
&= -\frac{be^{a+bx-cx^2}}{4c^2}-\frac{e^{a+bx-cx^2}x}{2c}-\frac{b^2e^{a+\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{8c^{5/2}}-\frac{e^{a+\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{4c^{3/2}}
\end{aligned}$$

Mathematica [A]
time = 0.20, size = 79, normalized size = 0.59

$$\frac{e^a\left(-2\sqrt{c}\,e^{x(b-cx)}(b+2cx)+(b^2+2c)\,e^{\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erf}\left(\frac{-b+2cx}{2\sqrt{c}}\right)\right)}{8c^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x - c*x^2)*x^2,x]
[Out] (E^a*(-2*Sqrt[c]*E^(x*(b - c*x))*(b + 2*c*x) + (b^2 + 2*c)*E^(b^2/(4*c))*Sq
rt[Pi]*Erf[(-b + 2*c*x)/(2*Sqrt[c])]))/(8*c^(5/2))
```

Maple [A]
time = 0.02, size = 111, normalized size = 0.83

method	result	si
default	$-\frac{\mathrm{e}^{-c\,x^2+bx+a}x}{2c}+\frac{b\left(-\frac{\mathrm{e}^{-c\,x^2+bx+a}}{2c}-\frac{b\sqrt{\pi}\,\mathrm{e}^{a+\frac{b^2}{4c}}\,\mathrm{erf}\left(-\sqrt{c}\,x+\frac{b}{2\sqrt{c}}\right)}{4c^{\frac{3}{2}}}\right)}{2c}-\frac{\sqrt{\pi}\,\mathrm{e}^{a+\frac{b^2}{4c}}\,\mathrm{erf}\left(-\sqrt{c}\,x+\frac{b}{2\sqrt{c}}\right)}{4c^{\frac{3}{2}}}$	1

risch	$-\frac{\mathrm{e}^{-c\,x^{2}+b x+a} x}{2c}-\frac{b\,\mathrm{e}^{-c\,x^{2}+b x+a}}{4c^{2}}-\frac{b^{2}\sqrt{\pi}\,\mathrm{e}^{\frac{4ca+b^{2}}{4c}}\operatorname{erf}\left(-\sqrt{c}\,x+\frac{b}{2\sqrt{c}}\right)}{8c^{\frac{5}{2}}}-\frac{\sqrt{\pi}\,\mathrm{e}^{\frac{4ca+b^{2}}{4c}}\operatorname{erf}\left(-\sqrt{c}\,x+\frac{b}{2\sqrt{c}}\right)}{4c^{\frac{3}{2}}}$	113

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-c*x^2+b*x+a)*x^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*exp(-c*x^2+b*x+a)*x/c+1/2*b/c*(-1/2*exp(-c*x^2+b*x+a)/c-1/4*b/c^(3/2)*
Pi^(1/2)*exp(a+1/4*b^2/c)*erf(-c^(1/2)*x+1/2*b/c^(1/2)))-1/4/c^(3/2)*Pi^(1/
2)*exp(a+1/4*b^2/c)*erf(-c^(1/2)*x+1/2*b/c^(1/2))
```

Maxima [A]
time = 0.35, size = 151, normalized size = 1.13

$$-\frac{\left(\frac{\sqrt{\pi}\,(2\,cx-b)b^{2}\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{\frac{(2\,cx-b)^{2}}{c}}\right)-1\right)}{\sqrt{\frac{(2\,cx-b)^{2}}{c}}\,(-c)^{\frac{5}{2}}}-\frac{4\,bce^{\left(-\frac{(2\,cx-b)^{2}}{4\,c}\right)}}{(-c)^{\frac{5}{2}}}-\frac{4\,(2\,cx-b)^{3}\Gamma\left(\frac{3}{2},\frac{(2\,cx-b)^{2}}{4\,c}\right)}{\left(\frac{(2\,cx-b)^{2}}{c}\right)^{\frac{3}{2}}(-c)^{\frac{5}{2}}}\right)e^{\left(a+\frac{b^{2}}{4\,c}\right)}}{8\sqrt{-c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)*x^2,x, algorithm="maxima")
```

```
[Out] -1/8*(sqrt(pi)*(2*c*x - b)*b^2*(erf(1/2*sqrt((2*c*x - b)^2/c)) - 1)/(sqrt((
2*c*x - b)^2/c)*(-c)^(5/2)) - 4*b*c*e^(-1/4*(2*c*x - b)^2/c)/(-c)^(5/2) - 4
*(2*c*x - b)^3*gamma(3/2, 1/4*(2*c*x - b)^2/c)/(((2*c*x - b)^2/c)^(3/2)*(-c
)^(5/2)))*e^(a + 1/4*b^2/c)/sqrt(-c)
```

Fricas [A]
time = 0.38, size = 72, normalized size = 0.54

$$\frac{\sqrt{\pi}\,(b^{2}+2\,c)\sqrt{c}\,\operatorname{erf}\left(\frac{2\,cx-b}{2\,\sqrt{c}}\right)e^{\left(\frac{b^{2}+4\,ac}{4\,c}\right)}-2\,(2\,c^{2}x+bc)e^{(-cx^{2}+bx+a)}}{8\,c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)*x^2,x, algorithm="fricas")
```

```
[Out] 1/8*(sqrt(pi)*(b^2 + 2*c)*sqrt(c)*erf(1/2*(2*c*x - b)/sqrt(c))*e^(1/4*(b^2
+ 4*a*c)/c) - 2*(2*c^2*x + b*c)*e^(-c*x^2 + b*x + a))/c^3
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$e^{a}\int x^{2}e^{bx}e^{-cx^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x**2+b*x+a)*x**2,x)
```

```
[Out] exp(a)*Integral(x**2*exp(b*x)*exp(-c*x**2), x)
```

Giac [A]
time = 2.98, size = 80, normalized size = 0.60

$$-\frac{\frac{\sqrt{\pi}\left(b^{2}+2\,c\right)\operatorname{erf}\left(-\frac{1}{2}\,\sqrt{c}\,\left(2\,x-\frac{b}{c}\right)\right)e^{\left(\frac{b^{2}+4\,ac}{4\,c}\right)}}{\sqrt{c}}+2\left(c\left(2\,x-\frac{b}{c}\right)+2\,b\right)e^{\left(-cx^{2}+bx+a\right)}}{8\,c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)*x^2,x, algorithm="giac")
```

```
[Out] -1/8*(sqrt(pi)*(b^2 + 2*c)*erf(-1/2*sqrt(c)*(2*x - b/c))*e^(1/4*(b^2 + 4*a*
c)/c)/sqrt(c) + 2*(c*(2*x - b/c) + 2*b)*e^(-c*x^2 + b*x + a))/c^2
```

Mupad [B]
time = 3.72, size = 80, normalized size = 0.60

$$\frac{\sqrt{\pi}\,\operatorname{erfi}\left(\frac{\frac{b}{2}-c\,x}{\sqrt{-c}}\right)\,\mathrm{e}^{a+\frac{b^2}{4\,c}}\,\left(b^2+2\,c\right)}{8\,{\left(-c\right)}^{5/2}}-\frac{x\,\mathrm{e}^{-c\,x^2+b\,x+a}}{2\,c}-\frac{b\,\mathrm{e}^{-c\,x^2+b\,x+a}}{4\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*exp(a + b*x - c*x^2),x)
```

```
[Out] (pi^(1/2)*erfi((b/2 - c*x)/(-c)^(1/2))*exp(a + b^2/(4*c))*(2*c + b^2))/(8*(
-c)^(5/2)) - (x*exp(a + b*x - c*x^2))/(2*c) - (b*exp(a + b*x - c*x^2))/(4*c
^2)
```

3.434 $\int e^{a+bx-cx^2}x\,dx$

Optimal. Leaf size=66

$$-\frac{e^{a+bx-cx^2}}{2c}-\frac{be^{a+\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{4c^{3/2}}$$

```
[Out] -1/2*exp(-c*x^2+b*x+a)/c-1/4*b*exp(a+1/4*b^2/c)*erf(1/2*(-2*c*x+b)/c^(1/2))
*Pi^(1/2)/c^(3/2)
```

Rubi [A]
time = 0.03, antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2272, 2266, 2236}

$$-\frac{\sqrt{\pi}\,be^{a+\frac{b^2}{4c}}\mathrm{Erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{4c^{3/2}}-\frac{e^{a+bx-cx^2}}{2c}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x - c*x^2)*x,x]
```

```
[Out] -1/2*E^(a + b*x - c*x^2)/c - (b*E^(a + b^2/(4*c))*Sqrt[Pi]*Erf[(b - 2*c*x)/
(2*Sqrt[c])])/(4*c^(3/2))
```

Rule 2236

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erf[(c + d*x)*Rt[(-b)*Log[F], 2]]/(2*d*Rt[(-b)*Log[F], 2])), x] /; Fr
eeQ[{F, a, b, c, d}, x] && NegQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2272

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[e*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] - Dist[(b*e - 2*c*d)/(2*
c), Int[F^(a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[
b*e - 2*c*d, 0]
```

Rubi steps

$$
\begin{aligned}
\int e^{a+bx-cx^2} x\,dx &= -\frac{e^{a+bx-cx^2}}{2c} + \frac{b\int e^{a+bx-cx^2}\,dx}{2c} \\
&= -\frac{e^{a+bx-cx^2}}{2c} + \frac{\left(be^{a+\frac{b^2}{4c}}\right)\int e^{-\frac{(b-2cx)^2}{4c}}\,dx}{2c} \\
&= -\frac{e^{a+bx-cx^2}}{2c} - \frac{be^{a+\frac{b^2}{4c}}\sqrt{\pi}\,\text{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{4c^{3/2}}
\end{aligned}
$$

Mathematica [A]
time = 0.11, size = 68, normalized size = 1.03

$$
-\frac{e^{a+bx-cx^2}}{2c} + \frac{be^{a+\frac{b^2}{4c}}\sqrt{\pi}\,\text{erf}\left(\frac{-b+2cx}{2\sqrt{c}}\right)}{4c^{3/2}}
$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x - c*x^2)*x,x]
```

```
[Out] -1/2*E^(a + b*x - c*x^2)/c + (b*E^(a + b^2/(4*c))*Sqrt[Pi]*Erf[(-b + 2*c*x)
/(2*Sqrt[c])])/(4*c^(3/2))
```

Maple [A]
time = 0.02, size = 53, normalized size = 0.80

method	result	size
default	$-\frac{e^{-c\,x^2+bx+a}}{2c}-\frac{b\sqrt{\pi}\,e^{a+\frac{b^2}{4c}}\,\text{erf}\left(-\sqrt{c}\,x+\frac{b}{2\sqrt{c}}\right)}{4c^{\frac{3}{2}}}$	53
risch	$-\frac{e^{-c\,x^2+bx+a}}{2c}-\frac{b\sqrt{\pi}\,e^{\frac{4ca+b^2}{4c}}\,\text{erf}\left(-\sqrt{c}\,x+\frac{b}{2\sqrt{c}}\right)}{4c^{\frac{3}{2}}}$	56

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-c*x^2+b*x+a)*x,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*exp(-c*x^2+b*x+a)/c-1/4*b/c^(3/2)*Pi^(1/2)*exp(a+1/4*b^2/c)*erf(-c^(1/
2)*x+1/2*b/c^(1/2))
```

Maxima [A]

time = 0.34, size = 98, normalized size = 1.48

$$\frac{\left(\frac{\sqrt{\pi}(2\,cx-b)b\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{\frac{(2\,cx-b)^2}{c}}\right)-1\right)}{\sqrt{\frac{(2\,cx-b)^2}{c}}\,(-c)^{\frac{3}{2}}}-\frac{2\,ce^{\left(-\frac{(2\,cx-b)^2}{4\,c}\right)}}{(-c)^{\frac{3}{2}}}\right)e^{\left(a+\frac{b^2}{4\,c}\right)}}{4\sqrt{-c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)*x,x, algorithm="maxima")
```

```
[Out] 1/4*(sqrt(pi)*(2*c*x - b)*b*(erf(1/2*sqrt((2*c*x - b)^2/c)) - 1)/(sqrt((2*c
*x - b)^2/c)*(-c)^(3/2)) - 2*c*e^(-1/4*(2*c*x - b)^2/c)/(-c)^(3/2))*e^(a +
1/4*b^2/c)/sqrt(-c)
```

Fricas [A]
time = 0.37, size = 57, normalized size = 0.86

$$\frac{\sqrt{\pi}\,b\sqrt{c}\,\operatorname{erf}\left(\frac{2\,cx-b}{2\,\sqrt{c}}\right)e^{\left(\frac{b^2+4\,ac}{4\,c}\right)}-2\,ce^{\left(-cx^2+bx+a\right)}}{4\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)*x,x, algorithm="fricas")
```

```
[Out] 1/4*(sqrt(pi)*b*sqrt(c)*erf(1/2*(2*c*x - b)/sqrt(c))*e^(1/4*(b^2 + 4*a*c)/c
) - 2*c*e^(-c*x^2 + b*x + a))/c^2
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$e^{a}\int xe^{bx}e^{-cx^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x**2+b*x+a)*x,x)
```

```
[Out] exp(a)*Integral(x*exp(b*x)*exp(-c*x**2), x)
```

Giac [A]
time = 3.19, size = 58, normalized size = 0.88

$$-\frac{\frac{\sqrt{\pi}\,b\operatorname{erf}\left(-\frac{1}{2}\,\sqrt{c}\,\left(2\,x-\frac{b}{c}\right)\right)e^{\left(\frac{b^2+4\,ac}{4\,c}\right)}}{\sqrt{c}}+2\,e^{\left(-cx^2+bx+a\right)}}{4\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)*x,x, algorithm="giac")
```

```
[Out] -1/4*(sqrt(pi)*b*erf(-1/2*sqrt(c)*(2*x - b/c))*e^(1/4*(b^2 + 4*a*c)/c)/sqrt
(c) + 2*e^(-c*x^2 + b*x + a))/c
```

Mupad [B]
time = 3.47, size = 58, normalized size = 0.88

$$-\frac{e^{b\,x}\,e^{a}\,e^{-c\,x^2}}{2\,c}-\frac{b\,\sqrt{\pi}\,e^{\frac{b^2}{4\,c}}\,e^{a}\,\mathrm{erfi}\left(\frac{b}{2\,\sqrt{-c}}+\sqrt{-c}\,x\right)}{4\,{\left(-c\right)}^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*exp(a + b*x - c*x^2),x)
```

```
[Out] - (exp(b*x)*exp(a)*exp(-c*x^2))/(2*c) - (b*pi^(1/2)*exp(b^2/(4*c))*exp(a)*e
rfi(b/(2*(-c)^(1/2)) + (-c)^(1/2)*x))/(4*(-c)^(3/2))
```

3.435 $\int e^{a+bx-cx^2}\,dx$

Optimal. Leaf size=44

$$-\frac{e^{a+\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{2\sqrt{c}}$$

```
[Out] -1/2*exp(a+1/4*b^2/c)*erf(1/2*(-2*c*x+b)/c^(1/2))*Pi^(1/2)/c^(1/2)
```

Rubi [A]
time = 0.01, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2266, 2236}

$$-\frac{\sqrt{\pi}\,e^{a+\frac{b^2}{4c}}\,\mathrm{Erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{2\sqrt{c}}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x - c*x^2),x]
[Out] -1/2*(E^(a + b^2/(4*c))*Sqrt[Pi]*Erf[(b - 2*c*x)/(2*Sqrt[c])])/Sqrt[c]
```

Rule 2236

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erf[(c + d*x)*Rt[(-b)*Log[F], 2]]/(2*d*Rt[(-b)*Log[F], 2])), x] /; Fr
eeQ[{F, a, b, c, d}, x] && NegQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rubi steps

$$\begin{aligned}\int e^{a+bx-cx^2}\,dx &= e^{a+\frac{b^2}{4c}}\int e^{-\frac{(b-2cx)^2}{4c}}\,dx\\ &= -\frac{e^{a+\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{2\sqrt{c}}\end{aligned}$$

Mathematica [A]
time = 0.03, size = 46, normalized size = 1.05

$$\frac{e^{a+\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erf}\left(\frac{-b+2cx}{2\sqrt{c}}\right)}{2\sqrt{c}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x - c*x^2),x]
[Out] (E^(a + b^2/(4*c))*Sqrt[Pi]*Erf[(-b + 2*c*x)/(2*Sqrt[c])])/(2*Sqrt[c])
```

Maple [A]
time = 0.01, size = 34, normalized size = 0.77

method	result	size
default	$-\frac{\sqrt{\pi}\,\mathrm{e}^{a+\frac{b^2}{4c}}\,\mathrm{erf}\left(-\sqrt{c}\,x+\frac{b}{2\sqrt{c}}\right)}{2\sqrt{c}}$	34
risch	$-\frac{\sqrt{\pi}\,\mathrm{e}^{\frac{4ca+b^2}{4c}}\,\mathrm{erf}\left(-\sqrt{c}\,x+\frac{b}{2\sqrt{c}}\right)}{2\sqrt{c}}$	37

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-c*x^2+b*x+a),x,method=_RETURNVERBOSE)
[Out] -1/2*Pi^(1/2)*exp(a+1/4*b^2/c)/c^(1/2)*erf(-c^(1/2)*x+1/2*b/c^(1/2))
```

Maxima [A]
time = 0.28, size = 32, normalized size = 0.73

$$\frac{\sqrt{\pi}\,\mathrm{erf}\left(\sqrt{c}\,x-\frac{b}{2\,\sqrt{c}}\right)e^{\left(a+\frac{b^2}{4\,c}\right)}}{2\,\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a),x, algorithm="maxima")
[Out] 1/2*sqrt(pi)*erf(sqrt(c)*x - 1/2*b/sqrt(c))*e^(a + 1/4*b^2/c)/sqrt(c)
```

Fricas [A]
time = 0.39, size = 36, normalized size = 0.82

$$\frac{\sqrt{\pi}\,\mathrm{erf}\left(\frac{2\,cx-b}{2\,\sqrt{c}}\right)e^{\left(\frac{b^2+4\,ac}{4\,c}\right)}}{2\,\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a),x, algorithm="fricas")
```

```
[Out] 1/2*sqrt(pi)*erf(1/2*(2*c*x - b)/sqrt(c))*e^(1/4*(b^2 + 4*a*c)/c)/sqrt(c)
```

Sympy [A]
time = 0.33, size = 41, normalized size = 0.93

$$\frac{\sqrt{\pi}\sqrt{-\frac{1}{c}}\,e^{a+\frac{b^2}{4c}}\operatorname{erfi}\left(\frac{b-2cx}{2\sqrt{-c}}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x**2+b*x+a),x)
```

```
[Out] sqrt(pi)*sqrt(-1/c)*exp(a + b**2/(4*c))*erfi((b - 2*c*x)/(2*sqrt(-c)))/2
```

Giac [A]
time = 1.78, size = 38, normalized size = 0.86

$$-\frac{\sqrt{\pi}\operatorname{erf}\left(-\frac{1}{2}\sqrt{c}\left(2x-\frac{b}{c}\right)\right)e^{\left(\frac{b^2+4ac}{4c}\right)}}{2\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*erf(-1/2*sqrt(c)*(2*x - b/c))*e^(1/4*(b^2 + 4*a*c)/c)/sqrt(c)
```

Mupad [B]
time = 0.03, size = 40, normalized size = 0.91

$$-\frac{\sqrt{\pi}\operatorname{erf}\left(\frac{b\,1\mathrm{i}-c\,x\,2\mathrm{i}}{2\sqrt{-c}}\right)\mathrm{e}^{a+\frac{b^2}{4c}}\,1\mathrm{i}}{2\sqrt{-c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x - c*x^2),x)
```

```
[Out] -(pi^(1/2)*erf((b*1i - c*x*2i)/(2*(-c)^(1/2)))*exp(a + b^2/(4*c))*1i)/(2*(-
c)^(1/2))
```

3.436 $\int \frac{e^{a+bx-cx^2}}{x}\,dx$

Optimal. Leaf size=20

$$\operatorname{Int}\left(\frac{e^{a+bx-cx^2}}{x},x\right)$$

```
[Out] Unintegrable(exp(-c*x^2+b*x+a)/x,x)
```

Rubi [A]
time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{e^{a+bx-cx^2}}{x}\,dx$$

Verification is not applicable to the result.

```
[In] Int[E^(a + b*x - c*x^2)/x,x]
```

```
[Out] Defer[Int][E^(a + b*x - c*x^2)/x, x]
```

Rubi steps

$$\int \frac{e^{a+bx-cx^2}}{x}\,dx = \int \frac{e^{a+bx-cx^2}}{x}\,dx$$

Mathematica [A]
time = 0.19, size = 0, normalized size = 0.00

$$\int \frac{e^{a+bx-cx^2}}{x}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[E^(a + b*x - c*x^2)/x,x]
```

```
[Out] Integrate[E^(a + b*x - c*x^2)/x, x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{e}^{-c\,x^2+bx+a}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-c*x^2+b*x+a)/x,x)
```

```
[Out] int(exp(-c*x^2+b*x+a)/x,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)/x,x, algorithm="maxima")
```

```
[Out] integrate(e^(-c*x^2 + b*x + a)/x, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)/x,x, algorithm="fricas")
```

```
[Out] integral(e^(-c*x^2 + b*x + a)/x, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$e^{a}\int\frac{e^{bx}e^{-cx^{2}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x**2+b*x+a)/x,x)
```

```
[Out] exp(a)*Integral(exp(b*x)*exp(-c*x**2)/x, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)/x,x, algorithm="giac")
```

```
[Out] integrate(e^(-c*x^2 + b*x + a)/x, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{e^{-c x^2+b x+a}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x - c*x^2)/x,x)
```

```
[Out] int(exp(a + b*x - c*x^2)/x, x)
```

3.437 $\int \frac{e^{a+bx-cx^2}}{x^2}\,dx$

Optimal. Leaf size=82

$$-\frac{e^{a+bx-cx^2}}{x}+\sqrt{c}\,e^{a+\frac{b^2}{4c}}\sqrt{\pi}\,\text{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)+b\text{Int}\left(\frac{e^{a+bx-cx^2}}{x},x\right)$$

```
[Out] -exp(-c*x^2+b*x+a)/x+exp(a+1/4*b^2/c)*erf(1/2*(-2*c*x+b)/c^(1/2))*c^(1/2)*P
i^(1/2)+b*Unintegrable(exp(-c*x^2+b*x+a)/x,x)
```

Rubi [A]
time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}=0.000$, Rules used = {}

$$\int \frac{e^{a+bx-cx^2}}{x^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[E^(a + b*x - c*x^2)/x^2,x]
```

```
[Out] -(E^(a + b*x - c*x^2)/x) + Sqrt[c]*E^(a + b^2/(4*c))*Sqrt[Pi]*Erf[(b - 2*c*
x)/(2*Sqrt[c])] + b*Defer[Int][E^(a + b*x - c*x^2)/x, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{a+bx-cx^2}}{x^2}\,dx &= -\frac{e^{a+bx-cx^2}}{x}+b\int \frac{e^{a+bx-cx^2}}{x}\,dx-(2c)\int e^{a+bx-cx^2}\,dx\\ &= -\frac{e^{a+bx-cx^2}}{x}+b\int \frac{e^{a+bx-cx^2}}{x}\,dx-\left(2ce^{a+\frac{b^2}{4c}}\right)\int e^{-\frac{(b-2cx)^2}{4c}}\,dx\\ &= -\frac{e^{a+bx-cx^2}}{x}+\sqrt{c}\,e^{a+\frac{b^2}{4c}}\sqrt{\pi}\,\text{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)+b\int \frac{e^{a+bx-cx^2}}{x}\,dx\end{aligned}$$

Mathematica [A]
time = 0.35, size = 0, normalized size = 0.00

$$\int \frac{e^{a+bx-cx^2}}{x^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[E^(a + b*x - c*x^2)/x^2,x]
```

```
[Out] Integrate[E^(a + b*x - c*x^2)/x^2, x]
```

Maple [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{e}^{-c\,x^2+b x+a}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-c*x^2+b*x+a)/x^2,x)
[Out] int(exp(-c*x^2+b*x+a)/x^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)/x^2,x, algorithm="maxima")
[Out] integrate(e^(-c*x^2 + b*x + a)/x^2, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)/x^2,x, algorithm="fricas")
[Out] integral(e^(-c*x^2 + b*x + a)/x^2, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$e^{a}\int \frac{e^{bx}e^{-cx^2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x**2+b*x+a)/x**2,x)
[Out] exp(a)*Integral(exp(b*x)*exp(-c*x**2)/x**2, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)/x^2,x, algorithm="giac")
```

```
[Out] integrate(e^(-c*x^2 + b*x + a)/x^2, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{e^{-c x^2+b x+a}}{x^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x - c*x^2)/x^2,x)
```

```
[Out] int(exp(a + b*x - c*x^2)/x^2, x)
```

3.438 $\int e^{(a+bx)(c+dx)}x^3\,dx$

Optimal. Leaf size=297

$$-\frac{e^{ac+(bc+ad)x+bdx^2}}{2b^2d^2}+\frac{(bc+ad)^2e^{ac+(bc+ad)x+bdx^2}}{8b^3d^3}-\frac{(bc+ad)e^{ac+(bc+ad)x+bdx^2}x}{4b^2d^2}+\frac{e^{ac+(bc+ad)x+bdx^2}x^2}{2bd}+\frac{3(bc+ad)}{}$$

```
[Out] -1/2*exp(a*c+(a*d+b*c)*x+b*d*x^2)/b^2/d^2+1/8*(a*d+b*c)^2*exp(a*c+(a*d+b*c)
*x+b*d*x^2)/b^3/d^3-1/4*(a*d+b*c)*exp(a*c+(a*d+b*c)*x+b*d*x^2)*x/b^2/d^2+1/
2*exp(a*c+(a*d+b*c)*x+b*d*x^2)*x^2/b/d+3/8*(a*d+b*c)*erfi(1/2*(2*b*d*x+a*d+
b*c)/b^(1/2)/d^(1/2))*Pi^(1/2)/b^(5/2)/d^(5/2)/exp(1/4*(-a*d+b*c)^2/b/d)-1/
16*(a*d+b*c)^3*erfi(1/2*(2*b*d*x+a*d+b*c)/b^(1/2)/d^(1/2))*Pi^(1/2)/b^(7/2)
/d^(7/2)/exp(1/4*(-a*d+b*c)^2/b/d)
```

Rubi [A]
time = 0.45, antiderivative size = 297, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.294$, Rules used = {2276, 2273, 2272, 2266, 2235}

$$-\frac{\sqrt{\pi}\,e^{-\frac{(bc-ad)^2}{4bd}}(ad+bc)^3\text{Erfi}\left(\frac{ad+bc+2bdx}{2\sqrt{b}\sqrt{d}}\right)}{16b^{7/2}d^{7/2}}+\frac{3\sqrt{\pi}\,e^{-\frac{(bc-ad)^2}{4bd}}(ad+bc)\text{Erfi}\left(\frac{ad+bc+2bdx}{2\sqrt{b}\sqrt{d}}\right)}{8b^{5/2}d^{5/2}}+\frac{(ad+bc)^2e^{x(ad+bc)+ac+bdx^2}}{8b^3d^3}-\frac{x(ad+bc)e^{x(ad+bc)+ac+bdx^2}}{4b^2d^2}-\frac{e^{x(ad+bc)+ac+bdx^2}}{2b^2d^2}+\frac{x^2e^{x(ad+bc)+ac+bdx^2}}{2bd}$$

Antiderivative was successfully verified.

```
[In] Int[E^((a + b*x)*(c + d*x))*x^3,x]
```

```
[Out] -1/2*E^(a*c + (b*c + a*d)*x + b*d*x^2)/(b^2*d^2) + ((b*c + a*d)^2*E^(a*c +
(b*c + a*d)*x + b*d*x^2))/(8*b^3*d^3) - ((b*c + a*d)*E^(a*c + (b*c + a*d)*x
 + b*d*x^2)*x)/(4*b^2*d^2) + (E^(a*c + (b*c + a*d)*x + b*d*x^2)*x^2)/(2*b*d
) + (3*(b*c + a*d)*Sqrt[Pi]*Erfi[(b*c + a*d + 2*b*d*x)/(2*Sqrt[b]*Sqrt[d])]
)/(8*b^(5/2)*d^(5/2)*E^((b*c - a*d)^2/(4*b*d))) - ((b*c + a*d)^3*Sqrt[Pi]*E
rfi[(b*c + a*d + 2*b*d*x)/(2*Sqrt[b]*Sqrt[d])])/(16*b^(7/2)*d^(7/2)*E^((b*c
 - a*d)^2/(4*b*d)))
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2272

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[e*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] - Dist[(b*e - 2*c*d)/(2*
c), Int[F^(a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[
b*e - 2*c*d, 0]
```

Rule 2273

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[e*(d + e*x)^(m - 1)*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] +
 (-Dist[(b*e - 2*c*d)/(2*c), Int[(d + e*x)^(m - 1)*F^(a + b*x + c*x^2), x],
 x] - Dist[(m - 1)*(e^2/(2*c*Log[F])), Int[(d + e*x)^(m - 2)*F^(a + b*x + c
*x^2), x], x]) /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[b*e - 2*c*d, 0] && Gt
Q[m, 1]
```

Rule 2276

```
Int[(F_)^(v_)*(u_)^(m_.), x_Symbol] :> Int[ExpandToSum[u, x]^m*F^ExpandToSu
m[v, x], x] /; FreeQ[{F, m}, x] && LinearQ[u, x] && QuadraticQ[v, x] &&  !(
LinearMatchQ[u, x] && QuadraticMatchQ[v, x])
```

Rubi steps

$$\begin{aligned}
\int e^{(a+bx)(c+dx)}x^3\,dx &= \int e^{ac+(bc+ad)x+bdx^2}x^3\,dx\\
&= \frac{e^{ac+(bc+ad)x+bdx^2}x^2}{2bd} - \frac{\int e^{ac+(bc+ad)x+bdx^2}x\,dx}{bd} - \frac{(bc+ad)\int e^{ac+(bc+ad)x+bdx^2}x^2\,dx}{2bd}\\
&= -\frac{e^{ac+(bc+ad)x+bdx^2}}{2b^2d^2} - \frac{(bc+ad)e^{ac+(bc+ad)x+bdx^2}x}{4b^2d^2} + \frac{e^{ac+(bc+ad)x+bdx^2}x^2}{2bd} + \frac{(bc+ad)\int e^{a}\cdots}{4\cdots}\\
&= -\frac{e^{ac+(bc+ad)x+bdx^2}}{2b^2d^2} + \frac{(bc+ad)^2e^{ac+(bc+ad)x+bdx^2}}{8b^3d^3} - \frac{(bc+ad)e^{ac+(bc+ad)x+bdx^2}x}{4b^2d^2} + \frac{e^{ac+(b\cdots}}{\cdots}\\
&= -\frac{e^{ac+(bc+ad)x+bdx^2}}{2b^2d^2} + \frac{(bc+ad)^2e^{ac+(bc+ad)x+bdx^2}}{8b^3d^3} - \frac{(bc+ad)e^{ac+(bc+ad)x+bdx^2}x}{4b^2d^2} + \frac{e^{ac+(b\cdots}}{\cdots}\\
&= -\frac{e^{ac+(bc+ad)x+bdx^2}}{2b^2d^2} + \frac{(bc+ad)^2e^{ac+(bc+ad)x+bdx^2}}{8b^3d^3} - \frac{(bc+ad)e^{ac+(bc+ad)x+bdx^2}x}{4b^2d^2} + \frac{e^{ac+(b\cdots}}{\cdots}
\end{aligned}$$

Mathematica [A]
time = 0.53, size = 191, normalized size = 0.64

$$\frac{e^{-\frac{(bc-ad)^2}{4bd}}\left(2\sqrt{b}\,\sqrt{d}\,e^{\frac{(ad+b(c+2dx))^2}{4bd}}(a^2d^2-2bd(2-ac+adx)+b^2(c^2-2cdx+4d^2x^2))-(b^3c^3+3b^2c(-2+ac)d+3ab(-2+ac)d^2+a^3d^3)\sqrt{\pi}\,\mathrm{erfi}\left(\frac{ad+b(c+2dx)}{2\sqrt{b}\,\sqrt{d}}\right)\right)}{16b^{7/2}d^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^((a + b*x)*(c + d*x))*x^3,x]
```

```
[Out] (2*Sqrt[b]*Sqrt[d]*E^((a*d + b*(c + 2*d*x))^2/(4*b*d))*(a^2*d^2 - 2*b*d*(2
- a*c + a*d*x) + b^2*(c^2 - 2*c*d*x + 4*d^2*x^2)) - (b^3*c^3 + 3*b^2*c*(-2
+ a*c)*d + 3*a*b*(-2 + a*c)*d^2 + a^3*d^3)*Sqrt[Pi]*Erfi[(a*d + b*(c + 2*d*
x))/(2*Sqrt[b]*Sqrt[d])])/(16*b^(7/2)*d^(7/2)*E^((b*c - a*d)^2/(4*b*d)))
```

Maple [A]
time = 0.05, size = 368, normalized size = 1.24

method	result
default	$\frac{\mathrm{e}^{ca+(ad+cb)x+bd\,x^2} x^2}{2bd} - \frac{(ad+cb)\left(\frac{\mathrm{e}^{ca+(ad+cb)x+bd\,x^2} x}{2bd} - \frac{(ad+cb)\left(\frac{\mathrm{e}^{ca+(ad+cb)x+bd\,x^2}}{2bd} + \frac{(ad+cb)\sqrt{\pi}\,\mathrm{e}^{ca-\frac{(ad+cb)^2}{4bd}}\,\mathrm{erf}\left(-\sqrt{-bd}\cdots\right.}{4bd\sqrt{-bd}\cdots}\cdots\right.}{2bd}\cdots\right.}{2bd}\cdots$
risch	$\frac{\mathrm{e}^{(bx+a)(dx+c)} x^2}{2bd} - \frac{\mathrm{e}^{(bx+a)(dx+c)} xa}{4b^2 d} - \frac{\mathrm{e}^{(bx+a)(dx+c)} xc}{4b\,d^2} + \frac{\mathrm{e}^{(bx+a)(dx+c)} a^2}{8b^3 d} + \frac{\mathrm{e}^{(bx+a)(dx+c)} ac}{4b^2 d^2} + \frac{\mathrm{e}^{(bx+a)(dx+c)} c^2}{8b\,d^3} + \frac{\sqrt{\pi}\cdots}{\cdots}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((b*x+a)*(d*x+c))*x^3,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*exp(c*a+(a*d+b*c)*x+b*d*x^2)*x^2/b/d-1/2*(a*d+b*c)/b/d*(1/2*exp(c*a+(a*
d+b*c)*x+b*d*x^2)*x/b/d-1/2*(a*d+b*c)/b/d*(1/2*exp(c*a+(a*d+b*c)*x+b*d*x^2)
/b/d+1/4*(a*d+b*c)/b/d*Pi^(1/2)*exp(c*a-1/4*(a*d+b*c)^2/b/d)/(-b*d)^(1/2)*e
rf(-(-b*d)^(1/2)*x+1/2*(a*d+b*c)/(-b*d)^(1/2)))+1/4/b/d*Pi^(1/2)*exp(c*a-1/
4*(a*d+b*c)^2/b/d)/(-b*d)^(1/2)*erf(-(-b*d)^(1/2)*x+1/2*(a*d+b*c)/(-b*d)^(1
/2)))-1/b/d*(1/2*exp(c*a+(a*d+b*c)*x+b*d*x^2)/b/d+1/4*(a*d+b*c)/b/d*Pi^(1/2
)*exp(c*a-1/4*(a*d+b*c)^2/b/d)/(-b*d)^(1/2)*erf(-(-b*d)^(1/2)*x+1/2*(a*d+b*
c)/(-b*d)^(1/2)))
```

Maxima [A]
time = 0.38, size = 267, normalized size = 0.90

$$-\frac{\left(\frac{\sqrt{\pi}(2\,bdx+bc+ad)(bc+ad)^3\left(\mathrm{erf}\left(\frac{1}{2}\sqrt{-\frac{(2\,bdx+bc+ad)^2}{bd}}\right)-1\right)}{(bd)^{\frac{7}{2}}\sqrt{-\frac{(2\,bdx+bc+ad)^2}{bd}}} - \frac{6\,(bc+ad)^2bde^{\left(\frac{(2\,bdx+bc+ad)^2}{4\,bd}\right)}}{(bd)^{\frac{7}{2}}} + \frac{8\,b^2d^2\Gamma\left(2,-\frac{(2\,bdx+bc+ad)^2}{4\,bd}\right)}{(bd)^{\frac{7}{2}}} - \frac{12\,(2\,bdx+bc+ad)^3(bc+ad)\Gamma\left(\frac{3}{2},-\frac{(2\,bdx+bc+ad)^2}{4\,bd}\right)}{(bd)^{\frac{7}{2}}\left(-\frac{(2\,bdx+bc+ad)^2}{bd}\right)^{\frac{3}{2}}}\right)e^{\left(ac-\frac{(bc+ad)^2}{4\,bd}\right)}}{16\,\sqrt{bd}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))*x^3,x, algorithm="maxima")
```

```
[Out] -1/16*(sqrt(pi)*(2*b*d*x + b*c + a*d)*(b*c + a*d)^3*(erf(1/2*sqrt(-(2*b*d*x
 + b*c + a*d)^2/(b*d))) - 1)/((b*d)^(7/2)*sqrt(-(2*b*d*x + b*c + a*d)^2/(b*
d))) - 6*(b*c + a*d)^2*b*d*e^(1/4*(2*b*d*x + b*c + a*d)^2/(b*d))/(b*d)^(7/2
) + 8*b^2*d^2*gamma(2, -1/4*(2*b*d*x + b*c + a*d)^2/(b*d))/(b*d)^(7/2) - 12
*(2*b*d*x + b*c + a*d)^3*(b*c + a*d)*gamma(3/2, -1/4*(2*b*d*x + b*c + a*d)^
2/(b*d))/((b*d)^(7/2)*(-(2*b*d*x + b*c + a*d)^2/(b*d))^(3/2)))*e^(a*c - 1/4
*(b*c + a*d)^2/(b*d))/sqrt(b*d)
```

Fricas [A]
time = 0.39, size = 212, normalized size = 0.71

$$\frac{\sqrt{\pi}\,(b^3c^3 + a^3d^3 + 3\,(a^2bc - 2\,ab)d^2 + 3\,(ab^2c^2 - 2\,b^2c)d)\sqrt{-bd}\,\operatorname{erf}\left(\frac{(2\,bdx+bc+ad)\sqrt{-bd}}{2\,bd}\right)e^{\left(-\frac{b^2c^2-2\,abcd+a^2d^2}{4\,bd}\right)} + 2\,(4\,b^3d^3x^2 + b^3c^2d + a^2bd^3 + 2\,(ab^2c - 2\,b^2)d^2 - 2\,(b^3cd^2 + ab^2d^3)x)e^{(bdx^2+ac+(bc+ad)x)}}{16\,b^4d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))*x^3,x, algorithm="fricas")
```

```
[Out] 1/16*(sqrt(pi)*(b^3*c^3 + a^3*d^3 + 3*(a^2*b*c - 2*a*b)*d^2 + 3*(a*b^2*c^2
- 2*b^2*c)*d)*sqrt(-b*d)*erf(1/2*(2*b*d*x + b*c + a*d)*sqrt(-b*d)/(b*d))*e^
(-1/4*(b^2*c^2 - 2*a*b*c*d + a^2*d^2)/(b*d)) + 2*(4*b^3*d^3*x^2 + b^3*c^2*d
 + a^2*b*d^3 + 2*(a*b^2*c - 2*b^2)*d^2 - 2*(b^3*c*d^2 + a*b^2*d^3)*x)*e^(b*
d*x^2 + a*c + (b*c + a*d)*x))/(b^4*d^4)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))*x**3,x)
```

```
[Out] Timed out
```

Giac [A]
time = 2.52, size = 250, normalized size = 0.84

$$\frac{\frac{\sqrt{\pi}\,(b^3c^3+3\,ab^2c^2d+3\,a^2bcd^2+a^3d^3-6\,b^2cd-6\,abd^2)\operatorname{erf}\left(-\frac{1}{2}\sqrt{-bd}\left(2\,x+\frac{bc+ad}{bd}\right)\right)e^{\left(-\frac{b^2c^2-2\,abcd+a^2d^2}{4\,bd}\right)}}{\sqrt{-bd}} + 2\left(b^2d^2\left(2\,x+\frac{bc+ad}{bd}\right)^2 - 3\,b^2cd\left(2\,x+\frac{bc+ad}{bd}\right) - 3\,abd^2\left(2\,x+\frac{bc+ad}{bd}\right) + 3\,b^2c^2 + 6\,abcd + 3\,a^2d^2 - 4\,bd\right)e^{(bdx^2+bcx+adx+ac)}}{16\,b^3d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))*x^3,x, algorithm="giac")
```

```
[Out] 1/16*(sqrt(pi)*(b^3*c^3 + 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 + a^3*d^3 - 6*b^2*c
*d - 6*a*b*d^2)*erf(-1/2*sqrt(-b*d)*(2*x + (b*c + a*d)/(b*d)))*e^(-1/4*(b^2
*c^2 - 2*a*b*c*d + a^2*d^2)/(b*d))/sqrt(-b*d) + 2*(b^2*d^2*(2*x + (b*c + a*
d)/(b*d))^2 - 3*b^2*c*d*(2*x + (b*c + a*d)/(b*d)) - 3*a*b*d^2*(2*x + (b*c +
```

```
 a*d)/(b*d)) + 3*b^2*c^2 + 6*a*b*c*d + 3*a^2*d^2 - 4*b*d)*e^(b*d*x^2 + b*c*
x + a*d*x + a*c))/(b^3*d^3)
```

Mupad [B]
time = 3.69, size = 230, normalized size = 0.77

$$\frac{e^{a c+a d x+b c x+b d x^2}\left(\frac{a^2 d^2}{8}-b\left(\frac{d}{2}-\frac{a c d}{4}\right)+\frac{b^2 c^2}{8}\right)}{b^3 d^3}+\frac{x^2 e^{a c+a d x+b c x+b d x^2}}{2 b d}-\frac{x e^{a c+a d x+b c x+b d x^2}(a d+b c)}{4 b^2 d^2}-\frac{\sqrt{\pi}\, e^{\frac{a c}{2}-\frac{a^2 d}{4 b}-\frac{b c^2}{4 d}} \operatorname{erfi}\left(\frac{\frac{a d}{2}+\frac{b c}{2}+b d x}{\sqrt{b d}}\right)(a^3 d^3+3 a^2 b c d^2+3 a b^2 c^2 d-6 a b d^2+b^3 c^3-6 b^2 c d)}{16 b^3 d^3 \sqrt{b d}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*exp((a + b*x)*(c + d*x)),x)
```

```
[Out] (exp(a*c + a*d*x + b*c*x + b*d*x^2)*((a^2*d^2)/8 - b*(d/2 - (a*c*d)/4) + (b
^2*c^2)/8))/(b^3*d^3) + (x^2*exp(a*c + a*d*x + b*c*x + b*d*x^2))/(2*b*d) -
(x*exp(a*c + a*d*x + b*c*x + b*d*x^2)*(a*d + b*c))/(4*b^2*d^2) - (pi^(1/2)*
exp((a*c)/2 - (a^2*d)/(4*b) - (b*c^2)/(4*d))*erfi(((a*d)/2 + (b*c)/2 + b*d*
x)/(b*d)^(1/2))*(a^3*d^3 + b^3*c^3 - 6*a*b*d^2 - 6*b^2*c*d + 3*a*b^2*c^2*d
+ 3*a^2*b*c*d^2))/(16*b^3*d^3*(b*d)^(1/2))
```

3.439 $\int e^{(a+bx)(c+dx)}x^2\,dx$

Optimal. Leaf size=216

$$-\frac{(bc+ad)e^{ac+(bc+ad)x+bdx^2}}{4b^2d^2}+\frac{e^{ac+(bc+ad)x+bdx^2}x}{2bd}-\frac{e^{-\frac{(bc-ad)^2}{4bd}}\sqrt{\pi}\,\text{erfi}\left(\frac{bc+ad+2bdx}{2\sqrt{b}\,\sqrt{d}}\right)}{4b^{3/2}d^{3/2}}+\frac{(bc+ad)^2e^{-\frac{(bc-ad)^2}{4bd}}\sqrt{\pi}\,\text{erfi}\left(\frac{bc+ad+2bdx}{2\sqrt{b}\,\sqrt{d}}\right)}{8b^{5/2}d^{5/2}}$$

```
[Out] -1/4*(a*d+b*c)*exp(a*c+(a*d+b*c)*x+b*d*x^2)/b^2/d^2+1/2*exp(a*c+(a*d+b*c)*x
+b*d*x^2)*x/b/d-1/4*erfi(1/2*(2*b*d*x+a*d+b*c)/b^(1/2)/d^(1/2))*Pi^(1/2)/b^
(3/2)/d^(3/2)/exp(1/4*(-a*d+b*c)^2/b/d)+1/8*(a*d+b*c)^2*erfi(1/2*(2*b*d*x+a
*d+b*c)/b^(1/2)/d^(1/2))*Pi^(1/2)/b^(5/2)/d^(5/2)/exp(1/4*(-a*d+b*c)^2/b/d)
```

Rubi [A]
time = 0.19, antiderivative size = 216, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.294$, Rules used = {2276, 2273, 2272, 2266, 2235}

$$\frac{\sqrt{\pi}\,e^{-\frac{(bc-ad)^2}{4bd}}(ad+bc)^2\text{Erfi}\left(\frac{ad+bc+2bdx}{2\sqrt{b}\,\sqrt{d}}\right)}{8b^{5/2}d^{5/2}}-\frac{\sqrt{\pi}\,e^{-\frac{(bc-ad)^2}{4bd}}\text{Erfi}\left(\frac{ad+bc+2bdx}{2\sqrt{b}\,\sqrt{d}}\right)}{4b^{3/2}d^{3/2}}-\frac{(ad+bc)e^{x(ad+bc)+ac+bdx^2}}{4b^2d^2}+\frac{xe^{x(ad+bc)+ac+bdx^2}}{2bd}$$

Antiderivative was successfully verified.

```
[In] Int[E^((a + b*x)*(c + d*x))*x^2,x]
```

```
[Out] -1/4*((b*c + a*d)*E^(a*c + (b*c + a*d)*x + b*d*x^2))/(b^2*d^2) + (E^(a*c +
(b*c + a*d)*x + b*d*x^2)*x)/(2*b*d) - (Sqrt[Pi]*Erfi[(b*c + a*d + 2*b*d*x)/
(2*Sqrt[b]*Sqrt[d])])/(4*b^(3/2)*d^(3/2)*E^((b*c - a*d)^2/(4*b*d))) + ((b*c
 + a*d)^2*Sqrt[Pi]*Erfi[(b*c + a*d + 2*b*d*x)/(2*Sqrt[b]*Sqrt[d])])/(8*b^(5
/2)*d^(5/2)*E^((b*c - a*d)^2/(4*b*d)))
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2272

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[e*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] - Dist[(b*e - 2*c*d)/(2*
c), Int[F^(a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[
```

```
b*e - 2*c*d, 0]
```

Rule 2273

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[e*(d + e*x)^(m - 1)*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] +
 (-Dist[(b*e - 2*c*d)/(2*c), Int[(d + e*x)^(m - 1)*F^(a + b*x + c*x^2), x],
 x] - Dist[(m - 1)*(e^2/(2*c*Log[F])), Int[(d + e*x)^(m - 2)*F^(a + b*x + c
*x^2), x], x]) /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[b*e - 2*c*d, 0] && Gt
Q[m, 1]
```

Rule 2276

```
Int[(F_)^(v_)*(u_)^(m_.), x_Symbol] :> Int[ExpandToSum[u, x]^m*F^ExpandToSu
m[v, x], x] /; FreeQ[{F, m}, x] && LinearQ[u, x] && QuadraticQ[v, x] &&  !(
LinearMatchQ[u, x] && QuadraticMatchQ[v, x])
```

Rubi steps

$$\int e^{(a+bx)(c+dx)}x^2\,dx = \int e^{ac+(bc+ad)x+bdx^2}x^2\,dx$$

$$= \frac{e^{ac+(bc+ad)x+bdx^2}x}{2bd} - \frac{\int e^{ac+(bc+ad)x+bdx^2}\,dx}{2bd} - \frac{(bc+ad)\int e^{ac+(bc+ad)x+bdx^2}x\,dx}{2bd}$$

$$= -\frac{(bc+ad)e^{ac+(bc+ad)x+bdx^2}}{4b^2d^2} + \frac{e^{ac+(bc+ad)x+bdx^2}x}{2bd} + \frac{(bc+ad)^2\int e^{ac+(bc+ad)x+bdx^2}\,dx}{4b^2d^2} -$$

$$= -\frac{(bc+ad)e^{ac+(bc+ad)x+bdx^2}}{4b^2d^2} + \frac{e^{ac+(bc+ad)x+bdx^2}x}{2bd} - \frac{e^{-\frac{(bc-ad)^2}{4bd}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{bc+ad+2bdx}{2\sqrt{b}\sqrt{d}}\right)}{4b^{3/2}d^{3/2}} +$$

$$= -\frac{(bc+ad)e^{ac+(bc+ad)x+bdx^2}}{4b^2d^2} + \frac{e^{ac+(bc+ad)x+bdx^2}x}{2bd} - \frac{e^{-\frac{(bc-ad)^2}{4bd}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{bc+ad+2bdx}{2\sqrt{b}\sqrt{d}}\right)}{4b^{3/2}d^{3/2}} +$$

Mathematica [A]
time = 0.36, size = 144, normalized size = 0.67

$$\frac{e^{-\frac{(bc-ad)^2}{4bd}}\left(-2\sqrt{b}\sqrt{d}\,e^{\frac{(ad+b(c+2dx))^2}{4bd}}(ad+b(c-2dx))+(b^2c^2+2b(-1+ac)d+a^2d^2)\sqrt{\pi}\,\mathrm{erfi}\left(\frac{ad+b(c+2dx)}{2\sqrt{b}\sqrt{d}}\right)\right)}{8b^{5/2}d^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^((a + b*x)*(c + d*x))*x^2,x]
```

```
[Out] (-2*Sqrt[b]*Sqrt[d]*E^((a*d + b*(c + 2*d*x))^2/(4*b*d))*(a*d + b*(c - 2*d*x
)) + (b^2*c^2 + 2*b*(-1 + a*c)*d + a^2*d^2)*Sqrt[Pi]*Erfi[(a*d + b*(c + 2*d
*x))/(2*Sqrt[b]*Sqrt[d])])/(8*b^(5/2)*d^(5/2)*E^((b*c - a*d)^2/(4*b*d)))
```

Maple [A]
time = 0.02, size = 212, normalized size = 0.98

method	result
default	$\frac{e^{ca+(ad+cb)x+bd\,x^2}x}{2bd}-\frac{(ad+cb)\left(\frac{e^{ca+(ad+cb)x+bd\,x^2}}{2bd}+\frac{(ad+cb)\sqrt{\pi}\,e^{ca-\frac{(ad+cb)^2}{4bd}}\operatorname{erf}\left(-\sqrt{-bd}\,x+\frac{ad+cb}{2\sqrt{-bd}}\right)}{4bd\sqrt{-bd}}\right)}{2bd}+\frac{\sqrt{\pi}\,e^{ca-}}{}$
risch	$\frac{e^{(bx+a)(dx+c)}x}{2bd}-\frac{e^{(bx+a)(dx+c)}a}{4b^2d}-\frac{e^{(bx+a)(dx+c)}c}{4b\,d^2}-\frac{\sqrt{\pi}\,e^{-\frac{(ad-cb)^2}{4bd}}\operatorname{erf}\left(-\sqrt{-bd}\,x+\frac{ad+cb}{2\sqrt{-bd}}\right)a^2}{8b^2\sqrt{-bd}}-\frac{\sqrt{\pi}\,e^{-\frac{(ad-cb)^2}{4bd}}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((b*x+a)*(d*x+c))*x^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*exp(c*a+(a*d+b*c)*x+b*d*x^2)*x/b/d-1/2*(a*d+b*c)/b/d*(1/2*exp(c*a+(a*d+
b*c)*x+b*d*x^2)/b/d+1/4*(a*d+b*c)/b/d*Pi^(1/2)*exp(c*a-1/4*(a*d+b*c)^2/b/d)
/(-b*d)^(1/2)*erf(-(-b*d)^(1/2)*x+1/2*(a*d+b*c)/(-b*d)^(1/2)))+1/4/b/d*Pi^(
1/2)*exp(c*a-1/4*(a*d+b*c)^2/b/d)/(-b*d)^(1/2)*erf(-(-b*d)^(1/2)*x+1/2*(a*d
+b*c)/(-b*d)^(1/2))
```

Maxima [A]
time = 0.36, size = 221, normalized size = 1.02

$$\frac{\left(\frac{\sqrt{\pi}\,(2\,bdx+bc+ad)(bc+ad)^2\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2\,bdx+bc+ad)^2}{bd}}\right)-1\right)}{(bd)^{\frac{5}{2}}\sqrt{-\frac{(2\,bdx+bc+ad)^2}{bd}}}-\frac{4\,(bc+ad)bde^{\left(\frac{(2\,bdx+bc+ad)^2}{4\,bd}\right)}}{(bd)^{\frac{5}{2}}}-\frac{4\,(2\,bdx+bc+ad)^3\Gamma\left(\frac{3}{2},-\frac{(2\,bdx+bc+ad)^2}{4\,bd}\right)}{(bd)^{\frac{5}{2}}\left(-\frac{(2\,bdx+bc+ad)^2}{bd}\right)^{\frac{3}{2}}}\right)e^{\left(ac-\frac{(bc+ad)^2}{4\,bd}\right)}}{8\,\sqrt{bd}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))*x^2,x, algorithm="maxima")
```

```
[Out] 1/8*(sqrt(pi)*(2*b*d*x + b*c + a*d)*(b*c + a*d)^2*(erf(1/2*sqrt(-(2*b*d*x +
 b*c + a*d)^2/(b*d))) - 1)/((b*d)^(5/2)*sqrt(-(2*b*d*x + b*c + a*d)^2/(b*d)
)) - 4*(b*c + a*d)*b*d*e^(1/4*(2*b*d*x + b*c + a*d)^2/(b*d))/(b*d)^(5/2) -
4*(2*b*d*x + b*c + a*d)^3*gamma(3/2, -1/4*(2*b*d*x + b*c + a*d)^2/(b*d))/((
b*d)^(5/2)*(-(2*b*d*x + b*c + a*d)^2/(b*d))^(3/2)))*e^(a*c - 1/4*(b*c + a*d
)^2/(b*d))/sqrt(b*d)
```

Fricas [A]
time = 0.37, size = 148, normalized size = 0.69

$$-\frac{\sqrt{\pi}\left(b^{2}c^{2}+a^{2}d^{2}+2\left(abc-b\right)d\right)\sqrt{-bd}\,\operatorname{erf}\left(\frac{\left(2\,bdx+bc+ad\right)\sqrt{-bd}}{2\,bd}\right)e^{\left(-\frac{b^{2}c^{2}-2\,abcd+a^{2}d^{2}}{4\,bd}\right)}-2\left(2\,b^{2}d^{2}x-b^{2}cd-abd^{2}\right)e^{\left(bdx^{2}+ac+\left(bc+ad\right)x\right)}}{8\,b^{3}d^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))*x^2,x, algorithm="fricas")
```

```
[Out] -1/8*(sqrt(pi)*(b^2*c^2 + a^2*d^2 + 2*(a*b*c - b)*d)*sqrt(-b*d)*erf(1/2*(2*
b*d*x + b*c + a*d)*sqrt(-b*d)/(b*d))*e^(-1/4*(b^2*c^2 - 2*a*b*c*d + a^2*d^2
)/(b*d)) - 2*(2*b^2*d^2*x - b^2*c*d - a*b*d^2)*e^(b*d*x^2 + a*c + (b*c + a*
d)*x))/(b^3*d^3)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$e^{ac}\int x^{2}e^{adx}e^{bcx}e^{bdx^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))*x**2,x)
```

```
[Out] exp(a*c)*Integral(x**2*exp(a*d*x)*exp(b*c*x)*exp(b*d*x**2), x)
```

Giac [A]
time = 2.63, size = 152, normalized size = 0.70

$$-\frac{\frac{\sqrt{\pi}\left(b^{2}c^{2}+2\,abcd+a^{2}d^{2}-2\,bd\right)\operatorname{erf}\left(-\frac{1}{2}\sqrt{-bd}\left(2\,x+\frac{bc+ad}{bd}\right)\right)e^{\left(-\frac{b^{2}c^{2}-2\,abcd+a^{2}d^{2}}{4\,bd}\right)}}{\sqrt{-bd}}-2\left(bd\left(2\,x+\frac{bc+ad}{bd}\right)-2\,bc-2\,ad\right)e^{\left(bdx^{2}+bcx+adx+ac\right)}}{8\,b^{2}d^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))*x^2,x, algorithm="giac")
```

```
[Out] -1/8*(sqrt(pi)*(b^2*c^2 + 2*a*b*c*d + a^2*d^2 - 2*b*d)*erf(-1/2*sqrt(-b*d)*
(2*x + (b*c + a*d)/(b*d)))*e^(-1/4*(b^2*c^2 - 2*a*b*c*d + a^2*d^2)/(b*d))/s
qrt(-b*d) - 2*(b*d*(2*x + (b*c + a*d)/(b*d)) - 2*b*c - 2*a*d)*e^(b*d*x^2 +
b*c*x + a*d*x + a*c))/(b^2*d^2)
```

Mupad [B]
time = 0.30, size = 150, normalized size = 0.69

$$\frac{x\,\mathrm{e}^{a\,c+a\,d\,x+b\,c\,x+b\,d\,x^{2}}}{2\,b\,d}-\frac{\mathrm{e}^{a\,c+a\,d\,x+b\,c\,x+b\,d\,x^{2}}\left(\frac{a\,d}{4}+\frac{b\,c}{4}\right)}{b^{2}\,d^{2}}+\frac{\sqrt{\pi}\,\mathrm{e}^{\frac{a\,c}{2}-\frac{a^{2}\,d}{4\,b}-\frac{b\,c^{2}}{4\,d}}\,\mathrm{erfi}\left(\frac{\frac{a\,d}{2}+\frac{b\,c}{2}+b\,d\,x}{\sqrt{b\,d}}\right)\left(a^{2}\,d^{2}+2\,a\,b\,c\,d+b^{2}\,c^{2}-2\,b\,d\right)}{8\,b^{2}\,d^{2}\,\sqrt{b\,d}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*exp((a + b*x)*(c + d*x)),x)
```

```
[Out] (x*exp(a*c + a*d*x + b*c*x + b*d*x^2))/(2*b*d) - (exp(a*c + a*d*x + b*c*x +
 b*d*x^2)*((a*d)/4 + (b*c)/4))/(b^2*d^2) + (pi^(1/2)*exp((a*c)/2 - (a^2*d)/
(4*b) - (b*c^2)/(4*d))*erfi(((a*d)/2 + (b*c)/2 + b*d*x)/(b*d)^(1/2))*(a^2*d
^2 - 2*b*d + b^2*c^2 + 2*a*b*c*d))/(8*b^2*d^2*(b*d)^(1/2))
```

3.440 $\int e^{(a+bx)(c+dx)}x\,dx$

Optimal. Leaf size=107

$$\frac{e^{ac+(bc+ad)x+bdx^2}}{2bd}-\frac{(bc+ad)e^{-\frac{(bc-ad)^2}{4bd}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{bc+ad+2bdx}{2\sqrt{b}\,\sqrt{d}}\right)}{4b^{3/2}d^{3/2}}$$

```
[Out] 1/2*exp(a*c+(a*d+b*c)*x+b*d*x^2)/b/d-1/4*(a*d+b*c)*erfi(1/2*(2*b*d*x+a*d+b*
c)/b^(1/2)/d^(1/2))*Pi^(1/2)/b^(3/2)/d^(3/2)/exp(1/4*(-a*d+b*c)^2/b/d)
```

Rubi [A]

time = 0.08, antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$, Rules used = {2276, 2272, 2266, 2235}

$$\frac{e^{x(ad+bc)+ac+bdx^2}}{2bd}-\frac{\sqrt{\pi}\,(ad+bc)e^{-\frac{(bc-ad)^2}{4bd}}\,\mathrm{Erfi}\left(\frac{ad+bc+2bdx}{2\sqrt{b}\,\sqrt{d}}\right)}{4b^{3/2}d^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[E^((a + b*x)*(c + d*x))*x,x]
```

```
[Out] E^(a*c + (b*c + a*d)*x + b*d*x^2)/(2*b*d) - ((b*c + a*d)*Sqrt[Pi]*Erfi[(b*c
 + a*d + 2*b*d*x)/(2*Sqrt[b]*Sqrt[d])])/(4*b^(3/2)*d^(3/2)*E^((b*c - a*d)^2
/(4*b*d)))
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2272

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[e*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] - Dist[(b*e - 2*c*d)/(2*
c), Int[F^(a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[
b*e - 2*c*d, 0]
```

Rule 2276

```
Int[(F_)^(v_)*(u_)^(m_.), x_Symbol] :> Int[ExpandToSum[u, x]^m*F^ExpandToSu
m[v, x], x] /; FreeQ[{F, m}, x] && LinearQ[u, x] && QuadraticQ[v, x] &&  !(
LinearMatchQ[u, x] && QuadraticMatchQ[v, x])
```

Rubi steps

$$\begin{aligned}\int e^{(a+bx)(c+dx)}x\,dx &= \int e^{ac+(bc+ad)x+bdx^2}x\,dx\\ &= \frac{e^{ac+(bc+ad)x+bdx^2}}{2bd}-\frac{(bc+ad)\int e^{ac+(bc+ad)x+bdx^2}\,dx}{2bd}\\ &= \frac{e^{ac+(bc+ad)x+bdx^2}}{2bd}-\frac{\left((bc+ad)e^{-\frac{(bc-ad)^2}{4bd}}\right)\int e^{\frac{(bc+ad+2bdx)^2}{4bd}}\,dx}{2bd}\\ &= \frac{e^{ac+(bc+ad)x+bdx^2}}{2bd}-\frac{(bc+ad)e^{-\frac{(bc-ad)^2}{4bd}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{bc+ad+2bdx}{2\sqrt{b}\sqrt{d}}\right)}{4b^{3/2}d^{3/2}}\end{aligned}$$

Mathematica [A]
time = 0.16, size = 116, normalized size = 1.08

$$\frac{e^{-\frac{(bc-ad)^2}{4bd}}\left(2\sqrt{b}\sqrt{d}\,e^{\frac{(ad+b(c+2dx))^2}{4bd}}-(bc+ad)\sqrt{\pi}\,\mathrm{erfi}\left(\frac{ad+b(c+2dx)}{2\sqrt{b}\sqrt{d}}\right)\right)}{4b^{3/2}d^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^((a + b*x)*(c + d*x))*x,x]
[Out] (2*Sqrt[b]*Sqrt[d]*E^((a*d + b*(c + 2*d*x))^2/(4*b*d)) - (b*c + a*d)*Sqrt[P
i]*Erfi[(a*d + b*(c + 2*d*x))/(2*Sqrt[b]*Sqrt[d])])/(4*b^(3/2)*d^(3/2)*E^((
b*c - a*d)^2/(4*b*d)))
```

Maple [A]
time = 0.02, size = 102, normalized size = 0.95

method	result	si
default	$\frac{e^{ca+(ad+cb)x+bd\,x^2}}{2bd}+\frac{(ad+cb)\sqrt{\pi}\,e^{ca-\frac{(ad+cb)^2}{4bd}}\,\mathrm{erf}\left(-\sqrt{-bd}\,x+\frac{ad+cb}{2\sqrt{-bd}}\right)}{4bd\sqrt{-bd}}$	1
risch	$\frac{e^{(bx+a)(dx+c)}}{2bd}+\frac{\sqrt{\pi}\,e^{-\frac{(ad-cb)^2}{4bd}}\,\mathrm{erf}\left(-\sqrt{-bd}\,x+\frac{ad+cb}{2\sqrt{-bd}}\right)a}{4b\sqrt{-bd}}+\frac{\sqrt{\pi}\,e^{-\frac{(ad-cb)^2}{4bd}}\,\mathrm{erf}\left(-\sqrt{-bd}\,x+\frac{ad+cb}{2\sqrt{-bd}}\right)c}{4d\sqrt{-bd}}$	1

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((b*x+a)*(d*x+c))*x,x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*exp(c*a+(a*d+b*c)*x+b*d*x^2)/b/d+1/4*(a*d+b*c)/b/d*Pi^(1/2)*exp(c*a-1/4
*(a*d+b*c)^2/b/d)/(-b*d)^(1/2)*erf(-(-b*d)^(1/2)*x+1/2*(a*d+b*c)/(-b*d)^(1/
2))
```

Maxima [A]
time = 0.35, size = 143, normalized size = 1.34

$$-\frac{\left(\frac{\sqrt{\pi}\,(2\,bdx+bc+ad)(bc+ad)\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2\,bdx+bc+ad)^2}{bd}}\right)-1\right)}{(bd)^{\frac{3}{2}}\sqrt{-\frac{(2\,bdx+bc+ad)^2}{bd}}}-\frac{2\,bde^{\left(\frac{(2\,bdx+bc+ad)^2}{4\,bd}\right)}}{(bd)^{\frac{3}{2}}}\right)e^{\left(ac-\frac{(bc+ad)^2}{4\,bd}\right)}}{4\sqrt{bd}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))*x,x, algorithm="maxima")
```

```
[Out] -1/4*(sqrt(pi)*(2*b*d*x + b*c + a*d)*(b*c + a*d)*(erf(1/2*sqrt(-(2*b*d*x +
b*c + a*d)^2/(b*d))) - 1)/((b*d)^(3/2)*sqrt(-(2*b*d*x + b*c + a*d)^2/(b*d))
) - 2*b*d*e^(1/4*(2*b*d*x + b*c + a*d)^2/(b*d))/(b*d)^(3/2))*e^(a*c - 1/4*(
b*c + a*d)^2/(b*d))/sqrt(b*d)
```

Fricas [A]
time = 0.37, size = 107, normalized size = 1.00

$$\frac{\sqrt{\pi}\,(bc+ad)\sqrt{-bd}\ \operatorname{erf}\left(\frac{(2\,bdx+bc+ad)\sqrt{-bd}}{2\,bd}\right)e^{\left(-\frac{b^2c^2-2\,abcd+a^2d^2}{4\,bd}\right)}+2\,bde^{(bdx^2+ac+(bc+ad)x)}}{4\,b^2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))*x,x, algorithm="fricas")
```

```
[Out] 1/4*(sqrt(pi)*(b*c + a*d)*sqrt(-b*d)*erf(1/2*(2*b*d*x + b*c + a*d)*sqrt(-b*
d)/(b*d))*e^(-1/4*(b^2*c^2 - 2*a*b*c*d + a^2*d^2)/(b*d)) + 2*b*d*e^(b*d*x^2
 + a*c + (b*c + a*d)*x))/(b^2*d^2)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$e^{ac}\int xe^{adx}e^{bcx}e^{bdx^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))*x,x)
```

```
[Out] exp(a*c)*Integral(x*exp(a*d*x)*exp(b*c*x)*exp(b*d*x**2), x)
```

Giac [A]
time = 2.62, size = 104, normalized size = 0.97

$$\frac{\frac{\sqrt{\pi}\,(bc+ad)\,\operatorname{erf}\left(-\frac{1}{2}\,\sqrt{-bd}\,\left(2\,x+\frac{bc+ad}{bd}\right)\right)e^{\left(-\frac{b^2c^2-2\,abcd+a^2d^2}{4\,bd}\right)}}{\sqrt{-bd}}+2\,e^{\left(bdx^2+bcx+adx+ac\right)}}{4\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))*x,x, algorithm="giac")
```

```
[Out] 1/4*(sqrt(pi)*(b*c + a*d)*erf(-1/2*sqrt(-b*d)*(2*x + (b*c + a*d)/(b*d)))*e^
(-1/4*(b^2*c^2 - 2*a*b*c*d + a^2*d^2)/(b*d))/sqrt(-b*d) + 2*e^(b*d*x^2 + b*
c*x + a*d*x + a*c))/(b*d)
```

Mupad [B]
time = 3.67, size = 95, normalized size = 0.89

$$\frac{\mathrm{e}^{a\,c+a\,d\,x+b\,c\,x+b\,d\,x^2}}{2\,b\,d}-\frac{\sqrt{\pi}\,\mathrm{e}^{\frac{a\,c}{2}-\frac{a^2\,d}{4\,b}-\frac{b\,c^2}{4\,d}}\,\mathrm{erfi}\left(\frac{\frac{a\,d}{2}+\frac{b\,c}{2}+b\,d\,x}{\sqrt{b\,d}}\right)\,\left(a\,d+b\,c\right)}{4\,b\,d\,\sqrt{b\,d}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*exp((a + b*x)*(c + d*x)),x)
```

```
[Out] exp(a*c + a*d*x + b*c*x + b*d*x^2)/(2*b*d) - (pi^(1/2)*exp((a*c)/2 - (a^2*d
)/(4*b) - (b*c^2)/(4*d))*erfi(((a*d)/2 + (b*c)/2 + b*d*x)/(b*d)^(1/2))*(a*d
 + b*c))/(4*b*d*(b*d)^(1/2))
```

3.441 $\int e^{(a+bx)(c+dx)}\,dx$

Optimal. Leaf size=68

$$\frac{e^{-\frac{(bc-ad)^2}{4bd}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{bc+ad+2bdx}{2\sqrt{b}\,\sqrt{d}}\right)}{2\sqrt{b}\,\sqrt{d}}$$

```
[Out] 1/2*erfi(1/2*(2*b*d*x+a*d+b*c)/b^(1/2)/d^(1/2))*Pi^(1/2)/exp(1/4*(-a*d+b*c)
^2/b/d)/b^(1/2)/d^(1/2)
```

Rubi [A]
time = 0.02, antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$, Rules used = {2267, 2266, 2235}

$$\frac{\sqrt{\pi}\,e^{-\frac{(bc-ad)^2}{4bd}}\,\mathrm{Erfi}\left(\frac{ad+bc+2bdx}{2\sqrt{b}\,\sqrt{d}}\right)}{2\sqrt{b}\,\sqrt{d}}$$

Antiderivative was successfully verified.

```
[In] Int[E^((a + b*x)*(c + d*x)),x]
```

```
[Out] (Sqrt[Pi]*Erfi[(b*c + a*d + 2*b*d*x)/(2*Sqrt[b]*Sqrt[d])])/(2*Sqrt[b]*Sqrt[
d]*E^((b*c - a*d)^2/(4*b*d)))
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2267

```
Int[(F_)^(v_), x_Symbol] :> Int[F^ExpandToSum[v, x], x] /; FreeQ[F, x] && Q
uadraticQ[v, x] &&  !QuadraticMatchQ[v, x]
```

Rubi steps

$$\int e^{(a+bx)(c+dx)}\,dx = \int e^{ac+(bc+ad)x+bdx^2}\,dx$$
$$= e^{-\frac{(bc-ad)^2}{4bd}} \int e^{\frac{(bc+ad+2bdx)^2}{4bd}}\,dx$$
$$= \frac{e^{-\frac{(bc-ad)^2}{4bd}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{bc+ad+2bdx}{2\sqrt{b}\sqrt{d}}\right)}{2\sqrt{b}\sqrt{d}}$$

Mathematica [A]
time = 0.02, size = 68, normalized size = 1.00

$$\frac{e^{-\frac{(bc-ad)^2}{4bd}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{ad+b(c+2dx)}{2\sqrt{b}\sqrt{d}}\right)}{2\sqrt{b}\sqrt{d}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^((a + b*x)*(c + d*x)),x]
[Out] (Sqrt[Pi]*Erfi[(a*d + b*(c + 2*d*x))/(2*Sqrt[b]*Sqrt[d])])/(2*Sqrt[b]*Sqrt[
d]*E^((b*c - a*d)^2/(4*b*d)))
```

Maple [A]
time = 0.02, size = 60, normalized size = 0.88

method	result	size
risch	$-\frac{\sqrt{\pi}\,\mathrm{e}^{-\frac{(ad-cb)^2}{4bd}}\,\mathrm{erf}\left(-\sqrt{-bd}\,x+\frac{ad+cb}{2\sqrt{-bd}}\right)}{2\sqrt{-bd}}$	57
default	$-\frac{\sqrt{\pi}\,\mathrm{e}^{ca-\frac{(ad+cb)^2}{4bd}}\,\mathrm{erf}\left(-\sqrt{-bd}\,x+\frac{ad+cb}{2\sqrt{-bd}}\right)}{2\sqrt{-bd}}$	60

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((b*x+a)*(d*x+c)),x,method=_RETURNVERBOSE)
[Out] -1/2*Pi^(1/2)*exp(c*a-1/4*(a*d+b*c)^2/b/d)/(-b*d)^(1/2)*erf(-(-b*d)^(1/2)*x
+1/2*(a*d+b*c)/(-b*d)^(1/2))
```

Maxima [A]
time = 0.29, size = 58, normalized size = 0.85

$$\frac{\sqrt{\pi}\,\mathrm{erf}\left(\sqrt{-bd}\,x - \frac{bc+ad}{2\sqrt{-bd}}\right)e^{\left(ac-\frac{(bc+ad)^2}{4\,bd}\right)}}{2\sqrt{-bd}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(pi)*erf(sqrt(-b*d)*x - 1/2*(b*c + a*d)/sqrt(-b*d))*e^(a*c - 1/4*(b
*c + a*d)^2/(b*d))/sqrt(-b*d)
```

Fricas [A]
time = 0.35, size = 74, normalized size = 1.09

$$-\frac{\sqrt{\pi}\,\sqrt{-bd}\,\operatorname{erf}\left(\frac{(2\,bdx+bc+ad)\sqrt{-bd}}{2\,bd}\right)e^{\left(-\frac{b^2c^2-2\,abcd+a^2d^2}{4\,bd}\right)}}{2\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c)),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b*d)*erf(1/2*(2*b*d*x + b*c + a*d)*sqrt(-b*d)/(b*d))*e^
(-1/4*(b^2*c^2 - 2*a*b*c*d + a^2*d^2)/(b*d))/(b*d)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$e^{ac}\int e^{adx}e^{bcx}e^{bdx^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c)),x)
```

```
[Out] exp(a*c)*Integral(exp(a*d*x)*exp(b*c*x)*exp(b*d*x**2), x)
```

Giac [A]
time = 2.15, size = 68, normalized size = 1.00

$$-\frac{\sqrt{\pi}\,\operatorname{erf}\left(-\frac{1}{2}\,\sqrt{-bd}\,\left(2\,x+\frac{bc+ad}{bd}\right)\right)e^{\left(-\frac{b^2c^2-2\,abcd+a^2d^2}{4\,bd}\right)}}{2\,\sqrt{-bd}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*erf(-1/2*sqrt(-b*d)*(2*x + (b*c + a*d)/(b*d)))*e^(-1/4*(b^2*c
^2 - 2*a*b*c*d + a^2*d^2)/(b*d))/sqrt(-b*d)
```

Mupad [B]
time = 0.04, size = 60, normalized size = 0.88

$$-\frac{\sqrt{\pi}\,\mathrm{e}^{\frac{a\,c}{2}-\frac{a^2\,d}{4\,b}-\frac{b\,c^2}{4\,d}}\,\operatorname{erf}\left(\frac{a\,d\,1\mathrm{i}+b\,c\,1\mathrm{i}+b\,d\,x\,2\mathrm{i}}{2\,\sqrt{b\,d}}\right)\,1\mathrm{i}}{2\,\sqrt{b\,d}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((a + b*x)*(c + d*x)),x)
```

```
[Out] -(pi^(1/2)*exp((a*c)/2 - (a^2*d)/(4*b) - (b*c^2)/(4*d))*erf((a*d*1i + b*c*1
i + b*d*x*2i)/(2*(b*d)^(1/2)))*1i)/(2*(b*d)^(1/2))
```

3.442 $\int \frac{e^{(a+bx)(c+dx)}}{x}\,dx$

Optimal. Leaf size=28

$$\operatorname{Int}\left(\frac{e^{ac+(bc+ad)x+bdx^2}}{x},x\right)$$

```
[Out] Unintegrable(exp(a*c+(a*d+b*c)*x+b*d*x^2)/x,x)
```

Rubi [A]
time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{e^{(a+bx)(c+dx)}}{x}\,dx$$

Verification is not applicable to the result.

```
[In] Int[E^((a + b*x)*(c + d*x))/x,x]
[Out] Defer[Int][E^(a*c + (b*c + a*d)*x + b*d*x^2)/x, x]
```

Rubi steps

$$\int \frac{e^{(a+bx)(c+dx)}}{x}\,dx = \int \frac{e^{ac+(bc+ad)x+bdx^2}}{x}\,dx$$

Mathematica [A]
time = 0.49, size = 0, normalized size = 0.00

$$\int \frac{e^{(a+bx)(c+dx)}}{x}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[E^((a + b*x)*(c + d*x))/x,x]
[Out] Integrate[E^((a + b*x)*(c + d*x))/x, x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{e}^{(bx+a)(dx+c)}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((b*x+a)*(d*x+c))/x,x)
[Out] int(exp((b*x+a)*(d*x+c))/x,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))/x,x, algorithm="maxima")
[Out] integrate(e^((b*x + a)*(d*x + c))/x, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))/x,x, algorithm="fricas")
[Out] integral(e^(b*d*x^2 + a*c + (b*c + a*d)*x)/x, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$e^{ac}\int\frac{e^{adx}e^{bcx}e^{bdx^2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))/x,x)
[Out] exp(a*c)*Integral(exp(a*d*x)*exp(b*c*x)*exp(b*d*x**2)/x, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))/x,x, algorithm="giac")
[Out] integrate(e^((b*x + a)*(d*x + c))/x, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int\frac{\mathrm{e}^{(a+b\,x)\,(c+d\,x)}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((a + b*x)*(c + d*x))/x,x)
[Out] int(exp((a + b*x)*(c + d*x))/x, x)
```

3.443 $\int \frac{e^{(a+bx)(c+dx)}}{x^2}\,dx$

Optimal. Leaf size=128

$$-\frac{e^{ac+(bc+ad)x+bdx^2}}{x}+\sqrt{b}\,\sqrt{d}\,e^{-\frac{(bc-ad)^2}{4bd}}\sqrt{\pi}\,\text{erfi}\left(\frac{bc+ad+2bdx}{2\sqrt{b}\,\sqrt{d}}\right)+(bc+ad)\text{Int}\left(\frac{e^{ac+(bc+ad)x+bdx^2}}{x},x\right)$$

```
[Out] -exp(a*c+(a*d+b*c)*x+b*d*x^2)/x+erfi(1/2*(2*b*d*x+a*d+b*c)/b^(1/2)/d^(1/2))
*b^(1/2)*d^(1/2)*Pi^(1/2)/exp(1/4*(-a*d+b*c)^2/b/d)+(a*d+b*c)*Unintegrable(
exp(a*c+(a*d+b*c)*x+b*d*x^2)/x,x)
```

Rubi [A]
time = 0.19, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{e^{(a+bx)(c+dx)}}{x^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[E^((a + b*x)*(c + d*x))/x^2,x]
```

```
[Out] -(E^(a*c + (b*c + a*d)*x + b*d*x^2)/x) + (Sqrt[b]*Sqrt[d]*Sqrt[Pi]*Erfi[(b*
c + a*d + 2*b*d*x)/(2*Sqrt[b]*Sqrt[d])])/E^((b*c - a*d)^2/(4*b*d)) + (b*c +
 a*d)*Defer[Int][E^(a*c + (b*c + a*d)*x + b*d*x^2)/x, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{e^{(a+bx)(c+dx)}}{x^2}\,dx &= \int \frac{e^{ac+(bc+ad)x+bdx^2}}{x^2}\,dx\\
&= -\frac{e^{ac+(bc+ad)x+bdx^2}}{x}+(2bd)\int e^{ac+(bc+ad)x+bdx^2}\,dx-(-bc-ad)\int \frac{e^{ac+(bc+ad)x+bdx^2}}{x}\,dx\\
&= -\frac{e^{ac+(bc+ad)x+bdx^2}}{x}-(-bc-ad)\int \frac{e^{ac+(bc+ad)x+bdx^2}}{x}\,dx+\left(2bde^{-\frac{(bc-ad)^2}{4bd}}\right)\int e^{\frac{(bc+ad+2bdx)^2}{4bd}}\\
&= -\frac{e^{ac+(bc+ad)x+bdx^2}}{x}+\sqrt{b}\,\sqrt{d}\,e^{-\frac{(bc-ad)^2}{4bd}}\sqrt{\pi}\,\text{erfi}\left(\frac{bc+ad+2bdx}{2\sqrt{b}\,\sqrt{d}}\right)-(-bc-ad)\int \frac{e^{ac+(b}}{}
\end{aligned}$$

Mathematica [A]
time = 0.68, size = 0, normalized size = 0.00

$$\int \frac{e^{(a+bx)(c+dx)}}{x^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[E^((a + b*x)*(c + d*x))/x^2,x]
```

```
[Out] Integrate[E^((a + b*x)*(c + d*x))/x^2, x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{e}^{(bx+a)(dx+c)}}{x^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((b*x+a)*(d*x+c))/x^2,x)
```

```
[Out] int(exp((b*x+a)*(d*x+c))/x^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))/x^2,x, algorithm="maxima")
```

```
[Out] integrate(e^((b*x + a)*(d*x + c))/x^2, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))/x^2,x, algorithm="fricas")
```

```
[Out] integral(e^(b*d*x^2 + a*c + (b*c + a*d)*x)/x^2, x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$e^{ac} \int \frac{e^{adx} e^{bcx} e^{bdx^{2}}}{x^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))/x**2,x)
```

```
[Out] exp(a*c)*Integral(exp(a*d*x)*exp(b*c*x)*exp(b*d*x**2)/x**2, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))/x^2,x, algorithm="giac")
```

```
[Out] integrate(e^((b*x + a)*(d*x + c))/x^2, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{e}^{(a+b\,x)\,(c+d\,x)}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((a + b*x)*(c + d*x))/x^2,x)
```

```
[Out] int(exp((a + b*x)*(c + d*x))/x^2, x)
```

3.444 $\int f^{a+bx+cx^2}(d+ex)^3\,dx$

Optimal. Leaf size=266

$$-\frac{e^3f^{a+bx+cx^2}}{2c^2\log^2(f)}-\frac{3e^2(2cd-be)f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{8c^{5/2}\log^{\frac{3}{2}}(f)}+\frac{e(2cd-be)^2f^{a+bx+cx^2}}{8c^3\log(f)}+\frac{e(2cd-be)f^{a+bx+c}}{4c^2\log(f}$$

```
[Out] -1/2*e^3*f^(c*x^2+b*x+a)/c^2/ln(f)^2+1/8*e*(-b*e+2*c*d)^2*f^(c*x^2+b*x+a)/c
^3/ln(f)+1/4*e*(-b*e+2*c*d)*f^(c*x^2+b*x+a)*(e*x+d)/c^2/ln(f)+1/2*e*f^(c*x^
2+b*x+a)*(e*x+d)^2/c/ln(f)-3/8*e^2*(-b*e+2*c*d)*f^(a-1/4*b^2/c)*erfi(1/2*(2
*c*x+b)*ln(f)^(1/2)/c^(1/2))*Pi^(1/2)/c^(5/2)/ln(f)^(3/2)+1/16*(-b*e+2*c*d)
^3*f^(a-1/4*b^2/c)*erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c^(1/2))*Pi^(1/2)/c^(7/2)
/ln(f)^(1/2)
```

Rubi [A]
time = 0.25, antiderivative size = 266, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2273, 2272, 2266, 2235}

$$-\frac{3\sqrt{\pi}\,e^2f^{a-\frac{b^2}{4c}}(2cd-be)\mathrm{Erfi}\left(\frac{\sqrt{\log(f)}(b+2cx)}{2\sqrt{c}}\right)}{8c^{5/2}\log^{\frac{3}{2}}(f)}+\frac{\sqrt{\pi}\,f^{a-\frac{b^2}{4c}}(2cd-be)^3\mathrm{Erfi}\left(\frac{\sqrt{\log(f)}(b+2cx)}{2\sqrt{c}}\right)}{16c^{7/2}\sqrt{\log(f)}}+\frac{e(2cd-be)^2f^{a+bx+cx^2}}{8c^3\log(f)}+\frac{e(d+ex)(2cd-be)f^{a+bx+cx^2}}{4c^2\log(f)}-\frac{e^3f^{a+bx+cx^2}}{2c^2\log^2(f)}+\frac{e(d+ex)^2f^{a+bx+cx^2}}{2c\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)*(d + e*x)^3,x]
```

```
[Out] -1/2*(e^3*f^(a + b*x + c*x^2))/(c^2*Log[f]^2) - (3*e^2*(2*c*d - b*e)*f^(a -
 b^2/(4*c))*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/(8*c^(5/
2)*Log[f]^(3/2)) + (e*(2*c*d - b*e)^2*f^(a + b*x + c*x^2))/(8*c^3*Log[f]) +
 (e*(2*c*d - b*e)*f^(a + b*x + c*x^2)*(d + e*x))/(4*c^2*Log[f]) + (e*f^(a +
 b*x + c*x^2)*(d + e*x)^2)/(2*c*Log[f]) + ((2*c*d - b*e)^3*f^(a - b^2/(4*c)
)*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/(16*c^(7/2)*Sqrt[L
og[f]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2272

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[e*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] - Dist[(b*e - 2*c*d)/(2*
c), Int[F^(a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[
b*e - 2*c*d, 0]
```

Rule 2273

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[e*(d + e*x)^(m - 1)*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] +
 (-Dist[(b*e - 2*c*d)/(2*c), Int[(d + e*x)^(m - 1)*F^(a + b*x + c*x^2), x],
 x] - Dist[(m - 1)*(e^2/(2*c*Log[F])), Int[(d + e*x)^(m - 2)*F^(a + b*x + c
*x^2), x], x]) /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[b*e - 2*c*d, 0] && Gt
Q[m, 1]
```

Rubi steps

$$\begin{aligned}\int f^{a+bx+cx^2}(d+ex)^3\,dx &= \frac{ef^{a+bx+cx^2}(d+ex)^2}{2c\log(f)}-\frac{(-2cd+be)\int f^{a+bx+cx^2}(d+ex)^2\,dx}{2c}-\frac{e^2\int f^{a+bx+cx^2}(d+\\ &= -\frac{e^3f^{a+bx+cx^2}}{2c^2\log^2(f)}+\frac{e(2cd-be)f^{a+bx+cx^2}(d+ex)}{4c^2\log(f)}+\frac{ef^{a+bx+cx^2}(d+ex)^2}{2c\log(f)}+\frac{(2cd-be\\ &= -\frac{e^3f^{a+bx+cx^2}}{2c^2\log^2(f)}+\frac{e(2cd-be)^2f^{a+bx+cx^2}}{8c^3\log(f)}+\frac{e(2cd-be)f^{a+bx+cx^2}(d+ex)}{4c^2\log(f)}+\frac{ef^{a+bx-}{2\\ &= -\frac{e^3f^{a+bx+cx^2}}{2c^2\log^2(f)}-\frac{3e^2(2cd-be)f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{8c^{5/2}\log^{\frac{3}{2}}(f)}+\frac{e(2cd-be)^2f^{a}}{8c^3\log(f\\ &= -\frac{e^3f^{a+bx+cx^2}}{2c^2\log^2(f)}-\frac{3e^2(2cd-be)f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{8c^{5/2}\log^{\frac{3}{2}}(f)}+\frac{e(2cd-be)^2f^{a}}{8c^3\log(f\end{aligned}$$

Mathematica [A]
time = 0.46, size = 169, normalized size = 0.64

$$\frac{f^{a-\frac{b^2}{4c}}\left((2cd-be)\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)\sqrt{\log(f)}\,(-6ce^2+(-2cd+be)^2\log(f))+2\sqrt{c}\,ef^{\frac{(b+2cx)^2}{4c}}(-4ce^2+(b^2e^2-2bce(3d+ex)+4c^2(3d^2+3dex+e^2x^2))\log(f))\right)}{16c^{7/2}\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)*(d + e*x)^3,x]
```

```
[Out] (f^(a - b^2/(4*c))*((2*c*d - b*e)*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/
(2*Sqrt[c])]*Sqrt[Log[f]]*(-6*c*e^2 + (-2*c*d + b*e)^2*Log[f]) + 2*Sqrt[c]*
```

```
e*f^((b + 2*c*x)^2/(4*c))*(-4*c*e^2 + (b^2*e^2 - 2*b*c*e*(3*d + e*x) + 4*c^
2*(3*d^2 + 3*d*e*x + e^2*x^2))*Log[f])))/(16*c^(7/2)*Log[f]^2)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 549 vs. $2(226) = 452$.
time = 0.10, size = 550, normalized size = 2.07

method	result
risch	$-\frac{d^{3}\sqrt{\pi}\, f^{a} f^{-\frac{b^{2}}{4c}} \operatorname{erf}\left(-\sqrt{-c\ln\left(f\right)}\, x+\frac{b\ln\left(f\right)}{2\sqrt{-c\ln\left(f\right)}}\right)}{2\sqrt{-c\ln\left(f\right)}}+\frac{e^{3}x^{2}f^{c\,x^{2}}f^{bx}f^{a}}{2c\ln\left(f\right)}-\frac{e^{3}bx\,f^{c\,x^{2}}f^{bx}f^{a}}{4c^{2}\ln\left(f\right)}+\frac{e^{3}b^{2}f^{c\,x^{2}}f^{bx}f^{a}}{8c^{3}\ln\left(f\right)}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)*(e*x+d)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*d^3*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(-(-c*ln(f))^(1/2)
*x+1/2*b*ln(f)/(-c*ln(f))^(1/2))+1/2*e^3/c/ln(f)*x^2*f^(c*x^2)*f^(b*x)*f^a-
1/4*e^3/c^2*b/ln(f)*x*f^(c*x^2)*f^(b*x)*f^a+1/8*e^3/c^3*b^2/ln(f)*f^(c*x^2)
*f^(b*x)*f^a+1/16*e^3/c^3*b^3*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*
erf(-(-c*ln(f))^(1/2)*x+1/2*b*ln(f)/(-c*ln(f))^(1/2))-3/8*e^3/c^2*b/ln(f)*P
i^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(-(-c*ln(f))^(1/2)*x+1/2*b*l
n(f)/(-c*ln(f))^(1/2))-1/2*e^3/c^2/ln(f)^2*f^(c*x^2)*f^(b*x)*f^a+3/2*d*e^2/
c/ln(f)*x*f^(c*x^2)*f^(b*x)*f^a-3/4*d*e^2/c^2*b/ln(f)*f^(c*x^2)*f^(b*x)*f^a
-3/8*d*e^2/c^2*b^2*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(-(-c*ln
(f))^(1/2)*x+1/2*b*ln(f)/(-c*ln(f))^(1/2))+3/4*d*e^2/c/ln(f)*Pi^(1/2)*f^a*f
^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(-(-c*ln(f))^(1/2)*x+1/2*b*ln(f)/(-c*ln(f
))^(1/2))+3/2*d^2*e/c/ln(f)*f^(c*x^2)*f^(b*x)*f^a+3/4*d^2*e*b/c*Pi^(1/2)*f^
a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(-(-c*ln(f))^(1/2)*x+1/2*b*ln(f)/(-c*l
n(f))^(1/2))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 539 vs. $2(226) = 452$.
time = 0.46, size = 539, normalized size = 2.03

$$-\frac{3\left(\frac{\sqrt{\pi}(2cx+b)b\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}\right)-1\right)\log(f)^2}{\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}\,(c\log(f))^{\frac{3}{2}}}-\frac{2cf^{\frac{(2cx+b)^2}{4c}}\log(f)}{(c\log(f))^{\frac{3}{2}}}\right)d^2ef^{a-\frac{b^2}{4c}}}{4\sqrt{c\log(f)}}+\frac{3\left(\frac{\sqrt{\pi}(2cx+b)b^2\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}\right)-1\right)\log(f)^3}{\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}\,(c\log(f))^{\frac{5}{2}}}-\frac{4(2cx+b)^3\Gamma\left(\frac{3}{2},-\frac{(2cx+b)^2\log(f)}{4c}\right)\log(f)^3}{\left(-\frac{(2cx+b)^2\log(f)}{c}\right)^{\frac{3}{2}}(c\log(f))^{\frac{5}{2}}}-\frac{4bcf^{\frac{(2cx+b)^2}{4c}}\log(f)^2}{(c\log(f))^{\frac{5}{2}}}\right)de^2f^{a-\frac{b^2}{4c}}}{8\sqrt{c\log(f)}}-\frac{\left(\frac{\sqrt{\pi}(2cx+b)b^3\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}\right)-1\right)\log(f)^4}{\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}\,(c\log(f))^{\frac{7}{2}}}-\frac{12(2cx+b)^3b\Gamma\left(\frac{3}{2},-\frac{(2cx+b)^2\log(f)}{4c}\right)\log(f)^4}{\left(-\frac{(2cx+b)^2\log(f)}{c}\right)^{\frac{3}{2}}(c\log(f))^{\frac{7}{2}}}-\frac{6b^2cf^{\frac{(2cx+b)^2}{4c}}\log(f)^3}{(c\log(f))^{\frac{7}{2}}}+\frac{8c^2\Gamma\left(2,-\frac{(2cx+b)^2\log(f)}{4c}\right)\log(f)^2}{(c\log(f))^{\frac{7}{2}}}\right)e^3f^{a-\frac{b^2}{4c}}}{16\sqrt{c\log(f)}}+\frac{\sqrt{\pi}d^3f^a\operatorname{erf}\left(\sqrt{-c\log(f)}\,x-\frac{b\log(f)}{2\sqrt{-c\log(f)}}\right)}{2\sqrt{-c\log(f)}\,f^{\frac{b^2}{4c}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] -3/4*(sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) - 1)*l
og(f)^2/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(3/2)) - 2*c*f^(1/4*(2*c*
x + b)^2/c)*log(f)/(c*log(f))^(3/2))*d^2*e*f^(a - 1/4*b^2/c)/sqrt(c*log(f))
 + 3/8*(sqrt(pi)*(2*c*x + b)*b^2*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) -
1)*log(f)^3/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(5/2)) - 4*(2*c*x + b
```

```
)^3*gamma(3/2, -1/4*(2*c*x + b)^2*log(f)/c)*log(f)^3/((-(2*c*x + b)^2*log(f
)/c)^(3/2)*(c*log(f))^(5/2)) - 4*b*c*f^(1/4*(2*c*x + b)^2/c)*log(f)^2/(c*lo
g(f))^(5/2))*d*e^2*f^(a - 1/4*b^2/c)/sqrt(c*log(f)) - 1/16*(sqrt(pi)*(2*c*x
 + b)*b^3*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) - 1)*log(f)^4/(sqrt(-(2*c
*x + b)^2*log(f)/c)*(c*log(f))^(7/2)) - 12*(2*c*x + b)^3*b*gamma(3/2, -1/4*
(2*c*x + b)^2*log(f)/c)*log(f)^4/((-(2*c*x + b)^2*log(f)/c)^(3/2)*(c*log(f)
)^(7/2)) - 6*b^2*c*f^(1/4*(2*c*x + b)^2/c)*log(f)^3/(c*log(f))^(7/2) + 8*c^
2*gamma(2, -1/4*(2*c*x + b)^2*log(f)/c)*log(f)^2/(c*log(f))^(7/2))*e^3*f^(a
 - 1/4*b^2/c)/sqrt(c*log(f)) + 1/2*sqrt(pi)*d^3*f^a*erf(sqrt(-c*log(f))*x -
 1/2*b*log(f)/sqrt(-c*log(f)))/(sqrt(-c*log(f))*f^(1/4*b^2/c))
```

Fricas [A]
time = 0.38, size = 193, normalized size = 0.73

$$-\frac{2\,{\left(4\,c^{2} e^{3} - {\left(12\,c^{3} d^{2} e + {\left(4\,c^{3} x^{2} - 2\,b c^{2} x + b^{2} c\right)} e^{3} + 6\,{\left(2\,c^{3} d x - b c^{2} d\right)} e^{2}\right)} \log\left(f\right)\right)} f^{c x^{2} + b x + a} - \frac{\sqrt{\pi} {\left(12\,c^{2} d e^{2} - 6\,b c e^{3} - {\left(8\,c^{3} d^{3} - 12\,b c^{2} d^{2} e + 6\,b^{2} c d e^{2} - b^{3} e^{3}\right)} \log\left(f\right)\right)} \sqrt{-c \log\left(f\right)} \operatorname{erf}\left(\frac{{\left(2\,c x + b\right)} \sqrt{-c \log\left(f\right)}}{2\,c}\right)}{f^{\frac{b^{2} - 4\,a c}{4\,c}}}}{16\,c^{4} \log\left(f\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] -1/16*(2*(4*c^2*e^3 - (12*c^3*d^2*e + (4*c^3*x^2 - 2*b*c^2*x + b^2*c)*e^3 +
 6*(2*c^3*d*x - b*c^2*d)*e^2)*log(f))*f^(c*x^2 + b*x + a) - sqrt(pi)*(12*c^
2*d*e^2 - 6*b*c*e^3 - (8*c^3*d^3 - 12*b*c^2*d^2*e + 6*b^2*c*d*e^2 - b^3*e^3
)*log(f))*sqrt(-c*log(f))*erf(1/2*(2*c*x + b)*sqrt(-c*log(f))/c)/f^(1/4*(b^
2 - 4*a*c)/c))/(c^4*log(f)^2)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx+cx^2}(d+ex)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)*(e*x+d)**3,x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)*(d + e*x)**3, x)
```

Giac [A]
time = 3.57, size = 401, normalized size = 1.51

$$-\frac{\sqrt{\pi} d^{3} \operatorname{erf}\left(-\frac{1}{2}\,\sqrt{-c \log\left(f\right)} {\left(2\,x + \frac{b}{c}\right)}\right) e^{\left(-\frac{b^{2} \log\left(f\right) - 4\,a c \log\left(f\right)}{4\,c}\right)}}{2\,\sqrt{-c \log\left(f\right)}} + \frac{3\,{\left(\frac{\sqrt{\pi} b d^{2} \operatorname{erf}\left(-\frac{1}{2}\,\sqrt{-c \log\left(f\right)} {\left(2\,x + \frac{b}{c}\right)}\right) e^{\left(-\frac{b^{2} \log\left(f\right) - 4\,a c \log\left(f\right) - 4\,c}{4\,c}\right)}}{\sqrt{-c \log\left(f\right)}} + \frac{2\,d^{2} e^{\left(c x^{2} \log\left(f\right) + b x \log\left(f\right) + a \log\left(f\right) + 1\right)}}{\log\left(f\right)}\right)}}{4\,c} - \frac{3\,{\left(\frac{\sqrt{\pi} {\left(b^{2} d \log\left(f\right) - 2\,c d\right)} \operatorname{erf}\left(-\frac{1}{2}\,\sqrt{-c \log\left(f\right)} {\left(2\,x + \frac{b}{c}\right)}\right) e^{\left(-\frac{b^{2} \log\left(f\right) - 4\,a c \log\left(f\right) - 8\,c}{4\,c}\right)}}{\sqrt{-c \log\left(f\right)} \log\left(f\right)} - \frac{2\,{\left(c d {\left(2\,x + \frac{b}{c}\right)} - 2\,b d\right)} e^{\left(c x^{2} \log\left(f\right) + b x \log\left(f\right) + a \log\left(f\right) + 2\right)}}{\log\left(f\right)}\right)}}{8\,c^{2}} + \frac{\frac{\sqrt{\pi} {\left(b^{3} \log\left(f\right) - 6\,b c\right)} \operatorname{erf}\left(-\frac{1}{2}\,\sqrt{-c \log\left(f\right)} {\left(2\,x + \frac{b}{c}\right)}\right) e^{\left(-\frac{b^{2} \log\left(f\right) - 4\,a c \log\left(f\right) - 12\,c}{4\,c}\right)}}{\sqrt{-c \log\left(f\right)} \log\left(f\right)} + \frac{2\,{\left(c^{2} {\left(2\,x + \frac{b}{c}\right)}^{2} \log\left(f\right) - 3\,b c {\left(2\,x + \frac{b}{c}\right)} \log\left(f\right) + 3\,b^{2} \log\left(f\right) - 4\,c\right)} e^{\left(c x^{2} \log\left(f\right) + b x \log\left(f\right) + a \log\left(f\right) + 3\right)}}{\log\left(f\right)^{2}}}{16\,c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(e*x+d)^3,x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*d^3*erf(-1/2*sqrt(-c*log(f))*(2*x + b/c))*e^(-1/4*(b^2*log(f)
 - 4*a*c*log(f))/c)/sqrt(-c*log(f)) + 3/4*(sqrt(pi)*b*d^2*erf(-1/2*sqrt(-c*
```

```
log(f))*(2*x + b/c))*e^(-1/4*(b^2*log(f) - 4*a*c*log(f) - 4*c)/c)/sqrt(-c*l
og(f)) + 2*d^2*e^(c*x^2*log(f) + b*x*log(f) + a*log(f) + 1)/log(f))/c - 3/8
*(sqrt(pi)*(b^2*d*log(f) - 2*c*d)*erf(-1/2*sqrt(-c*log(f))*(2*x + b/c))*e^(
-1/4*(b^2*log(f) - 4*a*c*log(f) - 8*c)/c)/(sqrt(-c*log(f))*log(f)) - 2*(c*d
*(2*x + b/c) - 2*b*d)*e^(c*x^2*log(f) + b*x*log(f) + a*log(f) + 2)/log(f))/
c^2 + 1/16*(sqrt(pi)*(b^3*log(f) - 6*b*c)*erf(-1/2*sqrt(-c*log(f))*(2*x + b
/c))*e^(-1/4*(b^2*log(f) - 4*a*c*log(f) - 12*c)/c)/(sqrt(-c*log(f))*log(f))
 + 2*(c^2*(2*x + b/c)^2*log(f) - 3*b*c*(2*x + b/c)*log(f) + 3*b^2*log(f) -
4*c)*e^(c*x^2*log(f) + b*x*log(f) + a*log(f) + 3)/log(f)^2)/c^3
```

Mupad [B]
time = 3.89, size = 251, normalized size = 0.94

$$\frac{e^3\,f^a\,f^{c\,x^2}\,f^{b\,x}\,x^2}{2\,c\,\ln\left(f\right)}-\frac{f^{a-\frac{b^2}{4\,c}}\,\sqrt{\pi }\,\mathrm{erfi}\left(\frac{\frac{b\,\ln(f)}{2}+c\,x\,\ln(f)}{\sqrt{c\,\ln\left(f\right)}}\right)\,\left(\frac{\ln(f)\,b^3\,e^3}{16}-\frac{3\,\ln(f)\,b^2\,c\,d\,e^2}{8}+\frac{3\,\ln(f)\,b\,c^2\,d^2\,e}{4}-\frac{3\,b\,c\,e^3}{8}-\frac{\ln(f)\,c^3\,d^3}{2}+\frac{3\,c^2\,d\,e^2}{4}\right)}{c^3\,\ln\left(f\right)\,\sqrt{c\,\ln\left(f\right)}}-\frac{f^a\,f^{c\,x^2}\,f^{b\,x}\,x\,\left(b\,e^3-6\,c\,d\,e^2\right)}{4\,c^2\,\ln\left(f\right)}-f^a\,f^{c\,x^2}\,f^{b\,x}\,\left(\frac{e^3}{2\,c^2\,{\ln\left(f\right)}^2}-\frac{3\,d^2\,e}{2\,c\,\ln\left(f\right)}-\frac{b^2\,e^3}{8\,c^3\,\ln\left(f\right)}+\frac{3\,b\,d\,e^2}{4\,c^2\,\ln\left(f\right)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)*(d + e*x)^3,x)
```

```
[Out] (e^3*f^a*f^(c*x^2)*f^(b*x)*x^2)/(2*c*log(f)) - (f^(a - b^2/(4*c))*pi^(1/2)*
erfi(((b*log(f))/2 + c*x*log(f))/(c*log(f))^(1/2))*((3*c^2*d*e^2)/4 + (b^3*
e^3*log(f))/16 - (c^3*d^3*log(f))/2 - (3*b*c*e^3)/8 + (3*b*c^2*d^2*e*log(f)
)/4 - (3*b^2*c*d*e^2*log(f))/8))/(c^3*log(f)*(c*log(f))^(1/2)) - (f^a*f^(c*
x^2)*f^(b*x)*x*(b*e^3 - 6*c*d*e^2))/(4*c^2*log(f)) - f^a*f^(c*x^2)*f^(b*x)*
(e^3/(2*c^2*log(f)^2) - (3*d^2*e)/(2*c*log(f)) - (b^2*e^3)/(8*c^3*log(f)) +
 (3*b*d*e^2)/(4*c^2*log(f)))
```

3.445 $\int f^{a+bx+cx^2}(d+ex)^2\,dx$

Optimal. Leaf size=189

$$-\frac{e^2 f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\text{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{4c^{3/2}\log^{\frac{3}{2}}(f)}+\frac{e(2cd-be)f^{a+bx+cx^2}}{4c^2\log(f)}+\frac{ef^{a+bx+cx^2}(d+ex)}{2c\log(f)}+\frac{(2cd-be)^2 f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\text{erfi}\left(\ldots\right)}{8c^{5/2}\sqrt{\log\ldots}}$$

[Out] 1/4*e*(-b*e+2*c*d)*f^(c*x^2+b*x+a)/c^2/ln(f)+1/2*e*f^(c*x^2+b*x+a)*(e*x+d)/c/ln(f)-1/4*e^2*f^(a-1/4*b^2/c)*erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c^(1/2))*Pi^(1/2)/c^(3/2)/ln(f)^(3/2)+1/8*(-b*e+2*c*d)^2*f^(a-1/4*b^2/c)*erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c^(1/2))*Pi^(1/2)/c^(5/2)/ln(f)^(1/2)

Rubi [A]
time = 0.09, antiderivative size = 189, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2273, 2272, 2266, 2235}

$$\frac{\sqrt{\pi}\,f^{a-\frac{b^2}{4c}}(2cd-be)^2\text{Erfi}\left(\frac{\sqrt{\log(f)}(b+2cx)}{2\sqrt{c}}\right)}{8c^{5/2}\sqrt{\log(f)}}-\frac{\sqrt{\pi}\,e^2 f^{a-\frac{b^2}{4c}}\text{Erfi}\left(\frac{\sqrt{\log(f)}(b+2cx)}{2\sqrt{c}}\right)}{4c^{3/2}\log^{\frac{3}{2}}(f)}+\frac{e(2cd-be)f^{a+bx+cx^2}}{4c^2\log(f)}+\frac{e(d+ex)f^{a+bx+cx^2}}{2c\log(f)}$$

Antiderivative was successfully verified.

[In] Int[f^(a + b*x + c*x^2)*(d + e*x)^2,x]

[Out] -1/4*(e^2*f^(a - b^2/(4*c))*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/(c^(3/2)*Log[f]^(3/2)) + (e*(2*c*d - b*e)*f^(a + b*x + c*x^2))/(4*c^2*Log[f]) + (e*f^(a + b*x + c*x^2)*(d + e*x))/(2*c*Log[f]) + ((2*c*d - b*e)^2*f^(a - b^2/(4*c))*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/(8*c^(5/2)*Sqrt[Log[f]])

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2272

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[e*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] - Dist[(b*e - 2*c*d)/(2*
c), Int[F^(a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[
```

```
b*e - 2*c*d, 0]
```

Rule 2273

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[e*(d + e*x)^(m - 1)*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] +
 (-Dist[(b*e - 2*c*d)/(2*c), Int[(d + e*x)^(m - 1)*F^(a + b*x + c*x^2), x],
 x] - Dist[(m - 1)*(e^2/(2*c*Log[F])), Int[(d + e*x)^(m - 2)*F^(a + b*x + c
*x^2), x], x]) /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[b*e - 2*c*d, 0] && Gt
Q[m, 1]
```

Rubi steps

$$\begin{aligned}\int f^{a+bx+cx^2}(d+ex)^2\,dx &= \frac{ef^{a+bx+cx^2}(d+ex)}{2c\log(f)} - \frac{(-2cd+be)\int f^{a+bx+cx^2}(d+ex)\,dx}{2c} - \frac{e^2\int f^{a+bx+cx^2}\,dx}{2c\log(f)} \\ &= \frac{e(2cd-be)f^{a+bx+cx^2}}{4c^2\log(f)} + \frac{ef^{a+bx+cx^2}(d+ex)}{2c\log(f)} + \frac{(2cd-be)^2\int f^{a+bx+cx^2}\,dx}{4c^2} - \frac{(e^2\cdots}{} \\ &= -\frac{e^2 f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{4c^{3/2}\log^{\frac{3}{2}}(f)} + \frac{e(2cd-be)f^{a+bx+cx^2}}{4c^2\log(f)} + \frac{ef^{a+bx+cx^2}(d+\cdots}{2c\log(f)} \\ &= -\frac{e^2 f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{4c^{3/2}\log^{\frac{3}{2}}(f)} + \frac{e(2cd-be)f^{a+bx+cx^2}}{4c^2\log(f)} + \frac{ef^{a+bx+cx^2}(d+\cdots}{2c\log(f)}\end{aligned}$$

Mathematica [A]
time = 0.34, size = 123, normalized size = 0.65

$$\frac{f^{a-\frac{b^2}{4c}}\left(2\sqrt{c}\,ef^{\frac{(b+2cx)^2}{4c}}(4cd-be+2cex)\sqrt{\log(f)}+\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)\left(-2ce^2+(-2cd+be)^2\log(f)\right)\right)}{8c^{5/2}\log^{\frac{3}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)*(d + e*x)^2,x]
```

```
[Out] (f^(a - b^2/(4*c))*(2*Sqrt[c]*e*f^((b + 2*c*x)^2/(4*c))*(4*c*d - b*e + 2*c*
e*x)*Sqrt[Log[f]] + Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])]*(
-2*c*e^2 + (-2*c*d + b*e)^2*Log[f])))/(8*c^(5/2)*Log[f]^(3/2))
```

Maple [A]
time = 0.09, size = 307, normalized size = 1.62

method	result
risch	$-\frac{d^{2}\sqrt{\pi}\, f^{a} f^{-\frac{b^{2}}{4c}} \operatorname{erf}\left(-\sqrt{-c\ln(f)}\, x+\frac{b\ln(f)}{2\sqrt{-c\ln(f)}}\right)}{2\sqrt{-c\ln(f)}}+\frac{e^{2}x f^{c\,x^{2}} f^{bx} f^{a}}{2c\ln(f)}-\frac{e^{2}b f^{c\,x^{2}} f^{bx} f^{a}}{4c^{2}\ln(f)}-\frac{e^{2}b^{2}\sqrt{\pi}\, f^{a} f^{-\frac{b^{2}}{4c}} \operatorname{er}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)*(e*x+d)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*d^2*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(-(-c*ln(f))^(1/2)
*x+1/2*b*ln(f)/(-c*ln(f))^(1/2))+1/2*e^2/c/ln(f)*x*f^(c*x^2)*f^(b*x)*f^a-1/
4*e^2/c^2*b/ln(f)*f^(c*x^2)*f^(b*x)*f^a-1/8*e^2/c^2*b^2*Pi^(1/2)*f^a*f^(-1/
4*b^2/c)/(-c*ln(f))^(1/2)*erf(-(-c*ln(f))^(1/2)*x+1/2*b*ln(f)/(-c*ln(f))^(1
/2))+1/4*e^2/c/ln(f)*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(-(-c*
ln(f))^(1/2)*x+1/2*b*ln(f)/(-c*ln(f))^(1/2))+e*d/c/ln(f)*f^(c*x^2)*f^(b*x)*
f^a+1/2*e*d*b/c*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(-(-c*ln(f)
)^(1/2)*x+1/2*b*ln(f)/(-c*ln(f))^(1/2))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 332 vs. $2(153) = 306$.
time = 0.39, size = 332, normalized size = 1.76

$$-\frac{\left(\frac{\sqrt{\pi}\,(2\,cx+b)b\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2\,cx+b)^{2}\log(f)}{c}}\right)-1\right)\log(f)^{2}}{\sqrt{-\frac{(2\,cx+b)^{2}\log(f)}{c}}\,(c\log(f))^{\frac{3}{2}}}-\frac{2\,cf^{\frac{(2\,cx+b)^{2}}{4\,c}}\log(f)}{(c\log(f))^{\frac{3}{2}}}\right)def^{a-\frac{b^{2}}{4\,c}}}{2\sqrt{c\log(f)}}+\frac{\left(\frac{\sqrt{\pi}\,(2\,cx+b)b^{2}\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2\,cx+b)^{2}\log(f)}{c}}\right)-1\right)\log(f)^{3}}{\sqrt{-\frac{(2\,cx+b)^{2}\log(f)}{c}}\,(c\log(f))^{\frac{5}{2}}}-\frac{4\,(2\,cx+b)^{3}\Gamma\left(\frac{3}{2},-\frac{(2\,cx+b)^{2}\log(f)}{4\,c}\right)\log(f)^{3}}{\left(-\frac{(2\,cx+b)^{2}\log(f)}{c}\right)^{\frac{3}{2}}(c\log(f))^{\frac{5}{2}}}-\frac{4\,bcf^{\frac{(2\,cx+b)^{2}}{4\,c}}\log(f)^{2}}{(c\log(f))^{\frac{5}{2}}}\right)e^{2}f^{a-\frac{b^{2}}{4\,c}}}{8\sqrt{c\log(f)}}+\frac{\sqrt{\pi}\,d^{2}f^{a}\operatorname{erf}\left(\sqrt{-c\log(f)}\,x-\frac{b\log(f)}{2\sqrt{-c\log(f)}}\right)}{2\sqrt{-c\log(f)}\,f^{\frac{b^{2}}{4\,c}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*(sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) - 1)*l
og(f)^2/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(3/2)) - 2*c*f^(1/4*(2*c*
x + b)^2/c)*log(f)/(c*log(f))^(3/2))*d*e*f^(a - 1/4*b^2/c)/sqrt(c*log(f)) +
 1/8*(sqrt(pi)*(2*c*x + b)*b^2*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) - 1)
*log(f)^3/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(5/2)) - 4*(2*c*x + b)^
3*gamma(3/2, -1/4*(2*c*x + b)^2*log(f)/c)*log(f)^3/((-(2*c*x + b)^2*log(f)/
c)^(3/2)*(c*log(f))^(5/2)) - 4*b*c*f^(1/4*(2*c*x + b)^2/c)*log(f)^2/(c*log(
f))^(5/2))*e^2*f^(a - 1/4*b^2/c)/sqrt(c*log(f)) + 1/2*sqrt(pi)*d^2*f^a*erf(
sqrt(-c*log(f))*x - 1/2*b*log(f)/sqrt(-c*log(f)))/(sqrt(-c*log(f))*f^(1/4*b
^2/c))
```

Fricas [A]
time = 0.38, size = 128, normalized size = 0.68

$$\frac{2\,(4\,c^{2}de+(2\,c^{2}x-bc)e^{2})f^{cx^{2}+bx+a}\log(f)+\frac{\sqrt{\pi}\,(2\,ce^{2}-(4\,c^{2}d^{2}-4\,bcde+b^{2}e^{2})\log(f))\sqrt{-c\log(f)}\operatorname{erf}\left(\frac{(2\,cx+b)\sqrt{-c\log(f)}}{2\,c}\right)}{f^{\frac{b^{2}-4\,ac}{4\,c}}}}{8\,c^{3}\log(f)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] 1/8*(2*(4*c^2*d*e + (2*c^2*x - b*c)*e^2)*f^(c*x^2 + b*x + a)*log(f) + sqrt(
pi)*(2*c*e^2 - (4*c^2*d^2 - 4*b*c*d*e + b^2*e^2)*log(f))*sqrt(-c*log(f))*er
f(1/2*(2*c*x + b)*sqrt(-c*log(f))/c)/f^(1/4*(b^2 - 4*a*c)/c))/(c^3*log(f)^2
)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx+cx^2}(d+ex)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)*(e*x+d)**2,x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)*(d + e*x)**2, x)
```

Giac [A]
time = 2.79, size = 252, normalized size = 1.33

$$-\frac{\sqrt{\pi}\,d^2\operatorname{erf}\left(-\frac{1}{2}\sqrt{-c\log\left(f\right)}\left(2\,x+\frac{b}{c}\right)\right)e^{\left(-\frac{b^2\log(f)-4\,ac\log(f)}{4\,c}\right)}}{2\,\sqrt{-c\log\left(f\right)}}+\frac{\frac{\sqrt{\pi}\,bd\operatorname{erf}\left(-\frac{1}{2}\sqrt{-c\log\left(f\right)}\left(2\,x+\frac{b}{c}\right)\right)e^{\left(-\frac{b^2\log(f)-4\,ac\log(f)-4\,c}{4\,c}\right)}}{\sqrt{-c\log\left(f\right)}}+\frac{2\,de^{\left(cx^2\log(f)+bx\log(f)+a\log(f)+1\right)}}{\log(f)}}{2\,c}-\frac{\frac{\sqrt{\pi}\,(b^2\log(f)-2\,c)\operatorname{erf}\left(-\frac{1}{2}\sqrt{-c\log\left(f\right)}\left(2\,x+\frac{b}{c}\right)\right)e^{\left(-\frac{b^2\log(f)-4\,ac\log(f)-8\,c}{4\,c}\right)}}{\sqrt{-c\log\left(f\right)}\log(f)}-\frac{2\left(c\left(2\,x+\frac{b}{c}\right)-2\,b\right)e^{\left(cx^2\log(f)+bx\log(f)+a\log(f)+2\right)}}{\log(f)}}{8\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(e*x+d)^2,x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*d^2*erf(-1/2*sqrt(-c*log(f))*(2*x + b/c))*e^(-1/4*(b^2*log(f)
 - 4*a*c*log(f))/c)/sqrt(-c*log(f)) + 1/2*(sqrt(pi)*b*d*erf(-1/2*sqrt(-c*lo
g(f))*(2*x + b/c))*e^(-1/4*(b^2*log(f) - 4*a*c*log(f) - 4*c)/c)/sqrt(-c*log
(f)) + 2*d*e^(c*x^2*log(f) + b*x*log(f) + a*log(f) + 1)/log(f))/c - 1/8*(sq
rt(pi)*(b^2*log(f) - 2*c)*erf(-1/2*sqrt(-c*log(f))*(2*x + b/c))*e^(-1/4*(b^
2*log(f) - 4*a*c*log(f) - 8*c)/c)/(sqrt(-c*log(f))*log(f)) - 2*(c*(2*x + b/
c) - 2*b)*e^(c*x^2*log(f) + b*x*log(f) + a*log(f) + 2)/log(f))/c^2
```

Mupad [B]
time = 3.85, size = 153, normalized size = 0.81

$$f^a\,f^{c\,x^2}\,f^{b\,x}\,\left(\frac{d\,e}{c\,\ln\left(f\right)}-\frac{b\,e^2}{4\,c^2\,\ln\left(f\right)}\right)+\frac{e^2\,f^a\,f^{c\,x^2}\,f^{b\,x}\,x}{2\,c\,\ln\left(f\right)}-\frac{f^{a-\frac{b^2}{4\,c}}\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\frac{b\,\ln\left(f\right)}{2}+c\,x\,\ln\left(f\right)}{\sqrt{c\,\ln\left(f\right)}}\right)\,\left(-\frac{\ln\left(f\right)\,b^2\,e^2}{8}+\frac{\ln\left(f\right)\,b\,c\,d\,e}{2}-\frac{\ln\left(f\right)\,c^2\,d^2}{2}+\frac{c\,e^2}{4}\right)}{c^2\,\ln\left(f\right)\,\sqrt{c\,\ln\left(f\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)*(d + e*x)^2,x)
```

```
[Out] f^a*f^(c*x^2)*f^(b*x)*((d*e)/(c*log(f)) - (b*e^2)/(4*c^2*log(f))) + (e^2*f^
a*f^(c*x^2)*f^(b*x)*x)/(2*c*log(f)) - (f^(a - b^2/(4*c))*pi^(1/2)*erfi(((b*
log(f))/2 + c*x*log(f))/(c*log(f))^(1/2))*((c*e^2)/4 - (b^2*e^2*log(f))/8 -
 (c^2*d^2*log(f))/2 + (b*c*d*e*log(f))/2))/(c^2*log(f)*(c*log(f))^(1/2))
```

3.446 $\int f^{a+bx+cx^2}(d+ex)\,dx$

Optimal. Leaf size=90

$$\frac{ef^{a+bx+cx^2}}{2c\log(f)}+\frac{(2cd-be)f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{4c^{3/2}\sqrt{\log(f)}}$$

```
[Out] 1/2*e*f^(c*x^2+b*x+a)/c/ln(f)+1/4*(-b*e+2*c*d)*f^(a-1/4*b^2/c)*erfi(1/2*(2*
c*x+b)*ln(f)^(1/2)/c^(1/2))*Pi^(1/2)/c^(3/2)/ln(f)^(1/2)
```

Rubi [A]

time = 0.03, antiderivative size = 90, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {2272, 2266, 2235}

$$\frac{\sqrt{\pi}\,f^{a-\frac{b^2}{4c}}(2cd-be)\mathrm{Erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{4c^{3/2}\sqrt{\log(f)}}+\frac{ef^{a+bx+cx^2}}{2c\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)*(d + e*x),x]
```

```
[Out] (e*f^(a + b*x + c*x^2))/(2*c*Log[f]) + ((2*c*d - b*e)*f^(a - b^2/(4*c))*Sqr
t[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/(4*c^(3/2)*Sqrt[Log[f]]
)
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2272

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[e*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] - Dist[(b*e - 2*c*d)/(2*
c), Int[F^(a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[
b*e - 2*c*d, 0]
```

Rubi steps

$$\int f^{a+bx+cx^2}(d+ex)\,dx = \frac{ef^{a+bx+cx^2}}{2c\log(f)} - \frac{(-2cd+be)\int f^{a+bx+cx^2}\,dx}{2c}$$
$$= \frac{ef^{a+bx+cx^2}}{2c\log(f)} + \frac{\left((2cd-be)f^{a-\frac{b^2}{4c}}\right)\int f^{\frac{(b+2cx)^2}{4c}}\,dx}{2c}$$
$$= \frac{ef^{a+bx+cx^2}}{2c\log(f)} + \frac{(2cd-be)f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{4c^{3/2}\sqrt{\log(f)}}$$

Mathematica [A]
time = 0.21, size = 96, normalized size = 1.07

$$\frac{f^{a-\frac{b^2}{4c}}\left(2\sqrt{c}\,ef^{\frac{(b+2cx)^2}{4c}} + (2cd-be)\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)\sqrt{\log(f)}\right)}{4c^{3/2}\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)*(d + e*x),x]
```

```
[Out] (f^(a - b^2/(4*c))*(2*Sqrt[c]*e*f^((b + 2*c*x)^2/(4*c)) + (2*c*d - b*e)*Sqr
t[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])]*Sqrt[Log[f]]))/(4*c^(3/2
)*Log[f])
```

Maple [A]
time = 0.04, size = 131, normalized size = 1.46

method	result
risch	$-\frac{d\sqrt{\pi}\,f^a f^{-\frac{b^2}{4c}}\,\mathrm{erf}\left(-\sqrt{-c\ln(f)}\,x+\frac{b\ln(f)}{2\sqrt{-c\ln(f)}}\right)}{2\sqrt{-c\ln(f)}} + \frac{e f^{cx^2} f^{bx} f^a}{2c\ln(f)} + \frac{eb\sqrt{\pi}\,f^a f^{-\frac{b^2}{4c}}\,\mathrm{erf}\left(-\sqrt{-c\ln(f)}\,x\right.}{4c\sqrt{-c\ln(f)}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)*(e*x+d),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*d*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(-(-c*ln(f))^(1/2)*x
+1/2*b*ln(f)/(-c*ln(f))^(1/2))+1/2*e/c/ln(f)*f^(c*x^2)*f^(b*x)*f^a+1/4*e*b/
c*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(-(-c*ln(f))^(1/2)*x+1/2*
b*ln(f)/(-c*ln(f))^(1/2))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 160 vs. $2(72) = 144$.

time = 0.35, size = 160, normalized size = 1.78

$$-\frac{\left(\frac{\sqrt{\pi}\,(2\,cx+b)b\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2\,cx+b)^2\log(f)}{c}}\right)-1\right)\log(f)^2}{\sqrt{-\frac{(2\,cx+b)^2\log(f)}{c}}\,(c\log(f))^{\frac{3}{2}}}-\frac{2\,cf^{\frac{(2\,cx+b)^2}{4\,c}}\log(f)}{(c\log(f))^{\frac{3}{2}}}\right)ef^{a-\frac{b^2}{4\,c}}}{4\,\sqrt{c\log(f)}}+\frac{\sqrt{\pi}\,df^a\operatorname{erf}\left(\sqrt{-c\log(f)}\,x-\frac{b\log(f)}{2\,\sqrt{-c\log(f)}}\right)}{2\,\sqrt{-c\log(f)}\,f^{\frac{b^2}{4\,c}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(e*x+d),x, algorithm="maxima")
```

```
[Out] -1/4*(sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) - 1)*l
og(f)^2/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(3/2)) - 2*c*f^(1/4*(2*c*
x + b)^2/c)*log(f)/(c*log(f))^(3/2))*e*f^(a - 1/4*b^2/c)/sqrt(c*log(f)) + 1
/2*sqrt(pi)*d*f^a*erf(sqrt(-c*log(f))*x - 1/2*b*log(f)/sqrt(-c*log(f)))/(sq
rt(-c*log(f))*f^(1/4*b^2/c))
```

Fricas [A]
time = 0.37, size = 85, normalized size = 0.94

$$\frac{2\,cf^{cx^2+bx+a}e-\frac{\sqrt{\pi}\,(2\,cd-be)\sqrt{-c\log(f)}\operatorname{erf}\left(\frac{(2\,cx+b)\sqrt{-c\log(f)}}{2\,c}\right)}{f^{\frac{b^2-4\,ac}{4\,c}}}}{4\,c^2\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(e*x+d),x, algorithm="fricas")
```

```
[Out] 1/4*(2*c*f^(c*x^2 + b*x + a)*e - sqrt(pi)*(2*c*d - b*e)*sqrt(-c*log(f))*erf
(1/2*(2*c*x + b)*sqrt(-c*log(f))/c)/f^(1/4*(b^2 - 4*a*c)/c))/(c^2*log(f))
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx+cx^2}(d+ex)\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)*(e*x+d),x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)*(d + e*x), x)
```

Giac [A]
time = 2.81, size = 136, normalized size = 1.51

$$-\frac{\sqrt{\pi}\,d\operatorname{erf}\left(-\frac{1}{2}\,\sqrt{-c\log(f)}\,\left(2\,x+\frac{b}{c}\right)\right)e^{\left(-\frac{b^2\log(f)-4\,ac\log(f)}{4\,c}\right)}}{2\,\sqrt{-c\log(f)}}+\frac{\frac{\sqrt{\pi}\,b\operatorname{erf}\left(-\frac{1}{2}\,\sqrt{-c\log(f)}\,\left(2\,x+\frac{b}{c}\right)\right)e^{\left(-\frac{b^2\log(f)-4\,ac\log(f)-4\,c}{4\,c}\right)}}{\sqrt{-c\log(f)}}+\frac{2\,e^{\left(cx^2\log(f)+bx\log(f)+a\log(f)+1\right)}}{\log(f)}}{4\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(e*x+d),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*d*erf(-1/2*sqrt(-c*log(f))*(2*x + b/c))*e^(-1/4*(b^2*log(f) -
 4*a*c*log(f))/c)/sqrt(-c*log(f)) + 1/4*(sqrt(pi)*b*erf(-1/2*sqrt(-c*log(f)
)*(2*x + b/c))*e^(-1/4*(b^2*log(f) - 4*a*c*log(f) - 4*c)/c)/sqrt(-c*log(f))
 + 2*e^(c*x^2*log(f) + b*x*log(f) + a*log(f) + 1)/log(f))/c
```

Mupad [B]
time = 3.71, size = 80, normalized size = 0.89

$$\frac{e\,f^a\,f^{c\,x^2}\,f^{b\,x}}{2\,c\,\ln\left(f\right)}-\frac{f^{a-\frac{b^2}{4\,c}}\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\frac{b\,\ln(f)}{2}+c\,x\,\ln(f)}{\sqrt{c\,\ln\left(f\right)}}\right)\,\left(\frac{b\,e}{4}-\frac{c\,d}{2}\right)}{c\,\sqrt{c\,\ln\left(f\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)*(d + e*x),x)
```

```
[Out] (e*f^a*f^(c*x^2)*f^(b*x))/(2*c*log(f)) - (f^(a - b^2/(4*c))*pi^(1/2)*erfi((
(b*log(f))/2 + c*x*log(f))/(c*log(f))^(1/2))*((b*e)/4 - (c*d)/2))/(c*(c*log
(f))^(1/2))
```

3.447 $\int \frac{f^{a+bx+cx^2}}{d+ex} dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{f^{a+bx+cx^2}}{d+ex},x\right)$$

```
[Out] Unintegrable(f^(c*x^2+b*x+a)/(e*x+d),x)
```

Rubi [A]
time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{f^{a+bx+cx^2}}{d+ex} dx$$

Verification is not applicable to the result.

```
[In] Int[f^(a + b*x + c*x^2)/(d + e*x),x]
[Out] Defer[Int][f^(a + b*x + c*x^2)/(d + e*x), x]
```

Rubi steps

$$\int \frac{f^{a+bx+cx^2}}{d+ex} dx = \int \frac{f^{a+bx+cx^2}}{d+ex} dx$$

Mathematica [A]
time = 0.36, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx+cx^2}}{d+ex} dx$$

Verification is not applicable to the result.

```
[In] Integrate[f^(a + b*x + c*x^2)/(d + e*x),x]
[Out] Integrate[f^(a + b*x + c*x^2)/(d + e*x), x]
```

Maple [A]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{f^{c\,x^2+bx+a}}{ex+d} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)/(e*x+d),x)
```

```
[Out] int(f^(c*x^2+b*x+a)/(e*x+d),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(e*x+d),x, algorithm="maxima")
```

```
[Out] integrate(f^(c*x^2 + b*x + a)/(e*x + d), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral(f^(c*x^2 + b*x + a)/(x*e + d), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx+cx^2}}{d+ex}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)/(e*x+d),x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)/(d + e*x), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(e*x+d),x, algorithm="giac")
```

```
[Out] integrate(f^(c*x^2 + b*x + a)/(x*e + d), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{f^{c\,x^2+b\,x+a}}{d+e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)/(d + e*x),x)
[Out] int(f^(a + b*x + c*x^2)/(d + e*x), x)
```

3.448 $\int \frac{f^{a+bx+cx^2}}{(d+ex)^2}\,dx$

Optimal. Leaf size=120

$$-\frac{f^{a+bx+cx^2}}{e(d+ex)}+\frac{\sqrt{c}\,f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)\sqrt{\log(f)}}{e^2}-\frac{(2cd-be)\log(f)\mathrm{Int}\left(\frac{f^{a+bx+cx^2}}{d+ex},x\right)}{e^2}$$

```
[Out] -f^(c*x^2+b*x+a)/e/(e*x+d)+f^(a-1/4*b^2/c)*erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c
^(1/2))*c^(1/2)*Pi^(1/2)*ln(f)^(1/2)/e^2-(-b*e+2*c*d)*ln(f)*Unintegrable(f^
(c*x^2+b*x+a)/(e*x+d),x)/e^2
```

Rubi [A]
time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{f^{a+bx+cx^2}}{(d+ex)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[f^(a + b*x + c*x^2)/(d + e*x)^2,x]
```

```
[Out] -(f^(a + b*x + c*x^2)/(e*(d + e*x))) + (Sqrt[c]*f^(a - b^2/(4*c))*Sqrt[Pi]*
Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])]*Sqrt[Log[f]])/e^2 - ((2*c*d -
b*e)*Log[f]*Defer[Int][f^(a + b*x + c*x^2)/(d + e*x), x])/e^2
```

Rubi steps

$$\begin{aligned}\int \frac{f^{a+bx+cx^2}}{(d+ex)^2}\,dx &= -\frac{f^{a+bx+cx^2}}{e(d+ex)}+\frac{(2c\log(f))\int f^{a+bx+cx^2}\,dx}{e^2}-\frac{((2cd-be)\log(f))\int \frac{f^{a+bx+cx^2}}{d+ex}\,dx}{e^2}\\ &= -\frac{f^{a+bx+cx^2}}{e(d+ex)}-\frac{((2cd-be)\log(f))\int \frac{f^{a+bx+cx^2}}{d+ex}\,dx}{e^2}+\frac{\left(2cf^{a-\frac{b^2}{4c}}\log(f)\right)\int f^{\frac{(b+2cx)^2}{4c}}\,dx}{e^2}\\ &= -\frac{f^{a+bx+cx^2}}{e(d+ex)}+\frac{\sqrt{c}\,f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)\sqrt{\log(f)}}{e^2}-\frac{((2cd-be)\log(f))\int f^{a}}{e^2}\end{aligned}$$

Mathematica [A]
time = 0.75, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx+cx^2}}{(d+ex)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[f^(a + b*x + c*x^2)/(d + e*x)^2,x]
```

```
[Out] Integrate[f^(a + b*x + c*x^2)/(d + e*x)^2, x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{f^{c\,x^{2}+b x +a}}{\left(e x +d \right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)/(e*x+d)^2,x)
```

```
[Out] int(f^(c*x^2+b*x+a)/(e*x+d)^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] integrate(f^(c*x^2 + b*x + a)/(e*x + d)^2, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] integral(f^(c*x^2 + b*x + a)/(x^2*e^2 + 2*d*x*e + d^2), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a + b x + c x^{2}}}{\left(d + e x\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)/(e*x+d)**2,x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)/(d + e*x)**2, x)
```

Giac [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(e*x+d)^2,x, algorithm="giac")
```

```
[Out] integrate(f^(c*x^2 + b*x + a)/(x*e + d)^2, x)
```

Mupad [**A**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{f^{c\,x^2+b\,x+a}}{{\left(d+e\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)/(d + e*x)^2,x)
```

```
[Out] int(f^(a + b*x + c*x^2)/(d + e*x)^2, x)
```

3.449 $\int \frac{f^{a+bx+cx^2}}{(d+ex)^3} dx$

Optimal. Leaf size=207

$$-\frac{f^{a+bx+cx^2}}{2e(d+ex)^2}+\frac{(2cd-be)f^{a+bx+cx^2}\log(f)}{2e^3(d+ex)}-\frac{\sqrt{c}\,(2cd-be)f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\text{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)\log^{\frac{3}{2}}(f)}{2e^4}+\frac{c\log(f}{}$$

```
[Out] -1/2*f^(c*x^2+b*x+a)/e/(e*x+d)^2+1/2*(-b*e+2*c*d)*f^(c*x^2+b*x+a)*ln(f)/e^3
/(e*x+d)-1/2*(-b*e+2*c*d)*f^(a-1/4*b^2/c)*erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c^
(1/2))*ln(f)^(3/2)*c^(1/2)*Pi^(1/2)/e^4+c*ln(f)*Unintegrable(f^(c*x^2+b*x+a
)/(e*x+d),x)/e^2+1/2*(-b*e+2*c*d)^2*ln(f)^2*Unintegrable(f^(c*x^2+b*x+a)/(e
*x+d),x)/e^4
```

Rubi [A]
time = 0.15, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{f^{a+bx+cx^2}}{(d+ex)^3} dx$$

Verification is not applicable to the result.

```
[In] Int[f^(a + b*x + c*x^2)/(d + e*x)^3,x]
```

```
[Out] -1/2*f^(a + b*x + c*x^2)/(e*(d + e*x)^2) + ((2*c*d - b*e)*f^(a + b*x + c*x^
2)*Log[f])/(2*e^3*(d + e*x)) - (Sqrt[c]*(2*c*d - b*e)*f^(a - b^2/(4*c))*Sqr
t[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])]*Log[f]^(3/2))/(2*e^4) +
(c*Log[f]*Defer[Int][f^(a + b*x + c*x^2)/(d + e*x), x])/e^2 + ((2*c*d - b*e
)^2*Log[f]^2*Defer[Int][f^(a + b*x + c*x^2)/(d + e*x), x])/(2*e^4)
```

Rubi steps

$$\begin{aligned}
\int \frac{f^{a+bx+cx^2}}{(d+ex)^3} dx &= -\frac{f^{a+bx+cx^2}}{2e(d+ex)^2}+\frac{(c\log(f))\int \frac{f^{a+bx+cx^2}}{d+ex} dx}{e^2}-\frac{((2cd-be)\log(f))\int \frac{f^{a+bx+cx^2}}{(d+ex)^2} dx}{2e^2}\\
&= -\frac{f^{a+bx+cx^2}}{2e(d+ex)^2}+\frac{(2cd-be)f^{a+bx+cx^2}\log(f)}{2e^3(d+ex)}+\frac{(c\log(f))\int \frac{f^{a+bx+cx^2}}{d+ex} dx}{e^2}-\frac{(c(2cd-be)\log^2}{}\\
&= -\frac{f^{a+bx+cx^2}}{2e(d+ex)^2}+\frac{(2cd-be)f^{a+bx+cx^2}\log(f)}{2e^3(d+ex)}+\frac{(c\log(f))\int \frac{f^{a+bx+cx^2}}{d+ex} dx}{e^2}+\frac{((2cd-be)^2\log^2}{2}\\
&= -\frac{f^{a+bx+cx^2}}{2e(d+ex)^2}+\frac{(2cd-be)f^{a+bx+cx^2}\log(f)}{2e^3(d+ex)}-\frac{\sqrt{c}\,(2cd-be)f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\text{erfi}\left(\frac{(b+2cx)\sqrt{\log(f}}{2\sqrt{c}}\right.}{2e^4}
\end{aligned}$$

Mathematica [A]
time = 0.85, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx+cx^2}}{(d+ex)^3} \, dx$$

Verification is not applicable to the result.

```
[In] Integrate[f^(a + b*x + c*x^2)/(d + e*x)^3,x]
[Out] Integrate[f^(a + b*x + c*x^2)/(d + e*x)^3, x]
```

Maple [A]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{f^{c\,x^2+bx+a}}{(ex+d)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)/(e*x+d)^3,x)
[Out] int(f^(c*x^2+b*x+a)/(e*x+d)^3,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(e*x+d)^3,x, algorithm="maxima")
[Out] integrate(f^(c*x^2 + b*x + a)/(e*x + d)^3, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(e*x+d)^3,x, algorithm="fricas")
[Out] integral(f^(c*x^2 + b*x + a)/(x^3*e^3 + 3*d*x^2*e^2 + 3*d^2*x*e + d^3), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx+cx^2}}{(d+ex)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)/(e*x+d)**3,x)
[Out] Integral(f**(a + b*x + c*x**2)/(d + e*x)**3, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(e*x+d)^3,x, algorithm="giac")
[Out] integrate(f^(c*x^2 + b*x + a)/(x*e + d)^3, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{f^{c\,x^2+b\,x+a}}{{\left(d+e\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)/(d + e*x)^3,x)
[Out] int(f^(a + b*x + c*x^2)/(d + e*x)^3, x)
```

3.450 $\int f^{a+bx+cx^2}(b+2cx)^3\,dx$

Optimal. Leaf size=45

$$-\frac{4cf^{a+bx+cx^2}}{\log^2(f)}+\frac{f^{a+bx+cx^2}(b+2cx)^2}{\log(f)}$$

```
[Out] -4*c*f^(c*x^2+b*x+a)/ln(f)^2+f^(c*x^2+b*x+a)*(2*c*x+b)^2/ln(f)
```

Rubi [A]
time = 0.04, antiderivative size = 45, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}=0.095$, Rules used = {2269, 2268}

$$\frac{(b+2cx)^2f^{a+bx+cx^2}}{\log(f)}-\frac{4cf^{a+bx+cx^2}}{\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)*(b + 2*c*x)^3,x]
```

```
[Out] (-4*c*f^(a + b*x + c*x^2))/Log[f]^2 + (f^(a + b*x + c*x^2)*(b + 2*c*x)^2)/L
og[f]
```

Rule 2268

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[e*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] /; FreeQ[{F, a, b, c, d,
 e}, x] && EqQ[b*e - 2*c*d, 0]
```

Rule 2269

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[e*(d + e*x)^(m - 1)*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] -
 Dist[(m - 1)*(e^2/(2*c*Log[F])), Int[(d + e*x)^(m - 2)*F^(a + b*x + c*x^2)
, x], x] /; FreeQ[{F, a, b, c, d, e}, x] && EqQ[b*e - 2*c*d, 0] && GtQ[m, 1
]
```

Rubi steps

$$\begin{aligned}\int f^{a+bx+cx^2}(b+2cx)^3\,dx&=\frac{f^{a+bx+cx^2}(b+2cx)^2}{\log(f)}-\frac{(4c)\int f^{a+bx+cx^2}(b+2cx)\,dx}{\log(f)}\\&=-\frac{4cf^{a+bx+cx^2}}{\log^2(f)}+\frac{f^{a+bx+cx^2}(b+2cx)^2}{\log(f)}\end{aligned}$$

Mathematica [A]
time = 0.59, size = 31, normalized size = 0.69

$$\frac{f^{a+x(b+cx)}(-4c+(b+2cx)^2\log(f))}{\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)*(b + 2*c*x)^3,x]
```

```
[Out] (f^(a + x*(b + c*x))*(-4*c + (b + 2*c*x)^2*Log[f]))/Log[f]^2
```

Maple [A]
time = 0.08, size = 45, normalized size = 1.00

method	result	size
gosper	$\frac{\left(4\ln(f)c^2x^2+4bcx\ln(f)+\ln(f)b^2-4c\right)f^{c\,x^2+bx+a}}{\ln(f)^2}$	45
risch	$\frac{\left(4\ln(f)c^2x^2+4bcx\ln(f)+\ln(f)b^2-4c\right)f^{c\,x^2+bx+a}}{\ln(f)^2}$	45
norman	$\frac{\left(\ln(f)b^2-4c\right)\mathrm{e}^{\left(c\,x^2+bx+a\right)\ln(f)}}{\ln(f)^2}+\frac{4c^2x^2\mathrm{e}^{\left(c\,x^2+bx+a\right)\ln(f)}}{\ln(f)}+\frac{4cbx\,\mathrm{e}^{\left(c\,x^2+bx+a\right)\ln(f)}}{\ln(f)}$	80

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)*(2*c*x+b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] (4*ln(f)*c^2*x^2+4*b*c*x*ln(f)+ln(f)*b^2-4*c)*f^(c*x^2+b*x+a)/ln(f)^2
```

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 0.47, size = 539, normalized size = 11.98

$$-\frac{3\left(\frac{\sqrt{\pi}(2cx+b)b\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}\right)-1\right)\log(f)^2}{\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}(c\log(f))^{\frac{3}{2}}}-\frac{2cf^{\frac{(2cx+b)^2}{4c}}\log(f)}{(c\log(f))^{\frac{3}{2}}}\right)b^2cf^{a-\frac{b^2}{4c}}}{2\sqrt{c\log(f)}}+\frac{3\left(\frac{\sqrt{\pi}(2cx+b)b^2\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}\right)-1\right)\log(f)^3}{\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}(c\log(f))^{\frac{5}{2}}}-\frac{4(2cx+b)^3\Gamma\left(\frac{3}{2},-\frac{(2cx+b)^2\log(f)}{4c}\right)\log(f)^3}{\left(-\frac{(2cx+b)^2\log(f)}{c}\right)^{\frac{3}{2}}(c\log(f))^{\frac{5}{2}}}-\frac{4bcf^{\frac{(2cx+b)^2}{4c}}\log(f)^2}{(c\log(f))^{\frac{5}{2}}}\right)bc^2f^{a-\frac{b^2}{4c}}}{2\sqrt{c\log(f)}}-\frac{\left(\frac{\sqrt{\pi}(2cx+b)b^3\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}\right)-1\right)\log(f)^4}{\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}(c\log(f))^{\frac{7}{2}}}-\frac{12(2cx+b)^3b\Gamma\left(\frac{3}{2},-\frac{(2cx+b)^2\log(f)}{4c}\right)\log(f)^4}{\left(-\frac{(2cx+b)^2\log(f)}{c}\right)^{\frac{3}{2}}(c\log(f))^{\frac{7}{2}}}-\frac{6b^2cf^{\frac{(2cx+b)^2}{4c}}\log(f)^3}{(c\log(f))^{\frac{7}{2}}}+\frac{8c^2\Gamma\left(2,-\frac{(2cx+b)^2\log(f)}{4c}\right)\log(f)^2}{(c\log(f))^{\frac{7}{2}}}\right)c^3f^{a-\frac{b^2}{4c}}}{2\sqrt{c\log(f)}}+\frac{\sqrt{\pi}b^3f^a\operatorname{erf}\left(\sqrt{-c\log(f)}x-\frac{b\log(f)}{2\sqrt{-c\log(f)}}\right)}{2\sqrt{-c\log(f)}f^{\frac{b^2}{4c}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(2*c*x+b)^3,x, algorithm="maxima")
```

```
[Out] -3/2*(sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) - 1)*l
og(f)^2/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(3/2)) - 2*c*f^(1/4*(2*c*
x + b)^2/c)*log(f)/(c*log(f))^(3/2))*b^2*c*f^(a - 1/4*b^2/c)/sqrt(c*log(f))
 + 3/2*(sqrt(pi)*(2*c*x + b)*b^2*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) -
1)*log(f)^3/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(5/2)) - 4*(2*c*x + b
)^3*gamma(3/2, -1/4*(2*c*x + b)^2*log(f)/c)*log(f)^3/((-(2*c*x + b)^2*log(f
)/c)^(3/2)*(c*log(f))^(5/2)) - 4*b*c*f^(1/4*(2*c*x + b)^2/c)*log(f)^2/(c*lo
g(f))^(5/2))*b*c^2*f^(a - 1/4*b^2/c)/sqrt(c*log(f)) - 1/2*(sqrt(pi)*(2*c*x
+ b)*b^3*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) - 1)*log(f)^4/(sqrt(-(2*c*
```

```
x + b)^2*log(f)/c)*(c*log(f))^(7/2)) - 12*(2*c*x + b)^3*b*gamma(3/2, -1/4*(
2*c*x + b)^2*log(f)/c)*log(f)^4/((-(2*c*x + b)^2*log(f)/c)^(3/2)*(c*log(f))
^(7/2)) - 6*b^2*c*f^(1/4*(2*c*x + b)^2/c)*log(f)^3/(c*log(f))^(7/2) + 8*c^2
*gamma(2, -1/4*(2*c*x + b)^2*log(f)/c)*log(f)^2/(c*log(f))^(7/2))*c^3*f^(a
- 1/4*b^2/c)/sqrt(c*log(f)) + 1/2*sqrt(pi)*b^3*f^a*erf(sqrt(-c*log(f))*x -
1/2*b*log(f)/sqrt(-c*log(f)))/(sqrt(-c*log(f))*f^(1/4*b^2/c))
```

Fricas [A]
time = 0.38, size = 41, normalized size = 0.91

$$\frac{\left(\left(4\,c^2x^2+4\,bcx+b^2\right)\log\left(f\right)-4\,c\right)f^{cx^2+bx+a}}{\log\left(f\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(2*c*x+b)^3,x, algorithm="fricas")
```

```
[Out] ((4*c^2*x^2 + 4*b*c*x + b^2)*log(f) - 4*c)*f^(c*x^2 + b*x + a)/log(f)^2
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 85 vs. 2(42) = 84.
time = 0.06, size = 85, normalized size = 1.89

$$\begin{cases} \frac{f^{a+bx+cx^2}\left(b^2\log\left(f\right)+4bcx\log\left(f\right)+4c^2x^2\log\left(f\right)-4c\right)}{\log\left(f\right)^2} & \text{for}\ \log\left(f\right)^2\neq 0 \\ b^3x+3b^2cx^2+4bc^2x^3+2c^3x^4 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)*(2*c*x+b)**3,x)
```

```
[Out] Piecewise((f**(a + b*x + c*x**2)*(b**2*log(f) + 4*b*c*x*log(f) + 4*c**2*x**
2*log(f) - 4*c)/log(f)**2, Ne(log(f)**2, 0)), (b**3*x + 3*b**2*c*x**2 + 4*b
*c**2*x**3 + 2*c**3*x**4, True))
```

Giac [C] Result contains complex when optimal does not.
time = 2.85, size = 798, normalized size = 17.73

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(2*c*x+b)^3,x, algorithm="giac")
```

```
[Out] (2*((b^2*log(abs(f)) + 4*(c*x^2 + b*x)*c*log(abs(f)) - 4*c)*(pi^2*sgn(f) -
pi^2 + 2*log(abs(f))^2)/((pi^2*sgn(f) - pi^2 + 2*log(abs(f))^2)^2 + 4*(pi*l
og(abs(f))*sgn(f) - pi*log(abs(f)))^2) + (pi*b^2*sgn(f) + 4*pi*(c*x^2 + b*x
)*c*sgn(f) - pi*b^2 - 4*pi*(c*x^2 + b*x)*c)*(pi*log(abs(f))*sgn(f) - pi*log
(abs(f)))/((pi^2*sgn(f) - pi^2 + 2*log(abs(f))^2)^2 + 4*(pi*log(abs(f))*sgn
```

```
(f) - pi*log(abs(f)))^2))*cos(-1/2*pi*c*x^2*sgn(f) + 1/2*pi*c*x^2 - 1/2*pi*
b*x*sgn(f) + 1/2*pi*b*x - 1/2*pi*a*sgn(f) + 1/2*pi*a) + ((pi*b^2*sgn(f) + 4
*pi*(c*x^2 + b*x)*c*sgn(f) - pi*b^2 - 4*pi*(c*x^2 + b*x)*c)*(pi^2*sgn(f) -
pi^2 + 2*log(abs(f))^2)/((pi^2*sgn(f) - pi^2 + 2*log(abs(f))^2)^2 + 4*(pi*l
og(abs(f))*sgn(f) - pi*log(abs(f)))^2) - 4*(b^2*log(abs(f)) + 4*(c*x^2 + b*
x)*c*log(abs(f)) - 4*c)*(pi*log(abs(f))*sgn(f) - pi*log(abs(f)))/((pi^2*sgn
(f) - pi^2 + 2*log(abs(f))^2)^2 + 4*(pi*log(abs(f))*sgn(f) - pi*log(abs(f))
)^2))*sin(-1/2*pi*c*x^2*sgn(f) + 1/2*pi*c*x^2 - 1/2*pi*b*x*sgn(f) + 1/2*pi*
b*x - 1/2*pi*a*sgn(f) + 1/2*pi*a))*e^((c*x^2 + b*x)*log(abs(f)) + a*log(abs
(f))) - 1/2*I*((pi*b^2*sgn(f) + 4*pi*(c*x^2 + b*x)*c*sgn(f) - pi*b^2 - 4*pi
*(c*x^2 + b*x)*c - 2*I*b^2*log(abs(f)) + 8*(-I*c*x^2 - I*b*x)*c*log(abs(f))
 + 8*I*c)*e^(1/2*I*pi*c*x^2*sgn(f) - 1/2*I*pi*c*x^2 + 1/2*I*pi*b*x*sgn(f) -
 1/2*I*pi*b*x + 1/2*I*pi*a*sgn(f) - 1/2*I*pi*a)/(pi^2*sgn(f) + 2*I*pi*log(a
bs(f))*sgn(f) - pi^2 - 2*I*pi*log(abs(f)) + 2*log(abs(f))^2) + (pi*b^2*sgn(
f) + 4*pi*(c*x^2 + b*x)*c*sgn(f) - pi*b^2 - 4*pi*(c*x^2 + b*x)*c + 2*I*b^2*
log(abs(f)) - 8*(-I*c*x^2 - I*b*x)*c*log(abs(f)) - 8*I*c)*e^(-1/2*I*pi*c*x^
2*sgn(f) + 1/2*I*pi*c*x^2 - 1/2*I*pi*b*x*sgn(f) + 1/2*I*pi*b*x - 1/2*I*pi*a
*sgn(f) + 1/2*I*pi*a)/(pi^2*sgn(f) - 2*I*pi*log(abs(f))*sgn(f) - pi^2 + 2*I
*pi*log(abs(f)) + 2*log(abs(f))^2))*e^((c*x^2 + b*x)*log(abs(f)) + a*log(ab
s(f)))
```

Mupad [B]
time = 3.81, size = 44, normalized size = 0.98

$$\frac{f^{c\,x^2+b\,x+a}\,\left(\ln\left(f\right)\,b^2+4\,\ln\left(f\right)\,b\,c\,x+4\,\ln\left(f\right)\,c^2\,x^2-4\,c\right)}{{\ln\left(f\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)*(b + 2*c*x)^3,x)
```

```
[Out] (f^(a + b*x + c*x^2)*(b^2*log(f) - 4*c + 4*c^2*x^2*log(f) + 4*b*c*x*log(f))
)/log(f)^2
```

3.451 $\int f^{a+bx+cx^2}(b+2cx)^2\,dx$

Optimal. Leaf size=78

$$-\frac{\sqrt{c}\, f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{\log^{\frac{3}{2}}(f)}+\frac{f^{a+bx+cx^2}(b+2cx)}{\log(f)}$$

```
[Out] f^(c*x^2+b*x+a)*(2*c*x+b)/ln(f)-f^(a-1/4*b^2/c)*erfi(1/2*(2*c*x+b)*ln(f)^(1
/2)/c^(1/2))*c^(1/2)*Pi^(1/2)/ln(f)^(3/2)
```

Rubi [A]
time = 0.04, antiderivative size = 78, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {2269, 2266, 2235}

$$\frac{(b+2cx)f^{a+bx+cx^2}}{\log(f)}-\frac{\sqrt{\pi}\sqrt{c}\, f^{a-\frac{b^2}{4c}}\mathrm{Erfi}\left(\frac{\sqrt{\log(f)}(b+2cx)}{2\sqrt{c}}\right)}{\log^{\frac{3}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)*(b + 2*c*x)^2,x]
```

```
[Out] -((Sqrt[c]*f^(a - b^2/(4*c))*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sq
rt[c])])/Log[f]^(3/2)) + (f^(a + b*x + c*x^2)*(b + 2*c*x))/Log[f]
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2269

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[e*(d + e*x)^(m - 1)*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] -
 Dist[(m - 1)*(e^2/(2*c*Log[F])), Int[(d + e*x)^(m - 2)*F^(a + b*x + c*x^2)
, x], x] /; FreeQ[{F, a, b, c, d, e}, x] && EqQ[b*e - 2*c*d, 0] && GtQ[m, 1
]
```

Rubi steps

$$\int f^{a+bx+cx^2}(b+2cx)^2\,dx = \frac{f^{a+bx+cx^2}(b+2cx)}{\log(f)} - \frac{(2c)\int f^{a+bx+cx^2}\,dx}{\log(f)}$$
$$= \frac{f^{a+bx+cx^2}(b+2cx)}{\log(f)} - \frac{\left(2cf^{a-\frac{b^2}{4c}}\right)\int f^{\frac{(b+2cx)^2}{4c}}\,dx}{\log(f)}$$
$$= -\frac{\sqrt{c}\,f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{\log^{\frac{3}{2}}(f)} + \frac{f^{a+bx+cx^2}(b+2cx)}{\log(f)}$$

Mathematica [A]
time = 0.56, size = 86, normalized size = 1.10

$$\frac{f^{a-\frac{b^2}{4c}}\left(-\sqrt{c}\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right) + f^{\frac{(b+2cx)^2}{4c}}(b+2cx)\sqrt{\log(f)}\right)}{\log^{\frac{3}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)*(b + 2*c*x)^2,x]
```

```
[Out] (f^(a - b^2/(4*c))*(-(Sqrt[c]*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*S
qrt[c])]) + f^((b + 2*c*x)^2/(4*c))*(b + 2*c*x)*Sqrt[Log[f]]))/Log[f]^(3/2)
```

Maple [A]
time = 0.08, size = 99, normalized size = 1.27

method	result	size
risch	$\frac{2cx\,f^{c\,x^2} f^{bx} f^{a}}{\ln(f)} + \frac{b\,f^{c\,x^2} f^{bx} f^{a}}{\ln(f)} + \frac{c\sqrt{\pi}\;f^{a} f^{-\frac{b^2}{4c}}\,\mathrm{erf}\left(-\sqrt{-c\ln(f)}\;x + \frac{b\ln(f)}{2\sqrt{-c\ln(f)}}\right)}{\ln(f)\sqrt{-c\ln(f)}}$	99

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)*(2*c*x+b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 2*c/ln(f)*x*f^(c*x^2)*f^(b*x)*f^a+b/ln(f)*f^(c*x^2)*f^(b*x)*f^a+c/ln(f)*Pi^
(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(-(-c*ln(f))^(1/2)*x+1/2*b*ln(
f)/(-c*ln(f))^(1/2))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 332 vs. 2(64) = 128.
time = 0.41, size = 332, normalized size = 4.26

$$-\frac{\left(\frac{\sqrt{\pi}\,(2\,cx+b)b\left(\mathrm{erf}\left(\frac{1}{2}\sqrt{-\frac{(2\,cx+b)^2\log(f)}{c}}\right)-1\right)\log(f)^2}{\sqrt{-\frac{(2\,cx+b)^2\log(f)}{c}}\,(c\log(f))^{\frac{3}{2}}} - \frac{2\,cf^{\frac{(2\,cx+b)^2}{4\,c}}\log(f)}{(c\log(f))^{\frac{3}{2}}}\right)bcf^{a-\frac{b^2}{4\,c}}}{\sqrt{c\log(f)}} + \frac{\left(\frac{\sqrt{\pi}\,(2\,cx+b)b^2\left(\mathrm{erf}\left(\frac{1}{2}\sqrt{-\frac{(2\,cx+b)^2\log(f)}{c}}\right)-1\right)\log(f)^3}{\sqrt{-\frac{(2\,cx+b)^2\log(f)}{c}}\,(c\log(f))^{\frac{5}{2}}} - \frac{4\,(2\,cx+b)^3\Gamma\left(\frac{3}{2},-\frac{(2\,cx+b)^2\log(f)}{4\,c}\right)\log(f)^3}{\left(-\frac{(2\,cx+b)^2\log(f)}{c}\right)^{\frac{3}{2}}(c\log(f))^{\frac{5}{2}}} - \frac{4\,bcf^{\frac{(2\,cx+b)^2}{4\,c}}\log(f)^2}{(c\log(f))^{\frac{5}{2}}}\right)c^2 f^{a-\frac{b^2}{4\,c}}}{2\sqrt{c\log(f)}} + \frac{\sqrt{\pi}\,b^2 f^a\,\mathrm{erf}\left(\sqrt{-c\log(f)}\,x - \frac{b\log(f)}{2\sqrt{-c\log(f)}}\right)}{2\sqrt{-c\log(f)}\,f^{\frac{b^2}{4\,c}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(2*c*x+b)^2,x, algorithm="maxima")
```

```
[Out] -(sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) - 1)*log(f
)^2/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(3/2)) - 2*c*f^(1/4*(2*c*x +
b)^2/c)*log(f)/(c*log(f))^(3/2))*b*c*f^(a - 1/4*b^2/c)/sqrt(c*log(f)) + 1/2
*(sqrt(pi)*(2*c*x + b)*b^2*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) - 1)*log
(f)^3/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(5/2)) - 4*(2*c*x + b)^3*ga
mma(3/2, -1/4*(2*c*x + b)^2*log(f)/c)*log(f)^3/((-(2*c*x + b)^2*log(f)/c)^(
3/2)*(c*log(f))^(5/2)) - 4*b*c*f^(1/4*(2*c*x + b)^2/c)*log(f)^2/(c*log(f))^
(5/2))*c^2*f^(a - 1/4*b^2/c)/sqrt(c*log(f)) + 1/2*sqrt(pi)*b^2*f^a*erf(sqrt
(-c*log(f))*x - 1/2*b*log(f)/sqrt(-c*log(f)))/(sqrt(-c*log(f))*f^(1/4*b^2/c
))
```

Fricas [A]
time = 0.36, size = 74, normalized size = 0.95

$$\frac{(2\,cx+b)f^{cx^2+bx+a}\log\left(f\right)+\frac{\sqrt{\pi}\,\sqrt{-c\log\left(f\right)}\,\operatorname{erf}\left(\frac{(2\,cx+b)\,\sqrt{-c\log\left(f\right)}}{2\,c}\right)}{f^{\frac{b^2-4\,ac}{4\,c}}}}{\log\left(f\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(2*c*x+b)^2,x, algorithm="fricas")
```

```
[Out] ((2*c*x + b)*f^(c*x^2 + b*x + a)*log(f) + sqrt(pi)*sqrt(-c*log(f))*erf(1/2*
(2*c*x + b)*sqrt(-c*log(f))/c)/f^(1/4*(b^2 - 4*a*c)/c))/log(f)^2
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx+cx^2}\left(b+2cx\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)*(2*c*x+b)**2,x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)*(b + 2*c*x)**2, x)
```

Giac [A]
time = 2.63, size = 88, normalized size = 1.13

$$\frac{c\left(2\,x+\frac{b}{c}\right)e^{\left(cx^2\log\left(f\right)+bx\log\left(f\right)+a\log\left(f\right)\right)}}{\log\left(f\right)}+\frac{\sqrt{\pi}\,c\operatorname{erf}\left(-\frac{1}{2}\,\sqrt{-c\log\left(f\right)}\,\left(2\,x+\frac{b}{c}\right)\right)e^{\left(-\frac{b^2\log\left(f\right)-4\,ac\log\left(f\right)}{4\,c}\right)}}{\sqrt{-c\log\left(f\right)}\,\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(2*c*x+b)^2,x, algorithm="giac")
```

```
[Out] c*(2*x + b/c)*e^(c*x^2*log(f) + b*x*log(f) + a*log(f))/log(f) + sqrt(pi)*c*
erf(-1/2*sqrt(-c*log(f))*(2*x + b/c))*e^(-1/4*(b^2*log(f) - 4*a*c*log(f))/c
)/(sqrt(-c*log(f))*log(f))
```

Mupad [B]
time = 3.79, size = 92, normalized size = 1.18

$$\frac{b\,f^a\,f^{c\,x^2}\,f^{b\,x}}{\ln\left(f\right)}-\frac{c\,f^{a-\frac{b^2}{4\,c}}\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\frac{b\,\ln(f)}{2}+c\,x\,\ln(f)}{\sqrt{c\,\ln\left(f\right)}}\right)}{\ln\left(f\right)\,\sqrt{c\,\ln\left(f\right)}}+\frac{2\,c\,f^a\,f^{c\,x^2}\,f^{b\,x}\,x}{\ln\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)*(b + 2*c*x)^2,x)
```

```
[Out] (b*f^a*f^(c*x^2)*f^(b*x))/log(f) - (c*f^(a - b^2/(4*c))*pi^(1/2)*erfi(((b*l
og(f))/2 + c*x*log(f))/(c*log(f))^(1/2)))/(log(f)*(c*log(f))^(1/2)) + (2*c*
f^a*f^(c*x^2)*f^(b*x)*x)/log(f)
```

3.452 $\int f^{a+bx+cx^2}(b+2cx)\,dx$

Optimal. Leaf size=17

$$\frac{f^{a+bx+cx^2}}{\log(f)}$$

```
[Out] f^(c*x^2+b*x+a)/ln(f)
```

Rubi [A]
time = 0.01, antiderivative size = 17, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.053$, Rules used = $\{2268\}$

$$\frac{f^{a+bx+cx^2}}{\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)*(b + 2*c*x),x]
```

```
[Out] f^(a + b*x + c*x^2)/Log[f]
```

Rule 2268

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[e*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] /; FreeQ[{F, a, b, c, d,
 e}, x] && EqQ[b*e - 2*c*d, 0]
```

Rubi steps

$$\int f^{a+bx+cx^2}(b+2cx)\,dx = \frac{f^{a+bx+cx^2}}{\log(f)}$$

Mathematica [A]
time = 0.06, size = 17, normalized size = 1.00

$$\frac{f^{a+bx+cx^2}}{\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)*(b + 2*c*x),x]
```

```
[Out] f^(a + b*x + c*x^2)/Log[f]
```

Maple [A]
time = 0.01, size = 18, normalized size = 1.06

method	result	size
gosper	$\frac{f^{c\,x^2+bx+a}}{\ln(f)}$	18
derivativedivides	$\frac{f^{c\,x^2+bx+a}}{\ln(f)}$	18
default	$\frac{f^{c\,x^2+bx+a}}{\ln(f)}$	18
risch	$\frac{f^{c\,x^2+bx+a}}{\ln(f)}$	18
norman	$\frac{\mathrm{e}^{\left(c\,x^2+bx+a\right)\ln(f)}}{\ln(f)}$	20

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)*(2*c*x+b),x,method=_RETURNVERBOSE)
[Out] f^(c*x^2+b*x+a)/ln(f)
```

Maxima [A]
time = 0.28, size = 17, normalized size = 1.00

$$\frac{f^{cx^2+bx+a}}{\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(2*c*x+b),x, algorithm="maxima")
[Out] f^(c*x^2 + b*x + a)/log(f)
```

Fricas [A]
time = 0.42, size = 17, normalized size = 1.00

$$\frac{f^{cx^2+bx+a}}{\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(2*c*x+b),x, algorithm="fricas")
[Out] f^(c*x^2 + b*x + a)/log(f)
```

Sympy [A]
time = 0.04, size = 24, normalized size = 1.41

$$\begin{cases} \frac{f^{a+bx+cx^2}}{\log(f)} & \text{for}\ \log(f) \neq 0 \\ bx + cx^2 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)*(2*c*x+b),x)
```

```
[Out] Piecewise((f**(a + b*x + c*x**2)/log(f), Ne(log(f), 0)), (b*x + c*x**2, Tru
e))
```

Giac [A]
time = 2.43, size = 17, normalized size = 1.00

$$\frac{f^{cx^2+bx+a}}{\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(2*c*x+b),x, algorithm="giac")
```

```
[Out] f^(c*x^2 + b*x + a)/log(f)
```

Mupad [B]
time = 3.62, size = 17, normalized size = 1.00

$$\frac{f^{c\,x^2+b\,x+a}}{\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)*(b + 2*c*x),x)
```

```
[Out] f^(a + b*x + c*x^2)/log(f)
```

3.453 $\int \frac{f^{a+bx+cx^2}}{b+2cx}\,dx$

Optimal. Leaf size=39

$$\frac{f^{a-\frac{b^2}{4c}}\operatorname{Ei}\left(\frac{(b+2cx)^2\log(f)}{4c}\right)}{4c}$$

```
[Out] 1/4*f^(a-1/4*b^2/c)*Ei(1/4*(2*c*x+b)^2*ln(f)/c)/c
```

Rubi [A]
time = 0.02, antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {2270}

$$\frac{f^{a-\frac{b^2}{4c}}\operatorname{Ei}\left(\frac{(b+2cx)^2\log(f)}{4c}\right)}{4c}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)/(b + 2*c*x),x]
```

```
[Out] (f^(a - b^2/(4*c))*ExpIntegralEi[((b + 2*c*x)^2*Log[f])/(4*c)])/(4*c)
```

Rule 2270

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)/((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(1/(2*e))*F^(a - b^2/(4*c))*ExpIntegralEi[(b + 2*c*x)^2*(Log[F]/(
4*c))], x] /; FreeQ[{F, a, b, c, d, e}, x] && EqQ[b*e - 2*c*d, 0]
```

Rubi steps

$$\int \frac{f^{a+bx+cx^2}}{b+2cx}\,dx = \frac{f^{a-\frac{b^2}{4c}}\operatorname{Ei}\left(\frac{(b+2cx)^2\log(f)}{4c}\right)}{4c}$$

Mathematica [A]
time = 0.18, size = 39, normalized size = 1.00

$$\frac{f^{a-\frac{b^2}{4c}}\operatorname{Ei}\left(\frac{(b+2cx)^2\log(f)}{4c}\right)}{4c}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)/(b + 2*c*x),x]
```

[Out] (f^(a - b^2/(4*c))*ExpIntegralEi[((b + 2*c*x)^2*Log[f])/(4*c)])/(4*c)

Maple [A]
time = 0.07, size = 40, normalized size = 1.03

method	result	size
risch	$-\frac{f^{\frac{4ca-b^2}{4c}} \operatorname{expIntegral}\left(1,-\frac{(2cx+b)^2 \ln(f)}{4c}\right)}{4c}$	40

Verification of antiderivative is not currently implemented for this CAS.

[In] int(f^(c*x^2+b*x+a)/(2*c*x+b),x,method=_RETURNVERBOSE)

[Out] -1/4/c*f^(1/4*(4*a*c-b^2)/c)*Ei(1,-1/4*(2*c*x+b)^2*ln(f)/c)

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(c*x^2+b*x+a)/(2*c*x+b),x, algorithm="maxima")

[Out] integrate(f^(c*x^2 + b*x + a)/(2*c*x + b), x)

Fricas [A]
time = 0.37, size = 47, normalized size = 1.21

$$\frac{\operatorname{Ei}\left(\frac{(4\,c^2x^2+4\,bcx+b^2)\log(f)}{4\,c}\right)}{4\,cf^{\frac{b^2-4\,ac}{4\,c}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(c*x^2+b*x+a)/(2*c*x+b),x, algorithm="fricas")

[Out] 1/4*Ei(1/4*(4*c^2*x^2 + 4*b*c*x + b^2)*log(f)/c)/(c*f^(1/4*(b^2 - 4*a*c)/c)
)

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx+cx^2}}{b+2cx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f**(c*x**2+b*x+a)/(2*c*x+b),x)

```
[Out] Integral(f**(a + b*x + c*x**2)/(b + 2*c*x), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(2*c*x+b),x, algorithm="giac")
[Out] integrate(f^(c*x^2 + b*x + a)/(2*c*x + b), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{f^{c\,x^2+b\,x+a}}{b+2\,c\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)/(b + 2*c*x),x)
[Out] int(f^(a + b*x + c*x^2)/(b + 2*c*x), x)
```

3.454 $\int \frac{f^{a+bx+cx^2}}{(b+2cx)^2}\,dx$

Optimal. Leaf size=84

$$-\frac{f^{a+bx+cx^2}}{2c(b+2cx)}+\frac{f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)\sqrt{\log(f)}}{4c^{3/2}}$$

```
[Out] -1/2*f^(c*x^2+b*x+a)/c/(2*c*x+b)+1/4*f^(a-1/4*b^2/c)*erfi(1/2*(2*c*x+b)*ln(
f)^(1/2)/c^(1/2))*Pi^(1/2)*ln(f)^(1/2)/c^(3/2)
```

Rubi [A]
time = 0.04, antiderivative size = 84, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {2271, 2266, 2235}

$$\frac{\sqrt{\pi}\sqrt{\log(f)}\,f^{a-\frac{b^2}{4c}}\,\mathrm{Erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{4c^{3/2}}-\frac{f^{a+bx+cx^2}}{2c(b+2cx)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)/(b + 2*c*x)^2,x]
```

```
[Out] -1/2*f^(a + b*x + c*x^2)/(c*(b + 2*c*x)) + (f^(a - b^2/(4*c))*Sqrt[Pi]*Erfi
[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])]*Sqrt[Log[f]])/(4*c^(3/2))
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2271

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*(F^(a + b*x + c*x^2)/(e*(m + 1))), x] - Di
st[2*c*(Log[F]/(e^2*(m + 1))), Int[(d + e*x)^(m + 2)*F^(a + b*x + c*x^2), x
], x] /; FreeQ[{F, a, b, c, d, e}, x] && EqQ[b*e - 2*c*d, 0] && LtQ[m, -1]
```

Rubi steps

$$\int \frac{f^{a+bx+cx^2}}{(b+2cx)^2}\,dx = -\frac{f^{a+bx+cx^2}}{2c(b+2cx)} + \frac{\log(f)\int f^{a+bx+cx^2}\,dx}{2c}$$
$$= -\frac{f^{a+bx+cx^2}}{2c(b+2cx)} + \frac{\left(f^{a-\frac{b^2}{4c}}\log(f)\right)\int f^{\frac{(b+2cx)^2}{4c}}\,dx}{2c}$$
$$= -\frac{f^{a+bx+cx^2}}{2c(b+2cx)} + \frac{f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)\sqrt{\log(f)}}{4c^{3/2}}$$

Mathematica [**A**]
time = 0.71, size = 96, normalized size = 1.14

$$\frac{f^{a-\frac{b^2}{4c}}\left(-2\sqrt{c}\,f^{\frac{(b+2cx)^2}{4c}} + \sqrt{\pi}\,(b+2cx)\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)\sqrt{\log(f)}\right)}{4c^{3/2}(b+2cx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)/(b + 2*c*x)^2,x]
```

```
[Out] (f^(a - b^2/(4*c))*(-2*Sqrt[c]*f^((b + 2*c*x)^2/(4*c)) + Sqrt[Pi]*(b + 2*c*
x)*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])]*Sqrt[Log[f]]))/(4*c^(3/2)*(
b + 2*c*x))
```

Maple [**A**]
time = 0.10, size = 101, normalized size = 1.20

method	result	size
risch	$-\frac{f^{\frac{(2cx+b)^2}{4c}} f^{\frac{4ca-b^2}{4c}}}{2c(2cx+b)} + \frac{\ln(f)\sqrt{\pi}\, f^{\frac{4ca-b^2}{4c}}\,\mathrm{erf}\left(\frac{\sqrt{-\frac{\ln(f)}{c}}\,(2cx+b)}{2}\right)}{4c^2\sqrt{-\frac{\ln(f)}{c}}}$	101

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)/(2*c*x+b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2/c/(2*c*x+b)*f^(1/4*(2*c*x+b)^2/c)*f^(1/4*(4*a*c-b^2)/c)+1/4/c^2*ln(f)*
Pi^(1/2)*f^(1/4*(4*a*c-b^2)/c)/(-ln(f)/c)^(1/2)*erf(1/2*(-ln(f)/c)^(1/2)*(2
*c*x+b))
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(2*c*x+b)^2,x, algorithm="maxima")
```

```
[Out] integrate(f^(c*x^2 + b*x + a)/(2*c*x + b)^2, x)
```

Fricas [A]
time = 0.37, size = 85, normalized size = 1.01

$$-\frac{2\,cf^{cx^2+bx+a}+\frac{\sqrt{\pi}\,(2\,cx+b)\sqrt{-c\log{(f)}}\,\operatorname{erf}\left(\frac{(2\,cx+b)\sqrt{-c\log{(f)}}}{2\,c}\right)}{f^{\frac{b^2-4\,ac}{4\,c}}}}{4\,(2\,c^3x+bc^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(2*c*x+b)^2,x, algorithm="fricas")
```

```
[Out] -1/4*(2*c*f^(c*x^2 + b*x + a) + sqrt(pi)*(2*c*x + b)*sqrt(-c*log(f))*erf(1/
2*(2*c*x + b)*sqrt(-c*log(f))/c)/f^(1/4*(b^2 - 4*a*c)/c))/(2*c^3*x + b*c^2)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{f^{a+bx+cx^2}}{(b+2cx)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)/(2*c*x+b)**2,x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)/(b + 2*c*x)**2, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(2*c*x+b)^2,x, algorithm="giac")
```

```
[Out] integrate(f^(c*x^2 + b*x + a)/(2*c*x + b)^2, x)
```

Mupad [B]
time = 4.14, size = 76, normalized size = 0.90

$$\frac{f^{a-\frac{b^2}{4\,c}}\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{\frac{b\,\ln(f)}{2}+c\,x\,\ln(f)}{\sqrt{c\,\ln(f)}}\right)\,\ln(f)}{4\,c\,\sqrt{c\,\ln(f)}}-\frac{f^a\,f^{c\,x^2}\,f^{b\,x}}{2\,c\,(b+2\,c\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)/(b + 2*c*x)^2,x)
```

```
[Out] (f^(a - b^2/(4*c))*pi^(1/2)*erfi(((b*log(f))/2 + c*x*log(f))/(c*log(f))^(1/
2))*log(f))/(4*c*(c*log(f))^(1/2)) - (f^a*f^(c*x^2)*f^(b*x))/(2*c*(b + 2*c*
x))
```

3.455 $\int \frac{f^{a+bx+cx^2}}{(b+2cx)^3} dx$

Optimal. Leaf size=69

$$-\frac{f^{a+bx+cx^2}}{4c(b+2cx)^2}+\frac{f^{a-\frac{b^2}{4c}}\text{Ei}\left(\frac{(b+2cx)^2\log(f)}{4c}\right)\log(f)}{16c^2}$$

```
[Out] -1/4*f^(c*x^2+b*x+a)/c/(2*c*x+b)^2+1/16*f^(a-1/4*b^2/c)*Ei(1/4*(2*c*x+b)^2*
ln(f)/c)*ln(f)/c^2
```

Rubi [A]
time = 0.05, antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2271, 2270}

$$\frac{\log(f)f^{a-\frac{b^2}{4c}}\text{Ei}\left(\frac{(b+2cx)^2\log(f)}{4c}\right)}{16c^2}-\frac{f^{a+bx+cx^2}}{4c(b+2cx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)/(b + 2*c*x)^3,x]
```

```
[Out] -1/4*f^(a + b*x + c*x^2)/(c*(b + 2*c*x)^2) + (f^(a - b^2/(4*c))*ExpIntegral
Ei[((b + 2*c*x)^2*Log[f])/(4*c)]*Log[f])/(16*c^2)
```

Rule 2270

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)/((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(1/(2*e))*F^(a - b^2/(4*c))*ExpIntegralEi[(b + 2*c*x)^2*(Log[F]/(
4*c))], x] /; FreeQ[{F, a, b, c, d, e}, x] && EqQ[b*e - 2*c*d, 0]
```

Rule 2271

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*(F^(a + b*x + c*x^2)/(e*(m + 1))), x] - Di
st[2*c*(Log[F]/(e^2*(m + 1))), Int[(d + e*x)^(m + 2)*F^(a + b*x + c*x^2), x
], x] /; FreeQ[{F, a, b, c, d, e}, x] && EqQ[b*e - 2*c*d, 0] && LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{f^{a+bx+cx^2}}{(b+2cx)^3} dx &= -\frac{f^{a+bx+cx^2}}{4c(b+2cx)^2}+\frac{\log(f)\int \frac{f^{a+bx+cx^2}}{b+2cx} dx}{4c}\\ &= -\frac{f^{a+bx+cx^2}}{4c(b+2cx)^2}+\frac{f^{a-\frac{b^2}{4c}}\text{Ei}\left(\frac{(b+2cx)^2\log(f)}{4c}\right)\log(f)}{16c^2}\end{aligned}$$

Mathematica [A]
time = 0.64, size = 79, normalized size = 1.14

$$\frac{f^{a-\frac{b^2}{4c}}\left(-4cf^{\frac{(b+2cx)^2}{4c}}+(b+2cx)^2\mathrm{Ei}\left(\frac{(b+2cx)^2\log(f)}{4c}\right)\log(f)\right)}{16c^2(b+2cx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)/(b + 2*c*x)^3,x]
```

```
[Out] (f^(a - b^2/(4*c))*(-4*c*f^((b + 2*c*x)^2/(4*c)) + (b + 2*c*x)^2*ExpIntegra
lEi[((b + 2*c*x)^2*Log[f])/(4*c)]*Log[f]))/(16*c^2*(b + 2*c*x)^2)
```

Maple [A]
time = 0.08, size = 88, normalized size = 1.28

method	result	size
risch	$-\frac{f^{\frac{(2cx+b)^2}{4c}}f^{\frac{4ca-b^2}{4c}}}{4c(2cx+b)^2}-\frac{\ln(f)f^{\frac{4ca-b^2}{4c}}\mathrm{expIntegral}\left(1,-\frac{(2cx+b)^2\ln(f)}{4c}\right)}{16c^2}$	88

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)/(2*c*x+b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/c/(2*c*x+b)^2*f^(1/4*(2*c*x+b)^2/c)*f^(1/4*(4*a*c-b^2)/c)-1/16/c^2*ln(
f)*f^(1/4*(4*a*c-b^2)/c)*Ei(1,-1/4*(2*c*x+b)^2*ln(f)/c)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(2*c*x+b)^3,x, algorithm="maxima")
```

```
[Out] integrate(f^(c*x^2 + b*x + a)/(2*c*x + b)^3, x)
```

Fricas [A]
time = 0.40, size = 106, normalized size = 1.54

$$-\frac{4\,cf^{cx^2+bx+a}-\frac{(4\,c^2x^2+4\,bcx+b^2)\mathrm{Ei}\left(\frac{(4\,c^2x^2+4\,bcx+b^2)\log(f)}{4\,c}\right)\log(f)}{f^{\frac{b^2-4\,ac}{4\,c}}}}{16\,(4\,c^4x^2+4\,bc^3x+b^2c^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(2*c*x+b)^3,x, algorithm="fricas")
```

```
[Out] -1/16*(4*c*f^(c*x^2 + b*x + a) - (4*c^2*x^2 + 4*b*c*x + b^2)*Ei(1/4*(4*c^2*
x^2 + 4*b*c*x + b^2)*log(f)/c)*log(f)/f^(1/4*(b^2 - 4*a*c)/c))/(4*c^4*x^2 +
 4*b*c^3*x + b^2*c^2)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx+cx^2}}{(b+2cx)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)/(2*c*x+b)**3,x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)/(b + 2*c*x)**3, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(2*c*x+b)^3,x, algorithm="giac")
```

```
[Out] integrate(f^(c*x^2 + b*x + a)/(2*c*x + b)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{f^{c\,x^2+b\,x+a}}{{\left(b+2\,c\,x\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)/(b + 2*c*x)^3,x)
```

```
[Out] int(f^(a + b*x + c*x^2)/(b + 2*c*x)^3, x)
```

3.456 $\int f^{bx+cx^2}(b+2cx)^3\,dx$

Optimal. Leaf size=43

$$-\frac{4cf^{bx+cx^2}}{\log^2(f)}+\frac{f^{bx+cx^2}(b+2cx)^2}{\log(f)}$$

```
[Out] -4*c*f^(c*x^2+b*x)/ln(f)^2+f^(c*x^2+b*x)*(2*c*x+b)^2/ln(f)
```

Rubi [A]
time = 0.03, antiderivative size = 43, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2269, 2268}

$$\frac{(b+2cx)^2f^{bx+cx^2}}{\log(f)}-\frac{4cf^{bx+cx^2}}{\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(b*x + c*x^2)*(b + 2*c*x)^3,x]
```

```
[Out] (-4*c*f^(b*x + c*x^2))/Log[f]^2 + (f^(b*x + c*x^2)*(b + 2*c*x)^2)/Log[f]
```

Rule 2268

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[e*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] /; FreeQ[{F, a, b, c, d,
 e}, x] && EqQ[b*e - 2*c*d, 0]
```

Rule 2269

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[e*(d + e*x)^(m - 1)*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] -
 Dist[(m - 1)*(e^2/(2*c*Log[F])), Int[(d + e*x)^(m - 2)*F^(a + b*x + c*x^2)
, x], x] /; FreeQ[{F, a, b, c, d, e}, x] && EqQ[b*e - 2*c*d, 0] && GtQ[m, 1
]
```

Rubi steps

$$\begin{aligned}\int f^{bx+cx^2}(b+2cx)^3\,dx &= \frac{f^{bx+cx^2}(b+2cx)^2}{\log(f)}-\frac{(4c)\int f^{bx+cx^2}(b+2cx)\,dx}{\log(f)}\\ &= -\frac{4cf^{bx+cx^2}}{\log^2(f)}+\frac{f^{bx+cx^2}(b+2cx)^2}{\log(f)}\end{aligned}$$

Mathematica [A]
time = 0.22, size = 29, normalized size = 0.67

$$\frac{f^{x(b+cx)}(-4c+(b+2cx)^2\log(f))}{\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(b*x + c*x^2)*(b + 2*c*x)^3,x]
[Out] (f^(x*(b + c*x))*(-4*c + (b + 2*c*x)^2*Log[f]))/Log[f]^2
```

Maple [A]
time = 0.07, size = 42, normalized size = 0.98

method	result	size
risch	$\frac{(4\ln(f)c^2x^2+4bcx\ln(f)+\ln(f)b^2-4c)f^{x(cx+b)}}{\ln(f)^2}$	42
gosper	$\frac{(4\ln(f)c^2x^2+4bcx\ln(f)+\ln(f)b^2-4c)f^{c\,x^2+bx}}{\ln(f)^2}$	44
norman	$\frac{(\ln(f)b^2-4c)\mathrm{e}^{\left(c\,x^2+bx\right)\ln(f)}}{\ln(f)^2}+\frac{4c^2x^2\mathrm{e}^{\left(c\,x^2+bx\right)\ln(f)}}{\ln(f)}+\frac{4cbx\,\mathrm{e}^{\left(c\,x^2+bx\right)\ln(f)}}{\ln(f)}$	77

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x)*(2*c*x+b)^3,x,method=_RETURNVERBOSE)
[Out] (4*ln(f)*c^2*x^2+4*b*c*x*ln(f)+ln(f)*b^2-4*c)/ln(f)^2*f^(x*(c*x+b))
```

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 0.46, size = 536, normalized size = 12.47

$$\frac{\sqrt{\pi}\,b^3\,\mathrm{erf}\left(\sqrt{-c\log(f)}\,x-\frac{b\log(f)}{2\sqrt{-c\log(f)}}\right)}{2\sqrt{-c\log(f)}\,f^{\frac{b^2}{4c}}}-\frac{3\left(\frac{\sqrt{\pi}(2cx+b)b\left(\mathrm{erf}\left(\frac{1}{2}\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}\right)-1\right)\log(f)^2}{\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}(c\log(f))^{\frac{3}{2}}}-\frac{2cf^{\frac{(2cx+b)^2}{4c}}\log(f)}{(c\log(f))^{\frac{3}{2}}}\right)b^2c}{2\sqrt{c\log(f)}\,f^{\frac{b^2}{4c}}}+\frac{3\left(\frac{\sqrt{\pi}(2cx+b)b^2\left(\mathrm{erf}\left(\frac{1}{2}\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}\right)-1\right)\log(f)^3}{\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}(c\log(f))^{\frac{5}{2}}}-\frac{4(2cx+b)^3\Gamma\left(\frac{3}{2},-\frac{(2cx+b)^2\log(f)}{4c}\right)\log(f)^3}{\left(-\frac{(2cx+b)^2\log(f)}{c}\right)^{\frac{3}{2}}(c\log(f))^{\frac{5}{2}}}-\frac{4bcf^{\frac{(2cx+b)^2}{4c}}\log(f)^2}{(c\log(f))^{\frac{5}{2}}}\right)bc^2}{2\sqrt{c\log(f)}\,f^{\frac{b^2}{4c}}}-\frac{\left(\frac{\sqrt{\pi}(2cx+b)b^3\left(\mathrm{erf}\left(\frac{1}{2}\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}\right)-1\right)\log(f)^4}{\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}(c\log(f))^{\frac{7}{2}}}-\frac{12(2cx+b)^3b\Gamma\left(\frac{3}{2},-\frac{(2cx+b)^2\log(f)}{4c}\right)\log(f)^4}{\left(-\frac{(2cx+b)^2\log(f)}{c}\right)^{\frac{3}{2}}(c\log(f))^{\frac{7}{2}}}-\frac{6b^2cf^{\frac{(2cx+b)^2}{4c}}\log(f)^3}{(c\log(f))^{\frac{7}{2}}}+\frac{8c^2\Gamma\left(2,-\frac{(2cx+b)^2\log(f)}{4c}\right)\log(f)^2}{(c\log(f))^{\frac{7}{2}}}\right)c^3}{2\sqrt{c\log(f)}\,f^{\frac{b^2}{4c}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)*(2*c*x+b)^3,x, algorithm="maxima")
[Out] 1/2*sqrt(pi)*b^3*erf(sqrt(-c*log(f))*x - 1/2*b*log(f)/sqrt(-c*log(f)))/(sqr
t(-c*log(f))*f^(1/4*b^2/c)) - 3/2*(sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2
*c*x + b)^2*log(f)/c)) - 1)*log(f)^2/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(
f))^(3/2)) - 2*c*f^(1/4*(2*c*x + b)^2/c)*log(f)/(c*log(f))^(3/2))*b^2*c/(sq
rt(c*log(f))*f^(1/4*b^2/c)) + 3/2*(sqrt(pi)*(2*c*x + b)*b^2*(erf(1/2*sqrt(-
(2*c*x + b)^2*log(f)/c)) - 1)*log(f)^3/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*lo
g(f))^(5/2)) - 4*(2*c*x + b)^3*gamma(3/2, -1/4*(2*c*x + b)^2*log(f)/c)*log(
f)^3/((-(2*c*x + b)^2*log(f)/c)^(3/2)*(c*log(f))^(5/2)) - 4*b*c*f^(1/4*(2*c
*x + b)^2/c)*log(f)^2/(c*log(f))^(5/2))*b*c^2/(sqrt(c*log(f))*f^(1/4*b^2/c)
```

```
) - 1/2*(sqrt(pi)*(2*c*x + b)*b^3*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) -
 1)*log(f)^4/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(7/2)) - 12*(2*c*x +
 b)^3*b*gamma(3/2, -1/4*(2*c*x + b)^2*log(f)/c)*log(f)^4/((-(2*c*x + b)^2*l
og(f)/c)^(3/2)*(c*log(f))^(7/2)) - 6*b^2*c*f^(1/4*(2*c*x + b)^2/c)*log(f)^3
/(c*log(f))^(7/2) + 8*c^2*gamma(2, -1/4*(2*c*x + b)^2*log(f)/c)*log(f)^2/(c
*log(f))^(7/2))*c^3/(sqrt(c*log(f))*f^(1/4*b^2/c))
```

Fricas [A]
time = 0.37, size = 40, normalized size = 0.93

$$\frac{((4\,c^2x^2+4\,bcx+b^2)\log(f)-4\,c)f^{cx^2+bx}}{\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)*(2*c*x+b)^3,x, algorithm="fricas")
```

```
[Out] ((4*c^2*x^2 + 4*b*c*x + b^2)*log(f) - 4*c)*f^(c*x^2 + b*x)/log(f)^2
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 83 vs. 2(39) = 78.
time = 0.06, size = 83, normalized size = 1.93

$$\begin{cases} \frac{f^{bx+cx^2}(b^2\log(f)+4bcx\log(f)+4c^2x^2\log(f)-4c)}{\log(f)^2} & \text{for } \log(f)^2\neq 0 \\ b^3x+3b^2cx^2+4bc^2x^3+2c^3x^4 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x)*(2*c*x+b)**3,x)
```

```
[Out] Piecewise(((f**(b*x + c*x**2)*(b**2*log(f) + 4*b*c*x*log(f) + 4*c**2*x**2*lo
g(f) - 4*c)/log(f)**2, Ne(log(f)**2, 0)), (b**3*x + 3*b**2*c*x**2 + 4*b*c**
2*x**3 + 2*c**3*x**4, True))
```

Giac [C] Result contains complex when optimal does not.
time = 3.27, size = 742, normalized size = 17.26

$$\left(2\left(\frac{(b^2\log(|f|)+4(cx^2+bx)c\log(|f|)-4c)(\pi^2\mathrm{sgn}(f)-\pi^2+2\log(|f|)^2)}{(\pi^2\mathrm{sgn}(f)-\pi^2+2\log(|f|)^2)^2+4(\pi\log(|f|)\mathrm{sgn}(f)-\pi\log(|f|))^2}+\frac{(\pi b^2\mathrm{sgn}(f)+4\pi(cx^2+bx)c\,\mathrm{sgn}(f)-\pi b^2-4\pi(cx^2+bx)c)(\pi\log(|f|)\mathrm{sgn}(f)-\pi\log(|f|))}{(\pi^2\mathrm{sgn}(f)-\pi^2+2\log(|f|)^2)^2+4(\pi\log(|f|)\mathrm{sgn}(f)-\pi\log(|f|))^2}\right)\cos\left(-\frac{1}{2}\pi cx^2\mathrm{sgn}(f)+\frac{1}{2}\pi cx^2-\frac{1}{2}\pi bx\,\mathrm{sgn}(f)+\frac{1}{2}\pi bx\right)+\left(\frac{(\pi b^2\mathrm{sgn}(f)+4\pi(cx^2+bx)c\,\mathrm{sgn}(f)-\pi b^2-4\pi(cx^2+bx)c)(\pi^2\mathrm{sgn}(f)-\pi^2+2\log(|f|)^2)}{(\pi^2\mathrm{sgn}(f)-\pi^2+2\log(|f|)^2)^2+4(\pi\log(|f|)\mathrm{sgn}(f)-\pi\log(|f|))^2}-\frac{4(b^2\log(|f|)+4(cx^2+bx)c\log(|f|)-4c)(\pi\log(|f|)\mathrm{sgn}(f)-\pi\log(|f|))}{(\pi^2\mathrm{sgn}(f)-\pi^2+2\log(|f|)^2)^2+4(\pi\log(|f|)\mathrm{sgn}(f)-\pi\log(|f|))^2}\right)\sin\left(-\frac{1}{2}\pi cx^2\mathrm{sgn}(f)+\frac{1}{2}\pi cx^2-\frac{1}{2}\pi bx\,\mathrm{sgn}(f)+\frac{1}{2}\pi bx\right)\right)|f|^{cx^2+bx}-\frac{1}{2}i|f|^{cx^2+bx}\left(\frac{(\pi b^2\mathrm{sgn}(f)+4\pi(cx^2+bx)c\,\mathrm{sgn}(f)-\pi b^2-4\pi(cx^2+bx)c-2ib^2\log(|f|)+8(-icx^2-ibx)c\log(|f|)+8ic)e^{\left(\frac{1}{2}i\pi cx^2\mathrm{sgn}(f)-\frac{1}{2}i\pi cx^2+\frac{1}{2}i\pi bx\,\mathrm{sgn}(f)-\frac{1}{2}i\pi bx\right)}}{\pi^2\mathrm{sgn}(f)+2i\pi\log(|f|)\mathrm{sgn}(f)-\pi^2-2i\pi\log(|f|)+2\log(|f|)^2}+\frac{(\pi b^2\mathrm{sgn}(f)+4\pi(cx^2+bx)c\,\mathrm{sgn}(f)-\pi b^2-4\pi(cx^2+bx)c+2ib^2\log(|f|)-8(-icx^2-ibx)c\log(|f|)-8ic)e^{\left(-\frac{1}{2}i\pi cx^2\mathrm{sgn}(f)+\frac{1}{2}i\pi cx^2-\frac{1}{2}i\pi bx\,\mathrm{sgn}(f)+\frac{1}{2}i\pi bx\right)}}{\pi^2\mathrm{sgn}(f)-2i\pi\log(|f|)\mathrm{sgn}(f)-\pi^2+2i\pi\log(|f|)+2\log(|f|)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)*(2*c*x+b)^3,x, algorithm="giac")
```

```
[Out] (2*((b^2*log(abs(f)) + 4*(c*x^2 + b*x)*c*log(abs(f)) - 4*c)*(pi^2*sgn(f) -
pi^2 + 2*log(abs(f))^2)/((pi^2*sgn(f) - pi^2 + 2*log(abs(f))^2)^2 + 4*(pi*l
og(abs(f))*sgn(f) - pi*log(abs(f)))^2) + (pi*b^2*sgn(f) + 4*pi*(c*x^2 + b*x
)*c*sgn(f) - pi*b^2 - 4*pi*(c*x^2 + b*x)*c)*(pi*log(abs(f))*sgn(f) - pi*log
(abs(f)))/((pi^2*sgn(f) - pi^2 + 2*log(abs(f))^2)^2 + 4*(pi*log(abs(f))*sgn
```

```
(f) - pi*log(abs(f)))^2))*cos(-1/2*pi*c*x^2*sgn(f) + 1/2*pi*c*x^2 - 1/2*pi*
b*x*sgn(f) + 1/2*pi*b*x) + ((pi*b^2*sgn(f) + 4*pi*(c*x^2 + b*x)*c*sgn(f) -
pi*b^2 - 4*pi*(c*x^2 + b*x)*c)*(pi^2*sgn(f) - pi^2 + 2*log(abs(f))^2)/((pi^
2*sgn(f) - pi^2 + 2*log(abs(f))^2)^2 + 4*(pi*log(abs(f))*sgn(f) - pi*log(ab
s(f)))^2) - 4*(b^2*log(abs(f)) + 4*(c*x^2 + b*x)*c*log(abs(f)) - 4*c)*(pi*l
og(abs(f))*sgn(f) - pi*log(abs(f)))/((pi^2*sgn(f) - pi^2 + 2*log(abs(f))^2)
^2 + 4*(pi*log(abs(f))*sgn(f) - pi*log(abs(f)))^2))*sin(-1/2*pi*c*x^2*sgn(f
) + 1/2*pi*c*x^2 - 1/2*pi*b*x*sgn(f) + 1/2*pi*b*x))*abs(f)^(c*x^2 + b*x) -
1/2*I*abs(f)^(c*x^2 + b*x)*((pi*b^2*sgn(f) + 4*pi*(c*x^2 + b*x)*c*sgn(f) -
pi*b^2 - 4*pi*(c*x^2 + b*x)*c - 2*I*b^2*log(abs(f)) + 8*(-I*c*x^2 - I*b*x)*
c*log(abs(f)) + 8*I*c)*e^(1/2*I*pi*c*x^2*sgn(f) - 1/2*I*pi*c*x^2 + 1/2*I*pi
*b*x*sgn(f) - 1/2*I*pi*b*x)/(pi^2*sgn(f) + 2*I*pi*log(abs(f))*sgn(f) - pi^2
 - 2*I*pi*log(abs(f)) + 2*log(abs(f))^2) + (pi*b^2*sgn(f) + 4*pi*(c*x^2 + b
*x)*c*sgn(f) - pi*b^2 - 4*pi*(c*x^2 + b*x)*c + 2*I*b^2*log(abs(f)) - 8*(-I*
c*x^2 - I*b*x)*c*log(abs(f)) - 8*I*c)*e^(-1/2*I*pi*c*x^2*sgn(f) + 1/2*I*pi*
c*x^2 - 1/2*I*pi*b*x*sgn(f) + 1/2*I*pi*b*x)/(pi^2*sgn(f) - 2*I*pi*log(abs(f
))*sgn(f) - pi^2 + 2*I*pi*log(abs(f)) + 2*log(abs(f))^2))
```

Mupad [B]
time = 3.69, size = 43, normalized size = 1.00

$$\frac{f^{c\,x^2+b\,x}\,\left(\ln\left(f\right)\,b^2+4\,\ln\left(f\right)\,b\,c\,x+4\,\ln\left(f\right)\,c^2\,x^2-4\,c\right)}{{\ln\left(f\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x + c*x^2)*(b + 2*c*x)^3,x)
[Out] (f^(b*x + c*x^2)*(b^2*log(f) - 4*c + 4*c^2*x^2*log(f) + 4*b*c*x*log(f)))/lo
g(f)^2
```

3.457 $\int f^{bx+cx^2}(b+2cx)^2\,dx$

Optimal. Leaf size=75

$$-\frac{\sqrt{c}\,f^{-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{\log^{\frac{3}{2}}(f)}+\frac{f^{bx+cx^2}(b+2cx)}{\log(f)}$$

```
[Out] f^(c*x^2+b*x)*(2*c*x+b)/ln(f)-erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c^(1/2))*c^(1/
2)*Pi^(1/2)/(f^(1/4*b^2/c))/ln(f)^(3/2)
```

Rubi [A]
time = 0.04, antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {2269, 2266, 2235}

$$\frac{(b+2cx)f^{bx+cx^2}}{\log(f)}-\frac{\sqrt{\pi}\,\sqrt{c}\,f^{-\frac{b^2}{4c}}\mathrm{Erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{\log^{\frac{3}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(b*x + c*x^2)*(b + 2*c*x)^2,x]
```

```
[Out] -((Sqrt[c]*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/(f^(b^2/(
4*c))*Log[f]^(3/2))) + (f^(b*x + c*x^2)*(b + 2*c*x))/Log[f]
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2269

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[e*(d + e*x)^(m - 1)*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] -
 Dist[(m - 1)*(e^2/(2*c*Log[F])), Int[(d + e*x)^(m - 2)*F^(a + b*x + c*x^2)
, x], x] /; FreeQ[{F, a, b, c, d, e}, x] && EqQ[b*e - 2*c*d, 0] && GtQ[m, 1
]
```

Rubi steps

$$\begin{aligned}\int f^{bx+cx^2}(b+2cx)^2\,dx &= \frac{f^{bx+cx^2}(b+2cx)}{\log(f)}-\frac{(2c)\int f^{bx+cx^2}\,dx}{\log(f)}\\ &= \frac{f^{bx+cx^2}(b+2cx)}{\log(f)}-\frac{\left(2cf^{-\frac{b^2}{4c}}\right)\int f^{\frac{(b+2cx)^2}{4c}}\,dx}{\log(f)}\\ &= -\frac{\sqrt{c}\,f^{-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{\log^{\frac{3}{2}}(f)}+\frac{f^{bx+cx^2}(b+2cx)}{\log(f)}\end{aligned}$$

Mathematica [**A**]
time = 0.20, size = 84, normalized size = 1.12

$$\frac{f^{-\frac{b^2}{4c}}\left(-\sqrt{c}\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)+f^{\frac{(b+2cx)^2}{4c}}(b+2cx)\sqrt{\log(f)}\right)}{\log^{\frac{3}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(b*x + c*x^2)*(b + 2*c*x)^2,x]
```

```
[Out] (-(Sqrt[c]*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])]) + f^((b +
 2*c*x)^2/(4*c))*(b + 2*c*x)*Sqrt[Log[f]])/(f^(b^2/(4*c))*Log[f]^(3/2))
```

Maple [**A**]
time = 0.08, size = 90, normalized size = 1.20

method	result	size
risch	$\frac{2cx\,f^{c\,x^2}f^{bx}}{\ln(f)}+\frac{b\,f^{c\,x^2}f^{bx}}{\ln(f)}+\frac{c\sqrt{\pi}\,f^{-\frac{b^2}{4c}}\,\mathrm{erf}\left(-\sqrt{-c\ln(f)}\,x+\frac{b\ln(f)}{2\sqrt{-c\ln(f)}}\right)}{\ln(f)\sqrt{-c\ln(f)}}$	90

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x)*(2*c*x+b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 2*c/ln(f)*x*f^(c*x^2)*f^(b*x)+b/ln(f)*f^(c*x^2)*f^(b*x)+c/ln(f)*Pi^(1/2)*f^
(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(-(-c*ln(f))^(1/2)*x+1/2*b*ln(f)/(-c*ln(f)
)^(1/2))
```

Maxima [**B**] Leaf count of result is larger than twice the leaf count of optimal. 329 vs. 2(63) = 126.
time = 0.39, size = 329, normalized size = 4.39

$$\frac{\sqrt{\pi}\,b^2\,\mathrm{erf}\left(\sqrt{-c\log(f)}\,x-\frac{b\log(f)}{2\sqrt{-c\log(f)}}\right)}{2\sqrt{-c\log(f)}\,f^{\frac{b^2}{4c}}}-\frac{\left(\frac{\sqrt{\pi}(2cx+b)b\left(\mathrm{erf}\left(\frac{1}{2}\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}\right)-1\right)\log(f)^2}{\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}\,(c\log(f))^{\frac{3}{2}}}-\frac{2cf^{\frac{(2cx+b)^2}{4c}}\log(f)}{(c\log(f))^{\frac{3}{2}}}\right)bc}{\sqrt{c\log(f)}\,f^{\frac{b^2}{4c}}}+\frac{\left(\frac{\sqrt{\pi}(2cx+b)b^2\left(\mathrm{erf}\left(\frac{1}{2}\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}\right)-1\right)\log(f)^3}{\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}\,(c\log(f))^{\frac{5}{2}}}-\frac{4(2cx+b)^3\Gamma\left(\frac{3}{2},-\frac{(2cx+b)^2\log(f)}{4c}\right)\log(f)^3}{\left(-\frac{(2cx+b)^2\log(f)}{c}\right)^{\frac{3}{2}}(c\log(f))^{\frac{5}{2}}}-\frac{4bcf^{\frac{(2cx+b)^2}{4c}}\log(f)^2}{(c\log(f))^{\frac{5}{2}}}\right)c^2}{2\sqrt{c\log(f)}\,f^{\frac{b^2}{4c}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)*(2*c*x+b)^2,x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(pi)*b^2*erf(sqrt(-c*log(f))*x - 1/2*b*log(f)/sqrt(-c*log(f)))/(sqr
t(-c*log(f))*f^(1/4*b^2/c)) - (sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x
 + b)^2*log(f)/c)) - 1)*log(f)^2/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^
(3/2)) - 2*c*f^(1/4*(2*c*x + b)^2/c)*log(f)/(c*log(f))^(3/2))*b*c/(sqrt(c*l
og(f))*f^(1/4*b^2/c)) + 1/2*(sqrt(pi)*(2*c*x + b)*b^2*(erf(1/2*sqrt(-(2*c*x
 + b)^2*log(f)/c)) - 1)*log(f)^3/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^
(5/2)) - 4*(2*c*x + b)^3*gamma(3/2, -1/4*(2*c*x + b)^2*log(f)/c)*log(f)^3/(
(-(2*c*x + b)^2*log(f)/c)^(3/2)*(c*log(f))^(5/2)) - 4*b*c*f^(1/4*(2*c*x + b
)^2/c)*log(f)^2/(c*log(f))^(5/2))*c^2/(sqrt(c*log(f))*f^(1/4*b^2/c))
```

Fricas [A]
time = 0.38, size = 68, normalized size = 0.91

$$\frac{(2\,cx+b)f^{cx^2+bx}\log\left(f\right)+\frac{\sqrt{\pi}\,\sqrt{-c\log\left(f\right)}\,\operatorname{erf}\left(\frac{(2\,cx+b)\,\sqrt{-c\log\left(f\right)}}{2\,c}\right)}{f^{\frac{b^2}{4\,c}}}}{\log\left(f\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)*(2*c*x+b)^2,x, algorithm="fricas")
```

```
[Out] ((2*c*x + b)*f^(c*x^2 + b*x)*log(f) + sqrt(pi)*sqrt(-c*log(f))*erf(1/2*(2*c
*x + b)*sqrt(-c*log(f))/c)/f^(1/4*b^2/c))/log(f)^2
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{bx+cx^2}(b+2cx)^2\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x)*(2*c*x+b)**2,x)
```

```
[Out] Integral(f**(b*x + c*x**2)*(b + 2*c*x)**2, x)
```

Giac [A]
time = 2.74, size = 77, normalized size = 1.03

$$\frac{c\left(2\,x+\frac{b}{c}\right)e^{\left(cx^2\log\left(f\right)+bx\log\left(f\right)\right)}}{\log\left(f\right)}+\frac{\sqrt{\pi}\,c\operatorname{erf}\left(-\frac{1}{2}\,\sqrt{-c\log\left(f\right)}\,\left(2\,x+\frac{b}{c}\right)\right)}{\sqrt{-c\log\left(f\right)}\,f^{\frac{b^2}{4\,c}}\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)*(2*c*x+b)^2,x, algorithm="giac")
```

```
[Out] c*(2*x + b/c)*e^(c*x^2*log(f) + b*x*log(f))/log(f) + sqrt(pi)*c*erf(-1/2*sq
rt(-c*log(f))*(2*x + b/c))/(sqrt(-c*log(f))*f^(1/4*b^2/c)*log(f))
```

Mupad [B]
time = 3.65, size = 86, normalized size = 1.15

$$\frac{b f^{c x^2} f^{b x}}{\ln(f)}+\frac{2 c f^{c x^2} f^{b x} x}{\ln(f)}-\frac{c \sqrt{\pi}\, \operatorname{erfi}\left(\frac{\frac{b \ln(f)}{2}+c x \ln(f)}{\sqrt{c \ln(f)}}\right)}{f^{\frac{b^2}{4 c}} \ln(f)\, \sqrt{c \ln(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x + c*x^2)*(b + 2*c*x)^2,x)
```

```
[Out] (b*f^(c*x^2)*f^(b*x))/log(f) + (2*c*f^(c*x^2)*f^(b*x)*x)/log(f) - (c*pi^(1/
2)*erfi(((b*log(f))/2 + c*x*log(f))/(c*log(f))^(1/2)))/(f^(b^2/(4*c))*log(f
)*(c*log(f))^(1/2))
```

3.458 $\int f^{bx+cx^2}(b+2cx)\,dx$

Optimal. Leaf size=16

$$\frac{f^{bx+cx^2}}{\log(f)}$$

```
[Out] f^(c*x^2+b*x)/ln(f)
```

Rubi [A]
time = 0.01, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.056$, Rules used = {2268}

$$\frac{f^{bx+cx^2}}{\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(b*x + c*x^2)*(b + 2*c*x),x]
```

```
[Out] f^(b*x + c*x^2)/Log[f]
```

Rule 2268

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[e*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] /; FreeQ[{F, a, b, c, d,
 e}, x] && EqQ[b*e - 2*c*d, 0]
```

Rubi steps

$$\int f^{bx+cx^2}(b+2cx)\,dx = \frac{f^{bx+cx^2}}{\log(f)}$$

Mathematica [A]
time = 0.02, size = 16, normalized size = 1.00

$$\frac{f^{bx+cx^2}}{\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(b*x + c*x^2)*(b + 2*c*x),x]
```

```
[Out] f^(b*x + c*x^2)/Log[f]
```

Maple [A]
time = 0.01, size = 17, normalized size = 1.06

method	result	size
risch	$\frac{f^{x(cx+b)}}{\ln(f)}$	15
gosper	$\frac{f^{c\,x^{2}+bx}}{\ln(f)}$	17
derivativedivides	$\frac{f^{c\,x^{2}+bx}}{\ln(f)}$	17
default	$\frac{f^{c\,x^{2}+bx}}{\ln(f)}$	17
norman	$\frac{{\mathrm e}^{\left(c\,x^{2}+bx\right)\ln(f)}}{\ln(f)}$	19

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x)*(2*c*x+b),x,method=_RETURNVERBOSE)
[Out] f^(c*x^2+b*x)/ln(f)
```

Maxima [A]
time = 0.27, size = 16, normalized size = 1.00

$$\frac{f^{cx^2+bx}}{\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)*(2*c*x+b),x, algorithm="maxima")
[Out] f^(c*x^2 + b*x)/log(f)
```

Fricas [A]
time = 0.36, size = 16, normalized size = 1.00

$$\frac{f^{cx^2+bx}}{\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)*(2*c*x+b),x, algorithm="fricas")
[Out] f^(c*x^2 + b*x)/log(f)
```

Sympy [A]
time = 0.04, size = 22, normalized size = 1.38

$$\begin{cases} \frac{f^{bx+cx^2}}{\log(f)} & \text{for}\ \log(f) \neq 0 \\ bx + cx^2 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x)*(2*c*x+b),x)
```

```
[Out] Piecewise((f**(b*x + c*x**2)/log(f), Ne(log(f), 0)), (b*x + c*x**2, True))
```

Giac [A]
time = 3.07, size = 16, normalized size = 1.00

$$\frac{f^{cx^2+bx}}{\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)*(2*c*x+b),x, algorithm="giac")
```

```
[Out] f^(c*x^2 + b*x)/log(f)
```

Mupad [B]
time = 3.52, size = 16, normalized size = 1.00

$$\frac{f^{c\,x^2+b\,x}}{\ln\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x + c*x^2)*(b + 2*c*x),x)
```

```
[Out] f^(b*x + c*x^2)/log(f)
```

3.459 $\int \frac{f^{bx+cx^2}}{b+2cx}\,dx$

Optimal. Leaf size=37

$$\frac{f^{-\frac{b^2}{4c}}\operatorname{Ei}\left(\frac{(b+2cx)^2\log(f)}{4c}\right)}{4c}$$

```
[Out] 1/4*Ei(1/4*(2*c*x+b)^2*ln(f)/c)/c/(f^(1/4*b^2/c))
```

Rubi [A]
time = 0.02, antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.050$, Rules used = {2270}

$$\frac{f^{-\frac{b^2}{4c}}\operatorname{Ei}\left(\frac{(b+2cx)^2\log(f)}{4c}\right)}{4c}$$

Antiderivative was successfully verified.

```
[In] Int[f^(b*x + c*x^2)/(b + 2*c*x),x]
```

```
[Out] ExpIntegralEi[((b + 2*c*x)^2*Log[f])/(4*c)]/(4*c*f^(b^2/(4*c)))
```

Rule 2270

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)/((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(1/(2*e))*F^(a - b^2/(4*c))*ExpIntegralEi[(b + 2*c*x)^2*(Log[F]/(
4*c))], x] /; FreeQ[{F, a, b, c, d, e}, x] && EqQ[b*e - 2*c*d, 0]
```

Rubi steps

$$\int \frac{f^{bx+cx^2}}{b+2cx}\,dx = \frac{f^{-\frac{b^2}{4c}}\operatorname{Ei}\left(\frac{(b+2cx)^2\log(f)}{4c}\right)}{4c}$$

Mathematica [A]
time = 0.05, size = 37, normalized size = 1.00

$$\frac{f^{-\frac{b^2}{4c}}\operatorname{Ei}\left(\frac{(b+2cx)^2\log(f)}{4c}\right)}{4c}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(b*x + c*x^2)/(b + 2*c*x),x]
```

[Out] ExpIntegralEi[((b + 2*c*x)^2*Log[f])/(4*c)]/(4*c*f^(b^2/(4*c)))

Maple [A]
time = 0.09, size = 33, normalized size = 0.89

method	result	size
risch	$-\frac{f^{-\frac{b^{2}}{4c}} \operatorname{expIntegral}\left(1, -\frac{(2cx+b)^{2} \ln(f)}{4c}\right)}{4c}$	33

Verification of antiderivative is not currently implemented for this CAS.

[In] int(f^(c*x^2+b*x)/(2*c*x+b),x,method=_RETURNVERBOSE)

[Out] -1/4/c*f^(-1/4*b^2/c)*Ei(1,-1/4*(2*c*x+b)^2*ln(f)/c)

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(c*x^2+b*x)/(2*c*x+b),x, algorithm="maxima")

[Out] integrate(f^(c*x^2 + b*x)/(2*c*x + b), x)

Fricas [A]
time = 0.36, size = 42, normalized size = 1.14

$$\frac{\operatorname{Ei}\left(\frac{(4\,c^2x^2+4\,bcx+b^2)\log(f)}{4\,c}\right)}{4\,cf^{\frac{b^2}{4\,c}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(c*x^2+b*x)/(2*c*x+b),x, algorithm="fricas")

[Out] 1/4*Ei(1/4*(4*c^2*x^2 + 4*b*c*x + b^2)*log(f)/c)/(c*f^(1/4*b^2/c))

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx+cx^2}}{b+2cx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f**(c*x**2+b*x)/(2*c*x+b),x)

[Out] Integral(f**(b*x + c*x**2)/(b + 2*c*x), x)

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)/(2*c*x+b),x, algorithm="giac")
[Out] integrate(f^(c*x^2 + b*x)/(2*c*x + b), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{f^{c\,x^2+b\,x}}{b+2\,c\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x + c*x^2)/(b + 2*c*x),x)
[Out] int(f^(b*x + c*x^2)/(b + 2*c*x), x)
```

3.460 $\int \frac{f^{bx+cx^2}}{(b+2cx)^2} dx$

Optimal. Leaf size=81

$$-\frac{f^{bx+cx^2}}{2c(b+2cx)}+\frac{f^{-\frac{b^2}{4c}}\sqrt{\pi}\,\text{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)\sqrt{\log(f)}}{4c^{3/2}}$$

```
[Out] -1/2*f^(c*x^2+b*x)/c/(2*c*x+b)+1/4*erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c^(1/2))*
Pi^(1/2)*ln(f)^(1/2)/c^(3/2)/(f^(1/4*b^2/c))
```

Rubi [A]
time = 0.03, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.150$, Rules used = {2271, 2266, 2235}

$$\frac{\sqrt{\pi}\sqrt{\log(f)}\,f^{-\frac{b^2}{4c}}\text{Erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{4c^{3/2}}-\frac{f^{bx+cx^2}}{2c(b+2cx)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(b*x + c*x^2)/(b + 2*c*x)^2,x]
```

```
[Out] -1/2*f^(b*x + c*x^2)/(c*(b + 2*c*x)) + (Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log
[f]])/(2*Sqrt[c])]*Sqrt[Log[f]])/(4*c^(3/2)*f^(b^2/(4*c)))
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2271

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*(F^(a + b*x + c*x^2)/(e*(m + 1))), x] - Di
st[2*c*(Log[F]/(e^2*(m + 1))), Int[(d + e*x)^(m + 2)*F^(a + b*x + c*x^2), x
], x] /; FreeQ[{F, a, b, c, d, e}, x] && EqQ[b*e - 2*c*d, 0] && LtQ[m, -1]
```

Rubi steps

$$\int \frac{f^{bx+cx^2}}{(b+2cx)^2}\,dx = -\frac{f^{bx+cx^2}}{2c(b+2cx)} + \frac{\log(f)\int f^{bx+cx^2}\,dx}{2c}$$
$$= -\frac{f^{bx+cx^2}}{2c(b+2cx)} + \frac{\left(f^{-\frac{b^2}{4c}}\log(f)\right)\int f^{\frac{(b+2cx)^2}{4c}}\,dx}{2c}$$
$$= -\frac{f^{bx+cx^2}}{2c(b+2cx)} + \frac{f^{-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)\sqrt{\log(f)}}{4c^{3/2}}$$

Mathematica [A]
time = 0.21, size = 94, normalized size = 1.16

$$\frac{f^{-\frac{b^2}{4c}}\left(-2\sqrt{c}\,f^{\frac{(b+2cx)^2}{4c}} + \sqrt{\pi}\,(b+2cx)\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)\sqrt{\log(f)}\right)}{4c^{3/2}(b+2cx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(b*x + c*x^2)/(b + 2*c*x)^2,x]
```

```
[Out] (-2*Sqrt[c]*f^((b + 2*c*x)^2/(4*c)) + Sqrt[Pi]*(b + 2*c*x)*Erfi[((b + 2*c*x
)*Sqrt[Log[f]])/(2*Sqrt[c])]*Sqrt[Log[f]])/(4*c^(3/2)*f^(b^2/(4*c))*(b + 2*
c*x))
```

Maple [A]
time = 0.08, size = 87, normalized size = 1.07

method	result	size
risch	$-\frac{f^{\frac{(2cx+b)^2}{4c}}f^{-\frac{b^2}{4c}}}{2c(2cx+b)} + \frac{\ln(f)\sqrt{\pi}\,f^{-\frac{b^2}{4c}}\,\mathrm{erf}\left(\frac{\sqrt{-\frac{\ln(f)}{c}}\,(2cx+b)}{2}\right)}{4c^2\sqrt{-\frac{\ln(f)}{c}}}$	87

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x)/(2*c*x+b)^2,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2/c/(2*c*x+b)*f^(1/4*(2*c*x+b)^2/c)*f^(-1/4*b^2/c)+1/4/c^2*ln(f)*Pi^(1/2
)*f^(-1/4*b^2/c)/(-ln(f)/c)^(1/2)*erf(1/2*(-ln(f)/c)^(1/2)*(2*c*x+b))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)/(2*c*x+b)^2,x, algorithm="maxima")
```

```
[Out] integrate(f^(c*x^2 + b*x)/(2*c*x + b)^2, x)
```

Fricas [A]
time = 0.38, size = 79, normalized size = 0.98

$$-\frac{2\,cf^{cx^2+bx}+\frac{\sqrt{\pi}\,(2\,cx+b)\sqrt{-c\log\left(f\right)}\,\operatorname{erf}\left(\frac{(2\,cx+b)\sqrt{-c\log\left(f\right)}}{2\,c}\right)}{f^{\frac{b^2}{4\,c}}}}{4\,(2\,c^3x+bc^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)/(2*c*x+b)^2,x, algorithm="fricas")
```

```
[Out] -1/4*(2*c*f^(c*x^2 + b*x) + sqrt(pi)*(2*c*x + b)*sqrt(-c*log(f))*erf(1/2*(2
*c*x + b)*sqrt(-c*log(f))/c)/f^(1/4*b^2/c))/(2*c^3*x + b*c^2)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{f^{bx+cx^2}}{(b+2cx)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x)/(2*c*x+b)**2,x)
```

```
[Out] Integral(f**(b*x + c*x**2)/(b + 2*c*x)**2, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)/(2*c*x+b)^2,x, algorithm="giac")
```

```
[Out] integrate(f^(c*x^2 + b*x)/(2*c*x + b)^2, x)
```

Mupad [B]
time = 3.78, size = 73, normalized size = 0.90

$$\frac{\sqrt{\pi}\,\operatorname{erfi}\left(\frac{\frac{b\,\ln(f)}{2}+c\,x\,\ln(f)}{\sqrt{c\,\ln\left(f\right)}}\right)\,\ln\left(f\right)}{4\,c\,f^{\frac{b^2}{4\,c}}\,\sqrt{c\,\ln\left(f\right)}}-\frac{f^{c\,x^2}\,f^{b\,x}}{2\,c\,\left(b+2\,c\,x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x + c*x^2)/(b + 2*c*x)^2,x)
```

```
[Out] (pi^(1/2)*erfi(((b*log(f))/2 + c*x*log(f))/(c*log(f))^(1/2))*log(f))/(4*c*f
^(b^2/(4*c))*(c*log(f))^(1/2)) - (f^(c*x^2)*f^(b*x))/(2*c*(b + 2*c*x))
```

3.461 $\int \frac{f^{bx+cx^2}}{(b+2cx)^3}\,dx$

Optimal. Leaf size=66

$$-\frac{f^{bx+cx^2}}{4c(b+2cx)^2}+\frac{f^{-\frac{b^2}{4c}}\text{Ei}\left(\frac{(b+2cx)^2\log(f)}{4c}\right)\log(f)}{16c^2}$$

```
[Out] -1/4*f^(c*x^2+b*x)/c/(2*c*x+b)^2+1/16*Ei(1/4*(2*c*x+b)^2*ln(f)/c)*ln(f)/c^2
/(f^(1/4*b^2/c))
```

Rubi [A]
time = 0.04, antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}=0.100$, Rules used = {2271, 2270}

$$\frac{\log(f)f^{-\frac{b^2}{4c}}\text{Ei}\left(\frac{(b+2cx)^2\log(f)}{4c}\right)}{16c^2}-\frac{f^{bx+cx^2}}{4c(b+2cx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[f^(b*x + c*x^2)/(b + 2*c*x)^3,x]
```

```
[Out] -1/4*f^(b*x + c*x^2)/(c*(b + 2*c*x)^2) + (ExpIntegralEi[((b + 2*c*x)^2*Log[
f])/(4*c)]*Log[f])/(16*c^2*f^(b^2/(4*c)))
```

Rule 2270

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)/((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(1/(2*e))*F^(a - b^2/(4*c))*ExpIntegralEi[(b + 2*c*x)^2*(Log[F]/(
4*c))], x] /; FreeQ[{F, a, b, c, d, e}, x] && EqQ[b*e - 2*c*d, 0]
```

Rule 2271

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*(F^(a + b*x + c*x^2)/(e*(m + 1))), x] - Di
st[2*c*(Log[F]/(e^2*(m + 1))), Int[(d + e*x)^(m + 2)*F^(a + b*x + c*x^2), x
], x] /; FreeQ[{F, a, b, c, d, e}, x] && EqQ[b*e - 2*c*d, 0] && LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{f^{bx+cx^2}}{(b+2cx)^3}\,dx &= -\frac{f^{bx+cx^2}}{4c(b+2cx)^2}+\frac{\log(f)\int \frac{f^{bx+cx^2}}{b+2cx}\,dx}{4c}\\ &= -\frac{f^{bx+cx^2}}{4c(b+2cx)^2}+\frac{f^{-\frac{b^2}{4c}}\text{Ei}\left(\frac{(b+2cx)^2\log(f)}{4c}\right)\log(f)}{16c^2}\end{aligned}$$

Mathematica [A]
time = 0.21, size = 77, normalized size = 1.17

$$\frac{f^{-\frac{b^2}{4c}}\left(-4cf^{\frac{(b+2cx)^2}{4c}}+(b+2cx)^2\text{Ei}\left(\frac{(b+2cx)^2\log(f)}{4c}\right)\log(f)\right)}{16c^2(b+2cx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(b*x + c*x^2)/(b + 2*c*x)^3,x]
```

```
[Out] (-4*c*f^((b + 2*c*x)^2/(4*c)) + (b + 2*c*x)^2*ExpIntegralEi[((b + 2*c*x)^2*
Log[f])/(4*c)]*Log[f])/(16*c^2*f^(b^2/(4*c))*(b + 2*c*x)^2)
```

Maple [A]
time = 0.08, size = 74, normalized size = 1.12

method	result	size
risch	$-\frac{f^{\frac{(2cx+b)^2}{4c}}f^{-\frac{b^2}{4c}}}{4c(2cx+b)^2}-\frac{\ln(f)f^{-\frac{b^2}{4c}}\,\text{expIntegral}\left(1,-\frac{(2cx+b)^2\ln(f)}{4c}\right)}{16c^2}$	74

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x)/(2*c*x+b)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/4/c/(2*c*x+b)^2*f^(1/4*(2*c*x+b)^2/c)*f^(-1/4*b^2/c)-1/16/c^2*ln(f)*f^(-
1/4*b^2/c)*Ei(1,-1/4*(2*c*x+b)^2*ln(f)/c)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)/(2*c*x+b)^3,x, algorithm="maxima")
```

```
[Out] integrate(f^(c*x^2 + b*x)/(2*c*x + b)^3, x)
```

Fricas [A]
time = 0.36, size = 100, normalized size = 1.52

$$-\frac{4\,cf^{cx^2+bx}-\frac{(4\,c^2x^2+4\,bcx+b^2)\text{Ei}\left(\frac{\left(4\,c^2x^2+4\,bcx+b^2\right)\log(f)}{4\,c}\right)\log(f)}{f^{\frac{b^2}{4\,c}}}}{16\,(4\,c^4x^2+4\,bc^3x+b^2c^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)/(2*c*x+b)^3,x, algorithm="fricas")
```

```
[Out] -1/16*(4*c*f^(c*x^2 + b*x) - (4*c^2*x^2 + 4*b*c*x + b^2)*Ei(1/4*(4*c^2*x^2
+ 4*b*c*x + b^2)*log(f)/c)*log(f)/f^(1/4*b^2/c))/(4*c^4*x^2 + 4*b*c^3*x + b
^2*c^2)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx+cx^2}}{(b+2cx)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x)/(2*c*x+b)**3,x)
```

```
[Out] Integral(f**(b*x + c*x**2)/(b + 2*c*x)**3, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)/(2*c*x+b)^3,x, algorithm="giac")
```

```
[Out] integrate(f^(c*x^2 + b*x)/(2*c*x + b)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{f^{c\,x^2+b\,x}}{{(b+2\,c\,x)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x + c*x^2)/(b + 2*c*x)^3,x)
```

```
[Out] int(f^(b*x + c*x^2)/(b + 2*c*x)^3, x)
```

3.462 $\int \frac{e^{a+bx}}{x^2(c+dx^2)}\,dx$

Optimal. Leaf size=145

$$-\frac{e^{a+bx}}{cx}+\frac{be^a\text{Ei}(bx)}{c}+\frac{\sqrt{d}\,e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\text{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2(-c)^{3/2}}-\frac{\sqrt{d}\,e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\text{Ei}\left(\frac{b\left(\sqrt{-c}+\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2(-c)^{3/2}}$$

```
[Out] -exp(b*x+a)/c/x+b*exp(a)*Ei(b*x)/c+1/2*exp(a+b*(-c)^(1/2)/d^(1/2))*Ei(-b*((
-c)^(1/2)-x*d^(1/2))/d^(1/2))*d^(1/2)/(-c)^(3/2)-1/2*exp(a-b*(-c)^(1/2)/d^(
1/2))*Ei(b*((-c)^(1/2)+x*d^(1/2))/d^(1/2))*d^(1/2)/(-c)^(3/2)
```

Rubi [A]

time = 0.24, antiderivative size = 145, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2303, 2208, 2209, 2301}

$$\frac{\sqrt{d}\,e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\text{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2(-c)^{3/2}}-\frac{\sqrt{d}\,e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\text{Ei}\left(\frac{b\left(\sqrt{d}\,x+\sqrt{-c}\right)}{\sqrt{d}}\right)}{2(-c)^{3/2}}+\frac{e^a b\text{Ei}(bx)}{c}-\frac{e^{a+bx}}{cx}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x)/(x^2*(c + d*x^2)),x]
```

```
[Out] -(E^(a + b*x)/(c*x)) + (b*E^a*ExpIntegralEi[b*x])/c + (Sqrt[d]*E^(a + (b*Sq
rt[-c])/Sqrt[d])*ExpIntegralEi[-((b*(Sqrt[-c] - Sqrt[d]*x))/Sqrt[d])])/(2*(
-c)^(3/2)) - (Sqrt[d]*E^(a - (b*Sqrt[-c])/Sqrt[d])*ExpIntegralEi[(b*(Sqrt[-
c] + Sqrt[d]*x))/Sqrt[d]])/(2*(-c)^(3/2))
```

Rule 2208

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_), x_Symbol] :> Simp[(c + d*x)^(m + 1)*((b*F^(g*(e + f*x)))^n/(d*(m + 1)))
, x] - Dist[f*g*n*(Log[F]/(d*(m + 1))), Int[(c + d*x)^(m + 1)*(b*F^(g*(e +
f*x)))^n, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && LtQ[m, -1] && Int
egerQ[2*m] &&  !TrueQ[$UseGamma]
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2301

```
Int[(F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))/((a_) + (c_.)*(x_)^2), x_Symbol
] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), 1/(a + c*x^2), x], x] /; FreeQ[
{F, a, c, d, e, g, n}, x]
```

Rule 2303

```
Int[((F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))*(u_)^(m_.))/((a_) + (c_)*(x_)^
2), x_Symbol] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), u^m/(a + c*x^2), x]
, x] /; FreeQ[{F, a, c, d, e, g, n}, x] && PolynomialQ[u, x] && IntegerQ[m]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{a+bx}}{x^2(c+dx^2)}\,dx &= \int \left(\frac{e^{a+bx}}{cx^2}-\frac{de^{a+bx}}{c(c+dx^2)}\right)dx\\
&= \frac{\int \frac{e^{a+bx}}{x^2}\,dx}{c}-\frac{d\int \frac{e^{a+bx}}{c+dx^2}\,dx}{c}\\
&= -\frac{e^{a+bx}}{cx}+\frac{b\int \frac{e^{a+bx}}{x}\,dx}{c}-\frac{d\int \left(\frac{\sqrt{-c}\,e^{a+bx}}{2c\left(\sqrt{-c}-\sqrt{d}\,x\right)}+\frac{\sqrt{-c}\,e^{a+bx}}{2c\left(\sqrt{-c}+\sqrt{d}\,x\right)}\right)dx}{c}\\
&= -\frac{e^{a+bx}}{cx}+\frac{be^a\text{Ei}(bx)}{c}-\frac{d\int \frac{e^{a+bx}}{\sqrt{-c}-\sqrt{d}\,x}\,dx}{2(-c)^{3/2}}-\frac{d\int \frac{e^{a+bx}}{\sqrt{-c}+\sqrt{d}\,x}\,dx}{2(-c)^{3/2}}\\
&= -\frac{e^{a+bx}}{cx}+\frac{be^a\text{Ei}(bx)}{c}+\frac{\sqrt{d}\,e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\text{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2(-c)^{3/2}}-\frac{\sqrt{d}\,e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\text{Ei}\left(\frac{b\left(\sqrt{-\right.}{2(-c)^{3/2}}\end{aligned}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.22, size = 133, normalized size = 0.92

$$\frac{e^a\left(-2\sqrt{c}\,e^{bx}+2b\sqrt{c}\,x\text{Ei}(bx)+i\sqrt{d}\,e^{\frac{ib\sqrt{c}}{\sqrt{d}}}x\text{Ei}\left(b\left(-\frac{i\sqrt{c}}{\sqrt{d}}+x\right)\right)-i\sqrt{d}\,e^{-\frac{ib\sqrt{c}}{\sqrt{d}}}x\text{Ei}\left(b\left(\frac{i\sqrt{c}}{\sqrt{d}}+x\right)\right)\right)}{2c^{3/2}x}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x)/(x^2*(c + d*x^2)),x]
[Out] (E^a*(-2*Sqrt[c]*E^(b*x) + 2*b*Sqrt[c]*x*ExpIntegralEi[b*x] + I*Sqrt[d]*E^(
(I*b*Sqrt[c])/Sqrt[d])*x*ExpIntegralEi[b*(((-I)*Sqrt[c])/Sqrt[d] + x)] - (I
*Sqrt[d]*x*ExpIntegralEi[b*((I*Sqrt[c])/Sqrt[d] + x)])/E^((I*b*Sqrt[c])/Sqr
t[d])))/(2*c^(3/2)*x)
```

Maple [A]
time = 0.08, size = 142, normalized size = 0.98

method	result
derivativedivides	$b\left(-\frac{e^{bx+a}}{cbx}+\frac{d\left(e^{\frac{b\sqrt{-cd}+ad}{d}}\operatorname{expIntegral}\left(1,\frac{b\sqrt{-cd}+ad-(bx+a)d}{d}\right)-e^{-\frac{b\sqrt{-cd}-ad}{d}}\operatorname{expIntegral}\left(1,-\frac{b\sqrt{-cd}\ldots}{}\right.\right.}{2cb\sqrt{-cd}}\right.$
default	$b\left(-\frac{e^{bx+a}}{cbx}+\frac{d\left(e^{\frac{b\sqrt{-cd}+ad}{d}}\operatorname{expIntegral}\left(1,\frac{b\sqrt{-cd}+ad-(bx+a)d}{d}\right)-e^{-\frac{b\sqrt{-cd}-ad}{d}}\operatorname{expIntegral}\left(1,-\frac{b\sqrt{-cd}\ldots}{}\right.\right.}{2cb\sqrt{-cd}}\right.$
risch	$-\frac{e^{bx+a}}{cx}-\frac{d\,e^{\frac{-b\sqrt{-cd}+ad}{d}}\operatorname{expIntegral}\left(1,-\frac{b\sqrt{-cd}-ad+(bx+a)d}{d}\right)}{2c\sqrt{-cd}}+\frac{d\,e^{\frac{b\sqrt{-cd}+ad}{d}}\operatorname{expIntegral}\left(1,\frac{b\sqrt{-cd}\ldots}{}\right.}{2c\sqrt{-cd}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(b*x+a)/x^2/(d*x^2+c),x,method=_RETURNVERBOSE)
```

```
[Out] b*(-exp(b*x+a)/c/b/x+1/2*d*(exp((b*(-c*d)^(1/2)+a*d)/d)*Ei(1,(b*(-c*d)^(1/2
)+a*d-(b*x+a)*d)/d)-exp(-(b*(-c*d)^(1/2)-a*d)/d)*Ei(1,-(b*(-c*d)^(1/2)-a*d+
(b*x+a)*d)/d))/c/b/(-c*d)^(1/2)-1/c*exp(a)*Ei(1,-b*x))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)/x^2/(d*x^2+c),x, algorithm="maxima")
```

```
[Out] integrate(e^(b*x + a)/((d*x^2 + c)*x^2), x)
```

Fricas [A]
time = 0.40, size = 128, normalized size = 0.88

$$\frac{2\,b^2cx\mathrm{Ei}(bx)\,e^a+\sqrt{-\frac{b^2c}{d}}\,dx\mathrm{Ei}\left(bx-\sqrt{-\frac{b^2c}{d}}\right)e^{\left(a+\sqrt{-\frac{b^2c}{d}}\right)}-\sqrt{-\frac{b^2c}{d}}\,dx\mathrm{Ei}\left(bx+\sqrt{-\frac{b^2c}{d}}\right)e^{\left(a-\sqrt{-\frac{b^2c}{d}}\right)}-2\,bce^{(bx+a)}}{2\,bc^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)/x^2/(d*x^2+c),x, algorithm="fricas")
```

```
[Out] 1/2*(2*b^2*c*x*Ei(b*x)*e^a + sqrt(-b^2*c/d)*d*x*Ei(b*x - sqrt(-b^2*c/d))*e^
(a + sqrt(-b^2*c/d)) - sqrt(-b^2*c/d)*d*x*Ei(b*x + sqrt(-b^2*c/d))*e^(a - s
qrt(-b^2*c/d)) - 2*b*c*e^(b*x + a))/(b*c^2*x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$e^{a}\int \frac{e^{bx}}{cx^{2}+dx^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)/x**2/(d*x**2+c),x)
```

```
[Out] exp(a)*Integral(exp(b*x)/(c*x**2 + d*x**4), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)/x^2/(d*x^2+c),x, algorithm="giac")
```

```
[Out] integrate(e^(b*x + a)/((d*x^2 + c)*x^2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{e}^{a+b\,x}}{x^{2}\,\left(d\,x^{2}+c\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x)/(x^2*(c + d*x^2)),x)
```

```
[Out] int(exp(a + b*x)/(x^2*(c + d*x^2)), x)
```

3.463 $\int \frac{e^{a+bx}}{x(c+dx^2)}\,dx$

Optimal. Leaf size=111

$$\frac{e^a\text{Ei}(bx)}{c}-\frac{e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\text{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2c}-\frac{e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\text{Ei}\left(\frac{b\left(\sqrt{-c}+\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2c}$$

```
[Out] exp(a)*Ei(b*x)/c-1/2*exp(a+b*(-c)^(1/2)/d^(1/2))*Ei(-b*((-c)^(1/2)-x*d^(1/2
))/d^(1/2))/c-1/2*exp(a-b*(-c)^(1/2)/d^(1/2))*Ei(b*((-c)^(1/2)+x*d^(1/2))/d
^(1/2))/c
```

Rubi [A]
time = 0.18, antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {2303, 2209}

$$-\frac{e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\text{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2c}-\frac{e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\text{Ei}\left(\frac{b\left(\sqrt{d}\,x+\sqrt{-c}\right)}{\sqrt{d}}\right)}{2c}+\frac{e^a\text{Ei}(bx)}{c}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x)/(x*(c + d*x^2)),x]
```

```
[Out] (E^a*ExpIntegralEi[b*x])/c - (E^(a + (b*Sqrt[-c])/Sqrt[d])*ExpIntegralEi[-(
(b*(Sqrt[-c] - Sqrt[d]*x))/Sqrt[d])])/(2*c) - (E^(a - (b*Sqrt[-c])/Sqrt[d])
*ExpIntegralEi[(b*(Sqrt[-c] + Sqrt[d]*x))/Sqrt[d]])/(2*c)
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2303

```
Int[((F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))*(u_)^(m_.))/((a_) + (c_)*(x_)^
2), x_Symbol] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), u^m/(a + c*x^2), x]
, x] /; FreeQ[{F, a, c, d, e, g, n}, x] && PolynomialQ[u, x] && IntegerQ[m]
```

Rubi steps

$$\begin{aligned}
\int \frac{e^{a+bx}}{x\left(c+dx^2\right)}\,dx &= \int \left(\frac{e^{a+bx}}{cx}-\frac{de^{a+bx}x}{c\left(c+dx^2\right)}\right)dx \\
&= \frac{\int \frac{e^{a+bx}}{x}\,dx}{c}-\frac{d\int \frac{e^{a+bx}x}{c+dx^2}\,dx}{c} \\
&= \frac{e^a\operatorname{Ei}(bx)}{c}-\frac{d\int \left(-\frac{e^{a+bx}}{2\sqrt{d}\left(\sqrt{-c}-\sqrt{d}\,x\right)}+\frac{e^{a+bx}}{2\sqrt{d}\left(\sqrt{-c}+\sqrt{d}\,x\right)}\right)dx}{c} \\
&= \frac{e^a\operatorname{Ei}(bx)}{c}+\frac{\sqrt{d}\int \frac{e^{a+bx}}{\sqrt{-c}-\sqrt{d}\,x}\,dx}{2c}-\frac{\sqrt{d}\int \frac{e^{a+bx}}{\sqrt{-c}+\sqrt{d}\,x}\,dx}{2c} \\
&= \frac{e^a\operatorname{Ei}(bx)}{c}-\frac{e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\operatorname{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2c}-\frac{e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\operatorname{Ei}\left(\frac{b\left(\sqrt{-c}+\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2c}
\end{aligned}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.18, size = 93, normalized size = 0.84

$$\frac{e^a\left(2\operatorname{Ei}(bx)-e^{-\frac{ib\sqrt{c}}{\sqrt{d}}}\left(e^{\frac{2ib\sqrt{c}}{\sqrt{d}}}\operatorname{Ei}\left(b\left(-\frac{i\sqrt{c}}{\sqrt{d}}+x\right)\right)+\operatorname{Ei}\left(b\left(\frac{i\sqrt{c}}{\sqrt{d}}+x\right)\right)\right)\right)}{2c}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x)/(x*(c + d*x^2)),x]
```

```
[Out] (E^a*(2*ExpIntegralEi[b*x] - (E^(((2*I)*b*Sqrt[c])/Sqrt[d])*ExpIntegralEi[b
*(((-I)*Sqrt[c])/Sqrt[d] + x)] + ExpIntegralEi[b*((I*Sqrt[c])/Sqrt[d] + x)]
)/E^((I*b*Sqrt[c])/Sqrt[d])))/(2*c)
```

Maple [A]
time = 0.07, size = 112, normalized size = 1.01

method	result
derivativedivides	$\frac{e^{\frac{b\sqrt{-cd}+ad}{d}}\operatorname{expIntegral}\left(1,\frac{b\sqrt{-cd}+ad-(bx+a)d}{d}\right)+e^{-\frac{b\sqrt{-cd}-ad}{d}}\operatorname{expIntegral}\left(1,-\frac{b\sqrt{-cd}-ad+(bx+a)d}{d}\right)}{2c}-$
default	$\frac{e^{\frac{b\sqrt{-cd}+ad}{d}}\operatorname{expIntegral}\left(1,\frac{b\sqrt{-cd}+ad-(bx+a)d}{d}\right)+e^{-\frac{b\sqrt{-cd}-ad}{d}}\operatorname{expIntegral}\left(1,-\frac{b\sqrt{-cd}-ad+(bx+a)d}{d}\right)}{2c}-$

risch	$\frac{e^{\frac{-b\sqrt{-cd}+ad}{d}}\operatorname{expIntegral}\left(1,-\frac{b\sqrt{-cd}-ad+(bx+a)d}{d}\right)}{2c}+\frac{e^{\frac{b\sqrt{-cd}+ad}{d}}\operatorname{expIntegral}\left(1,\frac{b\sqrt{-cd}+ad-(bx+a)d}{d}\right)}{2c}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(b*x+a)/x/(d*x^2+c),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*(exp((b*(-c*d)^(1/2)+a*d)/d)*Ei(1,(b*(-c*d)^(1/2)+a*d-(b*x+a)*d)/d)+exp
(-(b*(-c*d)^(1/2)-a*d)/d)*Ei(1,-(b*(-c*d)^(1/2)-a*d+(b*x+a)*d)/d))/c-1/c*ex
p(a)*Ei(1,-b*x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)/x/(d*x^2+c),x, algorithm="maxima")
```

```
[Out] integrate(e^(b*x + a)/((d*x^2 + c)*x), x)
```

Fricas [A]
time = 0.38, size = 80, normalized size = 0.72

$$-\frac{\operatorname{Ei}\left(bx-\sqrt{-\frac{b^2c}{d}}\right)e^{\left(a+\sqrt{-\frac{b^2c}{d}}\right)}+\operatorname{Ei}\left(bx+\sqrt{-\frac{b^2c}{d}}\right)e^{\left(a-\sqrt{-\frac{b^2c}{d}}\right)}-2\operatorname{Ei}(bx)\,e^a}{2\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)/x/(d*x^2+c),x, algorithm="fricas")
```

```
[Out] -1/2*(Ei(b*x - sqrt(-b^2*c/d))*e^(a + sqrt(-b^2*c/d)) + Ei(b*x + sqrt(-b^2*
c/d))*e^(a - sqrt(-b^2*c/d)) - 2*Ei(b*x)*e^a)/c
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$e^a\int\frac{e^{bx}}{cx+dx^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)/x/(d*x**2+c),x)
```

```
[Out] exp(a)*Integral(exp(b*x)/(c*x + d*x**3), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)/x/(d*x^2+c),x, algorithm="giac")
[Out] integrate(e^(b*x + a)/((d*x^2 + c)*x), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{e^{a+b\,x}}{x\,\left(d\,x^2+c\right)} \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x)/(x*(c + d*x^2)),x)
[Out] int(exp(a + b*x)/(x*(c + d*x^2)), x)
```

3.464 $\int \frac{e^{a+bx}}{c+dx^2} dx$

Optimal. Leaf size=118

$$\frac{e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\,\mathrm{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2\sqrt{-c}\,\sqrt{d}}-\frac{e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\,\mathrm{Ei}\left(\frac{b\left(\sqrt{-c}+\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2\sqrt{-c}\,\sqrt{d}}$$

```
[Out] 1/2*exp(a+b*(-c)^(1/2)/d^(1/2))*Ei(-b*((-c)^(1/2)-x*d^(1/2))/d^(1/2))/(-c)^
(1/2)/d^(1/2)-1/2*exp(a-b*(-c)^(1/2)/d^(1/2))*Ei(b*((-c)^(1/2)+x*d^(1/2))/d
^(1/2))/(-c)^(1/2)/d^(1/2)
```

Rubi [A]
time = 0.09, antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$, Rules used = {2301, 2209}

$$\frac{e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\,\mathrm{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2\sqrt{-c}\,\sqrt{d}}-\frac{e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\,\mathrm{Ei}\left(\frac{b\left(\sqrt{d}\,x+\sqrt{-c}\right)}{\sqrt{d}}\right)}{2\sqrt{-c}\,\sqrt{d}}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x)/(c + d*x^2),x]
```

```
[Out] (E^(a + (b*Sqrt[-c])/Sqrt[d])*ExpIntegralEi[-((b*(Sqrt[-c] - Sqrt[d]*x))/Sq
rt[d])])/(2*Sqrt[-c]*Sqrt[d]) - (E^(a - (b*Sqrt[-c])/Sqrt[d])*ExpIntegralEi
[(b*(Sqrt[-c] + Sqrt[d]*x))/Sqrt[d]])/(2*Sqrt[-c]*Sqrt[d])
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2301

```
Int[(F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))/((a_) + (c_.)*(x_)^2), x_Symbol
] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), 1/(a + c*x^2), x], x] /; FreeQ[
{F, a, c, d, e, g, n}, x]
```

Rubi steps

$$\int \frac{e^{a+bx}}{c+dx^2}\,dx = \int \left(\frac{\sqrt{-c}\,e^{a+bx}}{2c\left(\sqrt{-c}-\sqrt{d}\,x\right)}+\frac{\sqrt{-c}\,e^{a+bx}}{2c\left(\sqrt{-c}+\sqrt{d}\,x\right)}\right)dx$$

$$= -\frac{\int \frac{e^{a+bx}}{\sqrt{-c}-\sqrt{d}\,x}\,dx}{2\sqrt{-c}} - \frac{\int \frac{e^{a+bx}}{\sqrt{-c}+\sqrt{d}\,x}\,dx}{2\sqrt{-c}}$$

$$= \frac{e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\operatorname{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2\sqrt{-c}\,\sqrt{d}} - \frac{e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\operatorname{Ei}\left(\frac{b\left(\sqrt{-c}+\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2\sqrt{-c}\,\sqrt{d}}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.07, size = 94, normalized size = 0.80

$$-\frac{ie^{a-\frac{ib\sqrt{c}}{\sqrt{d}}}\left(e^{\frac{2ib\sqrt{c}}{\sqrt{d}}}\operatorname{Ei}\left(b\left(-\frac{i\sqrt{c}}{\sqrt{d}}+x\right)\right)-\operatorname{Ei}\left(b\left(\frac{i\sqrt{c}}{\sqrt{d}}+x\right)\right)\right)}{2\sqrt{c}\,\sqrt{d}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x)/(c + d*x^2),x]
```

```
[Out] ((-1/2*I)*E^(a - (I*b*Sqrt[c])/Sqrt[d])*(E^(((2*I)*b*Sqrt[c])/Sqrt[d])*ExpI
ntegralEi[b*(((-I)*Sqrt[c])/Sqrt[d] + x)] - ExpIntegralEi[b*((I*Sqrt[c])/Sq
rt[d] + x)]))/(Sqrt[c]*Sqrt[d])
```

Maple [A]
time = 0.06, size = 102, normalized size = 0.86

method	result
derivativedivides	$-\frac{\mathrm{e}^{\frac{b\sqrt{-cd}+ad}{d}}\operatorname{expIntegral}\left(1,\frac{b\sqrt{-cd}+ad-(bx+a)d}{d}\right)-\mathrm{e}^{-\frac{b\sqrt{-cd}-ad}{d}}\operatorname{expIntegral}\left(1,-\frac{b\sqrt{-cd}-ad+(bx+a)d}{d}\right)}{2\sqrt{-cd}}$
default	$-\frac{\mathrm{e}^{\frac{b\sqrt{-cd}+ad}{d}}\operatorname{expIntegral}\left(1,\frac{b\sqrt{-cd}+ad-(bx+a)d}{d}\right)-\mathrm{e}^{-\frac{b\sqrt{-cd}-ad}{d}}\operatorname{expIntegral}\left(1,-\frac{b\sqrt{-cd}-ad+(bx+a)d}{d}\right)}{2\sqrt{-cd}}$
risch	$\frac{\mathrm{e}^{\frac{-b\sqrt{-cd}+ad}{d}}\operatorname{expIntegral}\left(1,-\frac{b\sqrt{-cd}-ad+(bx+a)d}{d}\right)}{2\sqrt{-cd}}-\frac{\mathrm{e}^{\frac{b\sqrt{-cd}+ad}{d}}\operatorname{expIntegral}\left(1,\frac{b\sqrt{-cd}+ad-(bx+a)d}{d}\right)}{2\sqrt{-cd}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(b*x+a)/(d*x^2+c),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*(exp((b*(-c*d)^(1/2)+a*d)/d)*Ei(1,(b*(-c*d)^(1/2)+a*d-(b*x+a)*d)/d)-ex
p(-(b*(-c*d)^(1/2)-a*d)/d)*Ei(1,-(b*(-c*d)^(1/2)-a*d+(b*x+a)*d)/d))/(-c*d)^
(1/2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)/(d*x^2+c),x, algorithm="maxima")
```

```
[Out] integrate(e^(b*x + a)/(d*x^2 + c), x)
```

Fricas [A]
time = 0.36, size = 98, normalized size = 0.83

$$-\frac{\sqrt{-\frac{b^2c}{d}}\,\mathrm{Ei}\left(bx-\sqrt{-\frac{b^2c}{d}}\right)e^{\left(a+\sqrt{-\frac{b^2c}{d}}\right)}-\sqrt{-\frac{b^2c}{d}}\,\mathrm{Ei}\left(bx+\sqrt{-\frac{b^2c}{d}}\right)e^{\left(a-\sqrt{-\frac{b^2c}{d}}\right)}}{2\,bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)/(d*x^2+c),x, algorithm="fricas")
```

```
[Out] -1/2*(sqrt(-b^2*c/d)*Ei(b*x - sqrt(-b^2*c/d))*e^(a + sqrt(-b^2*c/d)) - sqrt
(-b^2*c/d)*Ei(b*x + sqrt(-b^2*c/d))*e^(a - sqrt(-b^2*c/d)))/(b*c)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$e^{a}\int\frac{e^{bx}}{c+dx^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)/(d*x**2+c),x)
```

```
[Out] exp(a)*Integral(exp(b*x)/(c + d*x**2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)/(d*x^2+c),x, algorithm="giac")
```

```
[Out] integrate(e^(b*x + a)/(d*x^2 + c), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{e^{a+b\,x}}{d\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x)/(c + d*x^2),x)
[Out] int(exp(a + b*x)/(c + d*x^2), x)
```

3.465 $\int \frac{e^{a+bx}x}{c+dx^2}\,dx$

Optimal. Leaf size=100

$$\frac{e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\operatorname{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2d}+\frac{e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\operatorname{Ei}\left(\frac{b\left(\sqrt{-c}+\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2d}$$

```
[Out] 1/2*exp(a+b*(-c)^(1/2)/d^(1/2))*Ei(-b*((-c)^(1/2)-x*d^(1/2))/d^(1/2))/d+1/2
*exp(a-b*(-c)^(1/2)/d^(1/2))*Ei(b*((-c)^(1/2)+x*d^(1/2))/d^(1/2))/d
```

Rubi [A]
time = 0.09, antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2303, 2209}

$$\frac{e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\operatorname{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2d}+\frac{e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\operatorname{Ei}\left(\frac{b\left(\sqrt{d}\,x+\sqrt{-c}\right)}{\sqrt{d}}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(E^(a + b*x)*x)/(c + d*x^2),x]
```

```
[Out] (E^(a + (b*Sqrt[-c])/Sqrt[d])*ExpIntegralEi[-((b*(Sqrt[-c] - Sqrt[d]*x))/Sq
rt[d])])/(2*d) + (E^(a - (b*Sqrt[-c])/Sqrt[d])*ExpIntegralEi[(b*(Sqrt[-c] +
 Sqrt[d]*x))/Sqrt[d]])/(2*d)
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2303

```
Int[((F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))*(u_)^(m_.))/((a_) + (c_)*(x_)^
2), x_Symbol] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), u^m/(a + c*x^2), x]
, x] /; FreeQ[{F, a, c, d, e, g, n}, x] && PolynomialQ[u, x] && IntegerQ[m]
```

Rubi steps

$$\int \frac{e^{a+bx}x}{c+dx^2}\,dx = \int \left(-\frac{e^{a+bx}}{2\sqrt{d}\left(\sqrt{-c}-\sqrt{d}\,x\right)}+\frac{e^{a+bx}}{2\sqrt{d}\left(\sqrt{-c}+\sqrt{d}\,x\right)}\right)dx$$

$$= -\frac{\int \frac{e^{a+bx}}{\sqrt{-c}-\sqrt{d}\,x}\,dx}{2\sqrt{d}}+\frac{\int \frac{e^{a+bx}}{\sqrt{-c}+\sqrt{d}\,x}\,dx}{2\sqrt{d}}$$

$$= \frac{e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\operatorname{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2d}+\frac{e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\operatorname{Ei}\left(\frac{b\left(\sqrt{-c}+\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2d}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.07, size = 83, normalized size = 0.83

$$\frac{e^{a-\frac{ib\sqrt{c}}{\sqrt{d}}}\left(e^{\frac{2ib\sqrt{c}}{\sqrt{d}}}\operatorname{Ei}\left(b\left(-\frac{i\sqrt{c}}{\sqrt{d}}+x\right)\right)+\operatorname{Ei}\left(b\left(\frac{i\sqrt{c}}{\sqrt{d}}+x\right)\right)\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(a + b*x)*x)/(c + d*x^2),x]
```

```
[Out] (E^(a - (I*b*Sqrt[c])/Sqrt[d])*(E^(((2*I)*b*Sqrt[c])/Sqrt[d])*ExpIntegralEi
[b*(((-I)*Sqrt[c])/Sqrt[d] + x)] + ExpIntegralEi[b*((I*Sqrt[c])/Sqrt[d] + x
)]))/(2*d)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 322 vs. $2(74) = 148$.
time = 0.08, size = 323, normalized size = 3.23

method	result
risch	$-\frac{e^{\frac{b\sqrt{-cd}+ad}{d}}\operatorname{expIntegral}\left(1,\frac{b\sqrt{-cd}+ad-(bx+a)d}{d}\right)}{2d}-\frac{e^{\frac{-b\sqrt{-cd}+ad}{d}}\operatorname{expIntegral}\left(1,-\frac{b\sqrt{-cd}-ad+(bx+a)d}{d}\right)}{2d}$
derivativedivides	$-\frac{b\left(e^{\frac{b\sqrt{-cd}+ad}{d}}\operatorname{expIntegral}\left(1,\frac{b\sqrt{-cd}+ad-(bx+a)d}{d}\right)\sqrt{-cd}\,b+e^{\frac{b\sqrt{-cd}+ad}{d}}\operatorname{expIntegral}\left(1,\frac{b\sqrt{-cd}+ad-(bx+a)d}{d}\right.\right.}{}$
default	$-\frac{b\left(e^{\frac{b\sqrt{-cd}+ad}{d}}\operatorname{expIntegral}\left(1,\frac{b\sqrt{-cd}+ad-(bx+a)d}{d}\right)\sqrt{-cd}\,b+e^{\frac{b\sqrt{-cd}+ad}{d}}\operatorname{expIntegral}\left(1,\frac{b\sqrt{-cd}+ad-(bx+a)d}{d}\right.\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(b*x+a)*x/(d*x^2+c),x,method=_RETURNVERBOSE)
```

```
[Out] 1/b^2*(-1/2*b/d*(exp((b*(-c*d)^(1/2)+a*d)/d)*Ei(1,(b*(-c*d)^(1/2)+a*d-(b*x+
a)*d)/d)*(-c*d)^(1/2)*b+exp((b*(-c*d)^(1/2)+a*d)/d)*Ei(1,(b*(-c*d)^(1/2)+a*
d-(b*x+a)*d)/d)*a*d+exp(-(b*(-c*d)^(1/2)-a*d)/d)*Ei(1,-(b*(-c*d)^(1/2)-a*d+
(b*x+a)*d)/d)*(-c*d)^(1/2)*b-exp(-(b*(-c*d)^(1/2)-a*d)/d)*Ei(1,-(b*(-c*d)^(
1/2)-a*d+(b*x+a)*d)/d)*a*d)/(-c*d)^(1/2)+1/2*a*b*(exp((b*(-c*d)^(1/2)+a*d)/
d)*Ei(1,(b*(-c*d)^(1/2)+a*d-(b*x+a)*d)/d)-exp(-(b*(-c*d)^(1/2)-a*d)/d)*Ei(1
,-(b*(-c*d)^(1/2)-a*d+(b*x+a)*d)/d))/(-c*d)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)*x/(d*x^2+c),x, algorithm="maxima")
```

```
[Out] x*e^(b*x + a)/(b*d*x^2 + b*c) + integrate((d*x^2*e^a - c*e^a)*e^(b*x)/(b*d^
2*x^4 + 2*b*c*d*x^2 + b*c^2), x)
```

Fricas [A]
time = 0.43, size = 72, normalized size = 0.72

$$\frac{\mathrm{Ei}\left(bx-\sqrt{-\frac{b^2c}{d}}\right)e^{\left(a+\sqrt{-\frac{b^2c}{d}}\right)}+\mathrm{Ei}\left(bx+\sqrt{-\frac{b^2c}{d}}\right)e^{\left(a-\sqrt{-\frac{b^2c}{d}}\right)}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)*x/(d*x^2+c),x, algorithm="fricas")
```

```
[Out] 1/2*(Ei(b*x - sqrt(-b^2*c/d))*e^(a + sqrt(-b^2*c/d)) + Ei(b*x + sqrt(-b^2*c
/d))*e^(a - sqrt(-b^2*c/d)))/d
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$e^{a}\int\frac{xe^{bx}}{c+dx^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)*x/(d*x**2+c),x)
```

```
[Out] exp(a)*Integral(x*exp(b*x)/(c + d*x**2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)*x/(d*x^2+c),x, algorithm="giac")
```

```
[Out] integrate(x*e^(b*x + a)/(d*x^2 + c), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\mathrm{e}^{a+b\,x}}{d\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*exp(a + b*x))/(c + d*x^2),x)
```

```
[Out] int((x*exp(a + b*x))/(c + d*x^2), x)
```

3.466 $\int \frac{e^{a+bx}x^2}{c+dx^2}\,dx$

Optimal. Leaf size=132

$$\frac{e^{a+bx}}{bd}+\frac{\sqrt{-c}\,e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\operatorname{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2d^{3/2}}-\frac{\sqrt{-c}\,e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\operatorname{Ei}\left(\frac{b\left(\sqrt{-c}+\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2d^{3/2}}$$

```
[Out] exp(b*x+a)/b/d+1/2*exp(a+b*(-c)^(1/2)/d^(1/2))*Ei(-b*((-c)^(1/2)-x*d^(1/2))
/d^(1/2))*(-c)^(1/2)/d^(3/2)-1/2*exp(a-b*(-c)^(1/2)/d^(1/2))*Ei(b*((-c)^(1/
2)+x*d^(1/2))/d^(1/2))*(-c)^(1/2)/d^(3/2)
```

Rubi [A]
time = 0.17, antiderivative size = 132, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2303, 2225, 2301, 2209}

$$\frac{\sqrt{-c}\,e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\operatorname{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2d^{3/2}}-\frac{\sqrt{-c}\,e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\operatorname{Ei}\left(\frac{b\left(\sqrt{d}\,x+\sqrt{-c}\right)}{\sqrt{d}}\right)}{2d^{3/2}}+\frac{e^{a+bx}}{bd}$$

Antiderivative was successfully verified.

```
[In] Int[(E^(a + b*x)*x^2)/(c + d*x^2),x]
```

```
[Out] E^(a + b*x)/(b*d) + (Sqrt[-c]*E^(a + (b*Sqrt[-c])/Sqrt[d])*ExpIntegralEi[-(
(b*(Sqrt[-c] - Sqrt[d]*x))/Sqrt[d])])/(2*d^(3/2)) - (Sqrt[-c]*E^(a - (b*Sqr
t[-c])/Sqrt[d])*ExpIntegralEi[(b*(Sqrt[-c] + Sqrt[d]*x))/Sqrt[d]])/(2*d^(3/
2))
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2301

```
Int[(F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))/((a_) + (c_.)*(x_)^2), x_Symbol
] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), 1/(a + c*x^2), x], x] /; FreeQ[
```

```
{F, a, c, d, e, g, n}, x]
```

Rule 2303

```
Int[((F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))*(u_)^(m_.))/((a_) + (c_)*(x_)^
2), x_Symbol] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), u^m/(a + c*x^2), x]
, x] /; FreeQ[{F, a, c, d, e, g, n}, x] && PolynomialQ[u, x] && IntegerQ[m]
```

Rubi steps

$$\begin{aligned}
\int \frac{e^{a+bx}x^2}{c+dx^2}\,dx &= \int \left(\frac{e^{a+bx}}{d}-\frac{ce^{a+bx}}{d\,(c+dx^2)}\right)dx\\
&= \frac{\int e^{a+bx}\,dx}{d}-\frac{c\int \frac{e^{a+bx}}{c+dx^2}\,dx}{d}\\
&= \frac{e^{a+bx}}{bd}-\frac{c\int \left(\frac{\sqrt{-c}\,e^{a+bx}}{2c\left(\sqrt{-c}-\sqrt{d}\,x\right)}+\frac{\sqrt{-c}\,e^{a+bx}}{2c\left(\sqrt{-c}+\sqrt{d}\,x\right)}\right)dx}{d}\\
&= \frac{e^{a+bx}}{bd}-\frac{\sqrt{-c}\int \frac{e^{a+bx}}{\sqrt{-c}-\sqrt{d}\,x}\,dx}{2d}-\frac{\sqrt{-c}\int \frac{e^{a+bx}}{\sqrt{-c}+\sqrt{d}\,x}\,dx}{2d}\\
&= \frac{e^{a+bx}}{bd}+\frac{\sqrt{-c}\,e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\,\mathrm{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2d^{3/2}}-\frac{\sqrt{-c}\,e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\,\mathrm{Ei}\left(\frac{b\left(\sqrt{-c}+\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2d^{3/2}}
\end{aligned}$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.12, size = 120, normalized size = 0.91

$$\frac{e^a\left(2\sqrt{d}\,e^{bx}+ib\sqrt{c}\,e^{\frac{ib\sqrt{c}}{\sqrt{d}}}\,\mathrm{Ei}\left(b\left(-\frac{i\sqrt{c}}{\sqrt{d}}+x\right)\right)-ib\sqrt{c}\,e^{-\frac{ib\sqrt{c}}{\sqrt{d}}}\,\mathrm{Ei}\left(b\left(\frac{i\sqrt{c}}{\sqrt{d}}+x\right)\right)\right)}{2bd^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(a + b*x)*x^2)/(c + d*x^2),x]
```

```
[Out] (E^a*(2*Sqrt[d]*E^(b*x) + I*b*Sqrt[c]*E^((I*b*Sqrt[c])/Sqrt[d])*ExpIntegral
Ei[b*(((-I)*Sqrt[c])/Sqrt[d] + x)] - (I*b*Sqrt[c]*ExpIntegralEi[b*((I*Sqrt[
c])/Sqrt[d] + x)])/E^((I*b*Sqrt[c])/Sqrt[d])))/(2*b*d^(3/2))
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 659 vs. $2(97) = 194$.
time = 0.07, size = 660, normalized size = 5.00

method	result
risch	$\frac{e^{bx+a}}{bd}-\frac{e^{\frac{-b\sqrt{-cd}+ad}{d}}\operatorname{expIntegral}\left(1,-\frac{b\sqrt{-cd}-ad+(bx+a)d}{d}\right)c}{2d\sqrt{-cd}}+\frac{e^{\frac{b\sqrt{-cd}+ad}{d}}\operatorname{expIntegral}\left(1,\frac{b\sqrt{-cd}+ad}{d}\right.}{2d\sqrt{-cd}}$
derivativedivides	$-\frac{\frac{a^2b\left(e^{\frac{b\sqrt{-cd}+ad}{d}}\operatorname{expIntegral}\left(1,\frac{b\sqrt{-cd}+ad-(bx+a)d}{d}\right)-e^{-\frac{b\sqrt{-cd}-ad}{d}}\operatorname{expIntegral}\left(1,-\frac{b\sqrt{-cd}-ad+(bx+a)d}{d}\right)\right)}{2\sqrt{-cd}}}{}$
default	$-\frac{\frac{a^2b\left(e^{\frac{b\sqrt{-cd}+ad}{d}}\operatorname{expIntegral}\left(1,\frac{b\sqrt{-cd}+ad-(bx+a)d}{d}\right)-e^{-\frac{b\sqrt{-cd}-ad}{d}}\operatorname{expIntegral}\left(1,-\frac{b\sqrt{-cd}-ad+(bx+a)d}{d}\right)\right)}{2\sqrt{-cd}}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(b*x+a)*x^2/(d*x^2+c),x,method=_RETURNVERBOSE)
```

```
[Out] 1/b^3*(-1/2*a^2*b*(exp((b*(-c*d)^(1/2)+a*d)/d)*Ei(1,(b*(-c*d)^(1/2)+a*d-(b*
x+a)*d)/d)-exp(-(b*(-c*d)^(1/2)-a*d)/d)*Ei(1,-(b*(-c*d)^(1/2)-a*d+(b*x+a)*d
)/d))/(-c*d)^(1/2)+b^2/d*exp(b*x+a)-1/2/d*b*(2*exp((b*(-c*d)^(1/2)+a*d)/d)*
Ei(1,(b*(-c*d)^(1/2)+a*d-(b*x+a)*d)/d)*(-c*d)^(1/2)*a*b+exp((b*(-c*d)^(1/2)
+a*d)/d)*Ei(1,(b*(-c*d)^(1/2)+a*d-(b*x+a)*d)/d)*a^2*d-exp((b*(-c*d)^(1/2)+a
*d)/d)*Ei(1,(b*(-c*d)^(1/2)+a*d-(b*x+a)*d)/d)*b^2*c+2*exp(-(b*(-c*d)^(1/2)-
a*d)/d)*Ei(1,-(b*(-c*d)^(1/2)-a*d+(b*x+a)*d)/d)*(-c*d)^(1/2)*a*b-exp(-(b*(-
c*d)^(1/2)-a*d)/d)*Ei(1,-(b*(-c*d)^(1/2)-a*d+(b*x+a)*d)/d)*a^2*d+exp(-(b*(-
c*d)^(1/2)-a*d)/d)*Ei(1,-(b*(-c*d)^(1/2)-a*d+(b*x+a)*d)/d)*b^2*c)/(-c*d)^(1
/2)+a*b/d*(exp((b*(-c*d)^(1/2)+a*d)/d)*Ei(1,(b*(-c*d)^(1/2)+a*d-(b*x+a)*d)/
d)*(-c*d)^(1/2)*b+exp((b*(-c*d)^(1/2)+a*d)/d)*Ei(1,(b*(-c*d)^(1/2)+a*d-(b*x
+a)*d)/d)*a*d+exp(-(b*(-c*d)^(1/2)-a*d)/d)*Ei(1,-(b*(-c*d)^(1/2)-a*d+(b*x+a
)*d)/d)*(-c*d)^(1/2)*b-exp(-(b*(-c*d)^(1/2)-a*d)/d)*Ei(1,-(b*(-c*d)^(1/2)-a
*d+(b*x+a)*d)/d)*a*d)/(-c*d)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)*x^2/(d*x^2+c),x, algorithm="maxima")
```

```
[Out] x^2*e^(b*x + a)/(b*d*x^2 + b*c) - 2*c*integrate(x*e^(b*x + a)/(b*d^2*x^4 +
2*b*c*d*x^2 + b*c^2), x)
```

Fricas [A]

time = 0.36, size = 106, normalized size = 0.80

$$\frac{\sqrt{-\frac{b^2c}{d}}\,\mathrm{Ei}\left(bx-\sqrt{-\frac{b^2c}{d}}\right)e^{\left(a+\sqrt{-\frac{b^2c}{d}}\right)}-\sqrt{-\frac{b^2c}{d}}\,\mathrm{Ei}\left(bx+\sqrt{-\frac{b^2c}{d}}\right)e^{\left(a-\sqrt{-\frac{b^2c}{d}}\right)}+2\,e^{(bx+a)}}{2\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)*x^2/(d*x^2+c),x, algorithm="fricas")
```

```
[Out] 1/2*(sqrt(-b^2*c/d)*Ei(b*x - sqrt(-b^2*c/d))*e^(a + sqrt(-b^2*c/d)) - sqrt(
-b^2*c/d)*Ei(b*x + sqrt(-b^2*c/d))*e^(a - sqrt(-b^2*c/d)) + 2*e^(b*x + a))/
(b*d)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$e^{a}\int\frac{x^{2}e^{bx}}{c+dx^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)*x**2/(d*x**2+c),x)
```

```
[Out] exp(a)*Integral(x**2*exp(b*x)/(c + d*x**2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)*x^2/(d*x^2+c),x, algorithm="giac")
```

```
[Out] integrate(x^2*e^(b*x + a)/(d*x^2 + c), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{x^2\,{\mathrm{e}}^{a+b\,x}}{d\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*exp(a + b*x))/(c + d*x^2),x)
```

```
[Out] int((x^2*exp(a + b*x))/(c + d*x^2), x)
```

3.467 $\int \frac{e^{d+ex}}{x^2(a+bx+cx^2)}\,dx$

Optimal. Leaf size=212

$$-\frac{e^{d+ex}}{ax}-\frac{be^d\text{Ei}(ex)}{a^2}+\frac{ee^d\text{Ei}(ex)}{a}+\frac{\left(b+\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)e^{d-\frac{\left(b-\sqrt{b^2-4ac}\right)e}{2c}}\text{Ei}\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{2c}\right)}{2a^2}+\frac{\left(b-\frac{b}{\sqrt{b}}\right.}{}$$

```
[Out] -exp(e*x+d)/a/x-b*exp(d)*Ei(e*x)/a^2+e*exp(d)*Ei(e*x)/a+1/2*exp(d-1/2*e*(b+
(-4*a*c+b^2)^(1/2))/c)*Ei(1/2*e*(b+2*c*x+(-4*a*c+b^2)^(1/2))/c)*(b+(2*a*c-b
^2)/(-4*a*c+b^2)^(1/2))/a^2+1/2*exp(d-1/2*e*(b-(-4*a*c+b^2)^(1/2))/c)*Ei(1/
2*e*(b+2*c*x-(-4*a*c+b^2)^(1/2))/c)*(b+(-2*a*c+b^2)/(-4*a*c+b^2)^(1/2))/a^2
```

Rubi [A]
time = 0.42, antiderivative size = 212, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.130$, Rules used = {2302, 2208, 2209}

$$\frac{\left(\frac{b^2-2ac}{\sqrt{b^2-4ac}}+b\right)e^{d-\frac{e\left(b-\sqrt{b^2-4ac}\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx-\sqrt{b^2-4ac}\right)}{2c}\right)}{2a^2}+\frac{\left(b-\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)e^{d-\frac{e\left(\sqrt{b^2-4ac}+b\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx+\sqrt{b^2-4ac}\right)}{2c}\right)}{2a^2}-\frac{be^d\text{Ei}(ex)}{a^2}+\frac{e^de\text{Ei}(ex)}{a}-\frac{e^{d+ex}}{ax}$$

Antiderivative was successfully verified.

```
[In] Int[E^(d + e*x)/(x^2*(a + b*x + c*x^2)),x]
```

```
[Out] -(E^(d + e*x)/(a*x)) - (b*E^d*ExpIntegralEi[e*x])/a^2 + (e*E^d*ExpIntegralE
i[e*x])/a + ((b + (b^2 - 2*a*c)/Sqrt[b^2 - 4*a*c])*E^(d - ((b - Sqrt[b^2 -
4*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b - Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)])
/(2*a^2) + ((b - (b^2 - 2*a*c)/Sqrt[b^2 - 4*a*c])*E^(d - ((b + Sqrt[b^2 - 4
*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)])/
(2*a^2)
```

Rule 2208

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_), x_Symbol] :> Simp[(c + d*x)^(m + 1)*((b*F^(g*(e + f*x)))^n/(d*(m + 1)))
, x] - Dist[f*g*n*(Log[F]/(d*(m + 1))), Int[(c + d*x)^(m + 1)*(b*F^(g*(e +
f*x)))^n, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && LtQ[m, -1] && Int
egerQ[2*m] &&  !TrueQ[$UseGamma]
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2302

```
Int[((F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))*(u_)^(m_.))/((a_.) + (b_.)*(x_
) + (c_)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), u^m/(
a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e, g, n}, x] && Polynomia
lQ[u, x] && IntegerQ[m]
```

Rubi steps

$$\begin{aligned}
\int \frac{e^{d+ex}}{x^2(a+bx+cx^2)}\,dx &= \int \left(\frac{e^{d+ex}}{ax^2}-\frac{be^{d+ex}}{a^2x}+\frac{e^{d+ex}(b^2-ac+bcx)}{a^2(a+bx+cx^2)}\right)dx \\
&= \frac{\int \frac{e^{d+ex}(b^2-ac+bcx)}{a+bx+cx^2}\,dx}{a^2}+\frac{\int \frac{e^{d+ex}}{x^2}\,dx}{a}-\frac{b\int \frac{e^{d+ex}}{x}\,dx}{a^2} \\
&= -\frac{e^{d+ex}}{ax}-\frac{be^d\mathrm{Ei}(ex)}{a^2}+\frac{\int \left(\frac{\left(bc+\frac{c(b^2-2ac)}{\sqrt{b^2-4ac}}\right)e^{d+ex}}{b-\sqrt{b^2-4ac}+2cx}+\frac{\left(bc-\frac{c(b^2-2ac)}{\sqrt{b^2-4ac}}\right)e^{d+ex}}{b+\sqrt{b^2-4ac}+2cx}\right)dx}{a^2}+ \\
&= -\frac{e^{d+ex}}{ax}-\frac{be^d\mathrm{Ei}(ex)}{a^2}+\frac{ee^d\mathrm{Ei}(ex)}{a}+\frac{\left(c\left(b-\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)\right)\int \frac{e^{d+ex}}{b+\sqrt{b^2-4ac}+2cx}\,d}{a^2} \\
&= -\frac{e^{d+ex}}{ax}-\frac{be^d\mathrm{Ei}(ex)}{a^2}+\frac{ee^d\mathrm{Ei}(ex)}{a}+\frac{\left(b+\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)e^{d-\frac{(b-\sqrt{b^2-4ac})e}{2c}}\mathrm{Ei}\left(\frac{e(b-\sqrt{}}{}\right.}{2a^2}
\end{aligned}$$

Mathematica [A]
time = 0.67, size = 232, normalized size = 1.09

$$\frac{e^d\left(-2(b-ae)\mathrm{Ei}(ex)+\frac{e^{-\frac{(b+\sqrt{b^2-4ac})e}{2c}}\left(-2a\sqrt{b^2-4ac}\,e^{\frac{e(b+\sqrt{b^2-4ac}+2cx)}{2c}}+\left(b^2-2ac+b\sqrt{b^2-4ac}\right)e^{\frac{\sqrt{b^2-4ac}\,e}{c}}x\mathrm{Ei}\left(\frac{e(b-\sqrt{b^2-4ac}+2cx)}{2c}\right)+\left(-b^2+2ac+b\sqrt{b^2-4ac}\right)x\mathrm{Ei}\left(\frac{e(b+\sqrt{b^2-4ac}+2cx)}{2c}\right)\right)}{\sqrt{b^2-4ac}\,x}\right)}{2a^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(d + e*x)/(x^2*(a + b*x + c*x^2)),x]
```

```
[Out] (E^d*(-2*(b - a*e)*ExpIntegralEi[e*x] + (-2*a*Sqrt[b^2 - 4*a*c]*E^((e*(b +
Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)) + (b^2 - 2*a*c + b*Sqrt[b^2 - 4*a*c])*E^
((Sqrt[b^2 - 4*a*c]*e)/c)*x*ExpIntegralEi[(e*(b - Sqrt[b^2 - 4*a*c] + 2*c*x
))/(2*c)] + (-b^2 + 2*a*c + b*Sqrt[b^2 - 4*a*c])*x*ExpIntegralEi[(e*(b + Sq
rt[b^2 - 4*a*c] + 2*c*x))/(2*c)])/(Sqrt[b^2 - 4*a*c]*E^(((b + Sqrt[b^2 - 4*
a*c])*e)/(2*c))*x)))/(2*a^2)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 560 vs. $2(184) = 368$.
time = 0.14, size = 561, normalized size = 2.65

method	result
derivativedivides	$e\left(-\frac{e^{ex+d}}{aex}-\frac{-2\,e^{\frac{-be+2cd+\sqrt{-4ac\,e^2+b^2e^2}}{2c}}\,\operatorname{expIntegral}\left(1,\frac{-be+2cd-2c(ex+d)+\sqrt{-4ac\,e^2+b^2e^2}}{2c}\right)ace+e\cdots}{\cdots}\right.$
default	$e\left(-\frac{e^{ex+d}}{aex}-\frac{-2\,e^{\frac{-be+2cd+\sqrt{-4ac\,e^2+b^2e^2}}{2c}}\,\operatorname{expIntegral}\left(1,\frac{-be+2cd-2c(ex+d)+\sqrt{-4ac\,e^2+b^2e^2}}{2c}\right)ace+e\cdots}{\cdots}\right.$
risch	$-\frac{e^{ex+d}}{ax}+\frac{e\,e^{-\frac{be-2cd-\sqrt{-4ac\,e^2+b^2e^2}}{2c}}\,\operatorname{expIntegral}\left(1,\frac{-be+2cd-2c(ex+d)+\sqrt{-4ac\,e^2+b^2e^2}}{2c}\right)c}{a\sqrt{-4ac\,e^2+b^2e^2}}-\frac{e\,e^{-\frac{be-\cdots}{\cdots}}}{\cdots}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*x+d)/x^2/(c*x^2+b*x+a),x,method=_RETURNVERBOSE)
```

```
[Out] e*(-exp(e*x+d)/a/e/x-1/2*(-2*exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/
2)))*Ei(1,1/2*(-b*e+2*c*d-2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*a*c*e+
exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*d-2*c
*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b^2*e+2*exp(-1/2*(b*e-2*c*d+(-4*a*c
*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^
2)^(1/2))/c)*a*c*e-exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,
-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b^2*e+exp(1/2/c*
(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*d-2*c*(e*x+d)+(
-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2)*b+exp(-1/2*(b*e-2*
c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c
*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2)*b)/a^2/e/(-4*a*c*e^2+b^2
*e^2)^(1/2)-1/a^2/e*(a*e-b)*exp(d)*Ei(1,-e*x))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)/x^2/(c*x^2+b*x+a),x, algorithm="maxima")
```

```
[Out] integrate(e^(e*x + d)/((c*x^2 + b*x + a)*x^2), x)
```

Fricas [A]
time = 0.38, size = 314, normalized size = 1.48

$$\frac{\left(2\left((ab^2-4\,a^2c)xe^2-(b^3-4\,abc)xe\right)\operatorname{Ei}(xe)\,e^d+\left((b^2c-2\,ac^2)x\sqrt{\frac{b^2-4\,ac}{c^2}}\,e+(b^3-4\,abc)xe\right)\operatorname{Ei}\left(-\frac{c\sqrt{\frac{b^2-4\,ac}{c^2}}\,e-(2\,cx+b)e}{2\,c}\right)e^{\left(\frac{c\sqrt{\frac{b^2-4\,ac}{c^2}}\,e+2\,cd-be}{2\,c}\right)}-\left((b^2c-2\,ac^2)x\sqrt{\frac{b^2-4\,ac}{c^2}}\,e-(b^3-4\,abc)xe\right)\operatorname{Ei}\left(\frac{c\sqrt{\frac{b^2-4\,ac}{c^2}}\,e+(2\,cx+b)e}{2\,c}\right)e^{\left(-\frac{c\sqrt{\frac{b^2-4\,ac}{c^2}}\,e-2\,cd+be}{2\,c}\right)}-2\,(ab^2-4\,a^2c)e^{(xe+d+1)}\right)e^{(-1)}}{2\,(a^2b^2-4\,a^3c)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)/x^2/(c*x^2+b*x+a),x, algorithm="fricas")
```

```
[Out] 1/2*(2*((a*b^2 - 4*a^2*c)*x*e^2 - (b^3 - 4*a*b*c)*x*e)*Ei(x*e)*e^d + ((b^2*
c - 2*a*c^2)*x*sqrt((b^2 - 4*a*c)/c^2)*e + (b^3 - 4*a*b*c)*x*e)*Ei(-1/2*(c*
sqrt((b^2 - 4*a*c)/c^2)*e - (2*c*x + b)*e)/c)*e^(1/2*(c*sqrt((b^2 - 4*a*c)/
c^2)*e + 2*c*d - b*e)/c) - ((b^2*c - 2*a*c^2)*x*sqrt((b^2 - 4*a*c)/c^2)*e -
 (b^3 - 4*a*b*c)*x*e)*Ei(1/2*(c*sqrt((b^2 - 4*a*c)/c^2)*e + (2*c*x + b)*e)/
c)*e^(-1/2*(c*sqrt((b^2 - 4*a*c)/c^2)*e - 2*c*d + b*e)/c) - 2*(a*b^2 - 4*a^
2*c)*e^(x*e + d + 1))*e^(-1)/((a^2*b^2 - 4*a^3*c)*x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)/x**2/(c*x**2+b*x+a),x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)/x^2/(c*x^2+b*x+a),x, algorithm="giac")
```

```
[Out] integrate(e^(x*e + d)/((c*x^2 + b*x + a)*x^2), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{e}^{d+e\,x}}{x^2\,\left(c\,x^2+b\,x+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(d + e*x)/(x^2*(a + b*x + c*x^2)),x)
```

```
[Out] int(exp(d + e*x)/(x^2*(a + b*x + c*x^2)), x)
```

3.468 $\int \frac{e^{d+ex}}{x(a+bx+cx^2)}\,dx$

Optimal. Leaf size=169

$$\frac{e^d\text{Ei}(ex)}{a}-\frac{\left(1+\frac{b}{\sqrt{b^2-4ac}}\right)e^{d-\frac{\left(b-\sqrt{b^2-4ac}\right)e}{2c}}\text{Ei}\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{2c}\right)}{2a}-\frac{\left(1-\frac{b}{\sqrt{b^2-4ac}}\right)e^{d-\frac{(b+\sqrt{b^2-4}}{2c}}}{2}$$

[Out] exp(d)*Ei(e*x)/a-1/2*exp(d-1/2*e*(b+(-4*a*c+b^2)^(1/2))/c)*Ei(1/2*e*(b+2*c*x+(-4*a*c+b^2)^(1/2))/c)*(1-b/(-4*a*c+b^2)^(1/2))/a-1/2*exp(d-1/2*e*(b-(-4*a*c+b^2)^(1/2))/c)*Ei(1/2*e*(b+2*c*x-(-4*a*c+b^2)^(1/2))/c)*(1+b/(-4*a*c+b^2)^(1/2))/a

Rubi [A]

time = 0.29, antiderivative size = 169, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {2302, 2209}

$$-\frac{\left(\frac{b}{\sqrt{b^2-4ac}}+1\right)e^{d-\frac{e\left(b-\sqrt{b^2-4ac}\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx-\sqrt{b^2-4ac}\right)}{2c}\right)}{2a}-\frac{\left(1-\frac{b}{\sqrt{b^2-4ac}}\right)e^{d-\frac{e\left(\sqrt{b^2-4ac}+b\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx+\sqrt{b^2-4ac}\right)}{2c}\right)}{2a}+\frac{e^d\text{Ei}(ex)}{a}$$

Antiderivative was successfully verified.

[In] Int[E^(d + e*x)/(x*(a + b*x + c*x^2)),x]

[Out] (E^d*ExpIntegralEi[e*x])/a - ((1 + b/Sqrt[b^2 - 4*a*c])*E^(d - ((b - Sqrt[b^2 - 4*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b - Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)])/(2*a) - ((1 - b/Sqrt[b^2 - 4*a*c])*E^(d - ((b + Sqrt[b^2 - 4*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)])/(2*a)

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2302

```
Int[((F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))*(u_)^(m_.))/((a_.) + (b_.)*(x_
) + (c_)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), u^m/(
a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e, g, n}, x] && Polynomia
lQ[u, x] && IntegerQ[m]
```

Rubi steps

$$\int \frac{e^{d+ex}}{x(a+bx+cx^2)}dx = \int \left(\frac{e^{d+ex}}{ax} + \frac{e^{d+ex}(-b-cx)}{a(a+bx+cx^2)}\right)dx$$

$$= \frac{\int \frac{e^{d+ex}}{x}dx}{a} + \frac{\int \frac{e^{d+ex}(-b-cx)}{a+bx+cx^2}dx}{a}$$

$$= \frac{e^d\text{Ei}(ex)}{a} + \frac{\int \left(\frac{\left(-c-\frac{bc}{\sqrt{b^2-4ac}}\right)e^{d+ex}}{b-\sqrt{b^2-4ac}+2cx} + \frac{\left(-c+\frac{bc}{\sqrt{b^2-4ac}}\right)e^{d+ex}}{b+\sqrt{b^2-4ac}+2cx}\right)dx}{a}$$

$$= \frac{e^d\text{Ei}(ex)}{a} - \frac{\left(c\left(1-\frac{b}{\sqrt{b^2-4ac}}\right)\right)\int \frac{e^{d+ex}}{b+\sqrt{b^2-4ac}+2cx}dx}{a} - \frac{\left(c\left(1+\frac{b}{\sqrt{b^2-4ac}}\right.\right.}{}$$

$$= \frac{e^d\text{Ei}(ex)}{a} - \frac{\left(1+\frac{b}{\sqrt{b^2-4ac}}\right)e^{d-\frac{\left(b-\sqrt{b^2-4ac}\right)e}{2c}}\text{Ei}\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{2c}\right)}{2a} - \frac{\left(1-\right.}{}$$

Mathematica [A]
time = 0.36, size = 163, normalized size = 0.96

$$\frac{e^d\left(2\text{Ei}(ex) + \frac{e^{-\frac{\left(b+\sqrt{b^2-4ac}\right)e}{2c}}\left(-\left(\left(b+\sqrt{b^2-4ac}\right)e^{\frac{\sqrt{b^2-4ac}\,e}{c}}\text{Ei}\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{2c}\right)\right)+\left(b-\sqrt{b^2-4ac}\right)\text{Ei}\left(\frac{e\left(b+\sqrt{b^2-4ac}+2cx\right)}{2c}\right)\right)}{\sqrt{b^2-4ac}}\right)}{2a}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(d + e*x)/(x*(a + b*x + c*x^2)),x]
```

```
[Out] (E^d*(2*ExpIntegralEi[e*x] + (-((b + Sqrt[b^2 - 4*a*c])*E^((Sqrt[b^2 - 4*a*
c]*e)/c)*ExpIntegralEi[(e*(b - Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)]) + (b - S
qrt[b^2 - 4*a*c])*ExpIntegralEi[(e*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)])
/(Sqrt[b^2 - 4*a*c]*E^(((b + Sqrt[b^2 - 4*a*c])*e)/(2*c)))))/(2*a)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 368 vs. $2(142) = 284$.
time = 0.09, size = 369, normalized size = 2.18

method	result
risch	$-\frac{e^{-\frac{be-2cd+\sqrt{-4ac\,e^2+b^2e^2}}{2c}}\text{expIntegral}\left(1,-\frac{be-2cd+2c(ex+d)+\sqrt{-4ac\,e^2+b^2e^2}}{2c}\right)be}{2a\sqrt{-4ac\,e^2+b^2e^2}} + \frac{e^{-\frac{be-2cd-\sqrt{-4ac\,e^2}}{2c}}}{}$

derivativedivides	$e^{\frac{-be+2cd+\sqrt{-4ac\,e^2+b^2e^2}}{2c}}\,\mathrm{expIntegral}\left(1, \frac{-be+2cd-2c(ex+d)+\sqrt{-4ac\,e^2+b^2e^2}}{2c}\right)be - e^{-\frac{be-2cd+\sqrt{-4ac\,e^2+b^2}}{2c}}$
default	$e^{\frac{-be+2cd+\sqrt{-4ac\,e^2+b^2e^2}}{2c}}\,\mathrm{expIntegral}\left(1, \frac{-be+2cd-2c(ex+d)+\sqrt{-4ac\,e^2+b^2e^2}}{2c}\right)be - e^{-\frac{be-2cd+\sqrt{-4ac\,e^2+b^2}}{2c}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*x+d)/x/(c*x^2+b*x+a),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*(exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*
d-2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b*e-exp(-1/2*(b*e-2*c*d+(-4*a*
c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e^2+b^2*e
^2)^(1/2))/c)*b*e+exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1
/2*(-b*e+2*c*d-2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e
^2)^(1/2)+exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e
-2*c*d+2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2
))/a/(-4*a*c*e^2+b^2*e^2)^(1/2)-1/a*exp(d)*Ei(1,-e*x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)/x/(c*x^2+b*x+a),x, algorithm="maxima")
```

```
[Out] integrate(e^(e*x + d)/((c*x^2 + b*x + a)*x), x)
```

Fricas [A]
time = 0.45, size = 240, normalized size = 1.42

$$\frac{\left(2\,(b^2-4\,ac)\mathrm{Ei}(xe)\,e^{(d+1)} - \left(bc\sqrt{\frac{b^2-4\,ac}{c^2}}\,e+(b^2-4\,ac)e\right)\mathrm{Ei}\left(-\frac{c\sqrt{\frac{b^2-4\,ac}{c^2}}\,e-(2\,cx+b)e}{2\,c}\right)e^{\left(\frac{c\sqrt{\frac{b^2-4\,ac}{c^2}}\,e+2\,cd-be}{2\,c}\right)} + \left(bc\sqrt{\frac{b^2-4\,ac}{c^2}}\,e-(b^2-4\,ac)e\right)\mathrm{Ei}\left(\frac{c\sqrt{\frac{b^2-4\,ac}{c^2}}\,e+(2\,cx+b)e}{2\,c}\right)e^{\left(-\frac{c\sqrt{\frac{b^2-4\,ac}{c^2}}\,e-2\,cd+be}{2\,c}\right)}\right)e^{(-1)}}{2\,(ab^2-4\,a^2c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)/x/(c*x^2+b*x+a),x, algorithm="fricas")
```

```
[Out] 1/2*(2*(b^2 - 4*a*c)*Ei(x*e)*e^(d + 1) - (b*c*sqrt((b^2 - 4*a*c)/c^2)*e + (
b^2 - 4*a*c)*e)*Ei(-1/2*(c*sqrt((b^2 - 4*a*c)/c^2)*e - (2*c*x + b)*e)/c)*e^
(1/2*(c*sqrt((b^2 - 4*a*c)/c^2)*e + 2*c*d - b*e)/c) + (b*c*sqrt((b^2 - 4*a*
c)/c^2)*e - (b^2 - 4*a*c)*e)*Ei(1/2*(c*sqrt((b^2 - 4*a*c)/c^2)*e + (2*c*x +
 b)*e)/c)*e^(-1/2*(c*sqrt((b^2 - 4*a*c)/c^2)*e - 2*c*d + b*e)/c))*e^(-1)/(a
*b^2 - 4*a^2*c)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$e^d \int \frac{e^{ex}}{ax + bx^2 + cx^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)/x/(c*x**2+b*x+a),x)
```

```
[Out] exp(d)*Integral(exp(e*x)/(a*x + b*x**2 + c*x**3), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)/x/(c*x^2+b*x+a),x, algorithm="giac")
```

```
[Out] integrate(e^(x*e + d)/((c*x^2 + b*x + a)*x), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{e}^{d+e\,x}}{x\,\left(c\,x^2+b\,x+a\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(d + e*x)/(x*(a + b*x + c*x^2)),x)
```

```
[Out] int(exp(d + e*x)/(x*(a + b*x + c*x^2)), x)
```

3.469 $\int \frac{e^{d+ex}}{a+bx+cx^2}\,dx$

Optimal. Leaf size=138

$$\frac{e^{d-\frac{\left(b-\sqrt{b^2-4ac}\right)e}{2c}}\operatorname{Ei}\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{2c}\right)}{\sqrt{b^2-4ac}}-\frac{e^{d-\frac{\left(b+\sqrt{b^2-4ac}\right)e}{2c}}\operatorname{Ei}\left(\frac{e\left(b+\sqrt{b^2-4ac}+2cx\right)}{2c}\right)}{\sqrt{b^2-4ac}}$$

```
[Out] exp(d-1/2*e*(b-(-4*a*c+b^2)^(1/2))/c)*Ei(1/2*e*(b+2*c*x-(-4*a*c+b^2)^(1/2))
/c)/(-4*a*c+b^2)^(1/2)-exp(d-1/2*e*(b+(-4*a*c+b^2)^(1/2))/c)*Ei(1/2*e*(b+2*
c*x+(-4*a*c+b^2)^(1/2))/c)/(-4*a*c+b^2)^(1/2)
```

Rubi [A]
time = 0.14, antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2300, 2209}

$$\frac{e^{d-\frac{e\left(b-\sqrt{b^2-4ac}\right)}{2c}}\operatorname{Ei}\left(\frac{e\left(b+2cx-\sqrt{b^2-4ac}\right)}{2c}\right)}{\sqrt{b^2-4ac}}-\frac{e^{d-\frac{e\left(\sqrt{b^2-4ac}+b\right)}{2c}}\operatorname{Ei}\left(\frac{e\left(b+2cx+\sqrt{b^2-4ac}\right)}{2c}\right)}{\sqrt{b^2-4ac}}$$

Antiderivative was successfully verified.

```
[In] Int[E^(d + e*x)/(a + b*x + c*x^2),x]
```

```
[Out] (E^(d - ((b - Sqrt[b^2 - 4*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b - Sqrt[b^2 -
 4*a*c] + 2*c*x))/(2*c)])/Sqrt[b^2 - 4*a*c] - (E^(d - ((b + Sqrt[b^2 - 4*a*
c])*e)/(2*c))*ExpIntegralEi[(e*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)])/Sqr
t[b^2 - 4*a*c]
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2300

```
Int[(F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))/((a_.) + (b_.)*(x_) + (c_.)*(x_
)^2), x_Symbol] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), 1/(a + b*x + c*x^
2), x], x] /; FreeQ[{F, a, b, c, d, e, g, n}, x]
```

Rubi steps

$$\int \frac{e^{d+ex}}{a+bx+cx^2}\,dx = \int \left(\frac{2ce^{d+ex}}{\sqrt{b^2-4ac}\,\left(b-\sqrt{b^2-4ac}+2cx\right)} - \frac{2ce^{d+ex}}{\sqrt{b^2-4ac}\,\left(b+\sqrt{b^2-4ac}+2cx\right)}\right) dx$$

$$= \frac{(2c)\int \frac{e^{d+ex}}{b-\sqrt{b^2-4ac}+2cx}\,dx}{\sqrt{b^2-4ac}} - \frac{(2c)\int \frac{e^{d+ex}}{b+\sqrt{b^2-4ac}+2cx}\,dx}{\sqrt{b^2-4ac}}$$

$$= \frac{e^{d-\frac{\left(b-\sqrt{b^2-4ac}\right)e}{2c}}\text{Ei}\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{2c}\right)}{\sqrt{b^2-4ac}} - \frac{e^{d-\frac{\left(b+\sqrt{b^2-4ac}\right)e}{2c}}\text{Ei}\left(\frac{e\left(b+\sqrt{b^2-4ac}+2cx\right)}{2c}\right)}{\sqrt{b^2-4ac}}$$

Mathematica [A]
time = 0.13, size = 127, normalized size = 0.92

$$\frac{e^{d+\frac{\left(-b+\sqrt{b^2-4ac}\right)e}{2c}}\text{Ei}\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{2c}\right) - e^{d-\frac{\left(b+\sqrt{b^2-4ac}\right)e}{2c}}\text{Ei}\left(\frac{e\left(b+\sqrt{b^2-4ac}+2cx\right)}{2c}\right)}{\sqrt{b^2-4ac}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(d + e*x)/(a + b*x + c*x^2),x]
```

```
[Out] (E^(d + ((-b + Sqrt[b^2 - 4*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b - Sqrt[b^2
 - 4*a*c] + 2*c*x))/(2*c)] - E^(d - ((b + Sqrt[b^2 - 4*a*c])*e)/(2*c))*ExpIn
tegralEi[(e*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)])/Sqrt[b^2 - 4*a*c]
```

Maple [A]
time = 0.09, size = 169, normalized size = 1.22

method	result
derivativedivides	$-\frac{e\left(e^{\frac{-be+2cd+\sqrt{-4ac\,e^2+b^2e^2}}{2c}}\,\text{expIntegral}\left(1,\frac{-be+2cd-2c(ex+d)+\sqrt{-4ac\,e^2+b^2e^2}}{2c}\right)-e^{-\frac{be-2cd+\sqrt{-4ac\,e^2+}}{2c}}\right.}{\sqrt{-4ac\,e^2+b^2e^2}}$
default	$-\frac{e\left(e^{\frac{-be+2cd+\sqrt{-4ac\,e^2+b^2e^2}}{2c}}\,\text{expIntegral}\left(1,\frac{-be+2cd-2c(ex+d)+\sqrt{-4ac\,e^2+b^2e^2}}{2c}\right)-e^{-\frac{be-2cd+\sqrt{-4ac\,e^2+}}{2c}}\right.}{\sqrt{-4ac\,e^2+b^2e^2}}$
risch	$\frac{e\,e^{-\frac{be-2cd+\sqrt{-4ac\,e^2+b^2e^2}}{2c}}\,\text{expIntegral}\left(1,-\frac{be-2cd+2c(ex+d)+\sqrt{-4ac\,e^2+b^2e^2}}{2c}\right)}{\sqrt{-4ac\,e^2+b^2e^2}}-\frac{e\,e^{-\frac{be-2cd-\sqrt{-4ac\,e^2+}}{2c}}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*x+d)/(c*x^2+b*x+a),x,method=_RETURNVERBOSE)
```

```
[Out] -e*(exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*d
-2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)-exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2
+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(
1/2))/c))/(-4*a*c*e^2+b^2*e^2)^(1/2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)/(c*x^2+b*x+a),x, algorithm="maxima")
```

```
[Out] integrate(e^(e*x + d)/(c*x^2 + b*x + a), x)
```

Fricas [A]
time = 0.38, size = 187, normalized size = 1.36

$$\frac{\left(c\sqrt{\frac{b^2-4\,ac}{c^2}}\,\mathrm{Ei}\left(-\frac{c\sqrt{\frac{b^2-4\,ac}{c^2}}\,e-(2\,cx+b)e}{2\,c}\right)e^{\left(\frac{c\sqrt{\frac{b^2-4\,ac}{c^2}}\,e+2\,cd-be}{2\,c}+1\right)}-c\sqrt{\frac{b^2-4\,ac}{c^2}}\,\mathrm{Ei}\left(\frac{c\sqrt{\frac{b^2-4\,ac}{c^2}}\,e+(2\,cx+b)e}{2\,c}\right)e^{\left(-\frac{c\sqrt{\frac{b^2-4\,ac}{c^2}}\,e-2\,cd+be}{2\,c}+1\right)}\right)e^{(-1)}}{b^2-4\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)/(c*x^2+b*x+a),x, algorithm="fricas")
```

```
[Out] (c*sqrt((b^2 - 4*a*c)/c^2)*Ei(-1/2*(c*sqrt((b^2 - 4*a*c)/c^2)*e - (2*c*x +
b)*e)/c)*e^(1/2*(c*sqrt((b^2 - 4*a*c)/c^2)*e + 2*c*d - b*e)/c + 1) - c*sqrt
((b^2 - 4*a*c)/c^2)*Ei(1/2*(c*sqrt((b^2 - 4*a*c)/c^2)*e + (2*c*x + b)*e)/c)
*e^(-1/2*(c*sqrt((b^2 - 4*a*c)/c^2)*e - 2*c*d + b*e)/c + 1))*e^(-1)/(b^2 -
4*a*c)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$e^{d}\int\frac{e^{ex}}{a+bx+cx^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)/(c*x**2+b*x+a),x)
```

```
[Out] exp(d)*Integral(exp(e*x)/(a + b*x + c*x**2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)/(c*x^2+b*x+a),x, algorithm="giac")
```

```
[Out] integrate(e^(x*e + d)/(c*x^2 + b*x + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{e^{d+e\,x}}{c\,x^2+b\,x+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(d + e*x)/(a + b*x + c*x^2),x)
```

```
[Out] int(exp(d + e*x)/(a + b*x + c*x^2), x)
```

3.470 $\int \frac{e^{d+ex}x}{a+bx+cx^2}\,dx$

Optimal. Leaf size=158

$$\frac{\left(1-\frac{b}{\sqrt{b^2-4ac}}\right)e^{d-\frac{\left(b-\sqrt{b^2-4ac}\right)e}{2c}}\operatorname{Ei}\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{2c}\right)}{2c}+\frac{\left(1+\frac{b}{\sqrt{b^2-4ac}}\right)e^{d-\frac{\left(b+\sqrt{b^2-4ac}\right)e}{2c}}\operatorname{Ei}\left(\frac{e\left(b\right.}{}\right.}{2c}$$

```
[Out] 1/2*exp(d-1/2*e*(b-(-4*a*c+b^2)^(1/2))/c)*Ei(1/2*e*(b+2*c*x-(-4*a*c+b^2)^(1
/2))/c)*(1-b/(-4*a*c+b^2)^(1/2))/c+1/2*exp(d-1/2*e*(b+(-4*a*c+b^2)^(1/2))/c
)*Ei(1/2*e*(b+2*c*x+(-4*a*c+b^2)^(1/2))/c)*(1+b/(-4*a*c+b^2)^(1/2))/c
```

Rubi [A]
time = 0.15, antiderivative size = 158, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {2302, 2209}

$$\frac{\left(1-\frac{b}{\sqrt{b^2-4ac}}\right)e^{d-\frac{e\left(b-\sqrt{b^2-4ac}\right)}{2c}}\operatorname{Ei}\left(\frac{e\left(b+2cx-\sqrt{b^2-4ac}\right)}{2c}\right)}{2c}+\frac{\left(\frac{b}{\sqrt{b^2-4ac}}+1\right)e^{d-\frac{e\left(\sqrt{b^2-4ac}+b\right)}{2c}}\operatorname{Ei}\left(\frac{e\left(b+2cx+\sqrt{b^2-4ac}\right)}{2c}\right)}{2c}$$

Antiderivative was successfully verified.

```
[In] Int[(E^(d + e*x)*x)/(a + b*x + c*x^2),x]
```

```
[Out] ((1 - b/Sqrt[b^2 - 4*a*c])*E^(d - ((b - Sqrt[b^2 - 4*a*c])*e)/(2*c))*ExpInt
egralEi[(e*(b - Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)])/(2*c) + ((1 + b/Sqrt[b^
2 - 4*a*c])*E^(d - ((b + Sqrt[b^2 - 4*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b +
 Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)])/(2*c)
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2302

```
Int[((F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))*(u_)^(m_.))/((a_.) + (b_.)*(x_
) + (c_)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), u^m/(
a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e, g, n}, x] && Polynomia
lQ[u, x] && IntegerQ[m]
```

Rubi steps

$$\int \frac{e^{d+ex}x}{a+bx+cx^2}\,dx = \int \left(\frac{\left(1-\frac{b}{\sqrt{b^2-4ac}}\right)e^{d+ex}}{b-\sqrt{b^2-4ac}+2cx} + \frac{\left(1+\frac{b}{\sqrt{b^2-4ac}}\right)e^{d+ex}}{b+\sqrt{b^2-4ac}+2cx} \right) dx$$

$$= \left(1-\frac{b}{\sqrt{b^2-4ac}}\right)\int \frac{e^{d+ex}}{b-\sqrt{b^2-4ac}+2cx}\,dx + \left(1+\frac{b}{\sqrt{b^2-4ac}}\right)\int \frac{e^{d+ex}}{b+\sqrt{b^2-4a}}$$

$$= \frac{\left(1-\frac{b}{\sqrt{b^2-4ac}}\right)e^{d-\frac{\left(b-\sqrt{b^2-4ac}\right)e}{2c}}\operatorname{Ei}\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{2c}\right)}{2c} + \frac{\left(1+\frac{b}{\sqrt{b^2-4ac}}\right)e}{}$$

Mathematica [A]
time = 0.17, size = 153, normalized size = 0.97

$$\frac{e^{d-\frac{\left(b+\sqrt{b^2-4ac}\right)e}{2c}}\left(\left(-b+\sqrt{b^2-4ac}\right)e^{\frac{\sqrt{b^2-4ac}\,e}{c}}\operatorname{Ei}\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{2c}\right)+\left(b+\sqrt{b^2-4ac}\right)\operatorname{Ei}\left(\frac{e\left(b+\sqrt{b^2-4ac}+2cx\right)}{2c}\right)\right)}{2c\sqrt{b^2-4ac}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(d + e*x)*x)/(a + b*x + c*x^2),x]
```

```
[Out] (E^(d - ((b + Sqrt[b^2 - 4*a*c])*e)/(2*c))*((-b + Sqrt[b^2 - 4*a*c])*E^((Sq
rt[b^2 - 4*a*c]*e)/c)*ExpIntegralEi[(e*(b - Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*
c)] + (b + Sqrt[b^2 - 4*a*c])*ExpIntegralEi[(e*(b + Sqrt[b^2 - 4*a*c] + 2*c
*x))/(2*c)]))/(2*c*Sqrt[b^2 - 4*a*c])
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 684 vs. $2(132) = 264$.
time = 0.10, size = 685, normalized size = 4.34

method	result
risch	$-\frac{e\,e^{-\frac{be-2cd+\sqrt{-4ac\,e^2+b^2e^2}}{2c}}\operatorname{expIntegral}\left(1,-\frac{be-2cd+2c(ex+d)+\sqrt{-4ac\,e^2+b^2e^2}}{2c}\right)b}{2c\sqrt{-4ac\,e^2+b^2e^2}}+\frac{e\,e^{-\frac{be-2cd-\sqrt{-4ac}}{2c}}}{}$
derivativedivides	$-\frac{e^2\left(-e^{\frac{-be+2cd+\sqrt{-4ac\,e^2+b^2e^2}}{2c}}\operatorname{expIntegral}\left(1,\frac{-be+2cd-2c(ex+d)+\sqrt{-4ac\,e^2+b^2e^2}}{2c}\right)be+2\,e^{\frac{-be+2cd+\sqrt{-4ac\,e^2}}{2c}}\right.}{}$
default	$-\frac{e^2\left(-e^{\frac{-be+2cd+\sqrt{-4ac\,e^2+b^2e^2}}{2c}}\operatorname{expIntegral}\left(1,\frac{-be+2cd-2c(ex+d)+\sqrt{-4ac\,e^2+b^2e^2}}{2c}\right)be+2\,e^{\frac{-be+2cd+\sqrt{-4ac\,e^2}}{2c}}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*x+d)*x/(c*x^2+b*x+a),x,method=_RETURNVERBOSE)
```

```
[Out] 1/e^2*(-1/2*e^2*(-exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1
/2*(-b*e+2*c*d-2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b*e+2*exp(1/2/c*(
-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*d-2*c*(e*x+d)+(-
4*a*c*e^2+b^2*e^2)^(1/2))/c)*c*d+exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(
1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b*
e-2*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d
+2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*c*d+exp(1/2/c*(-b*e+2*c*d+(-4*a
*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*d-2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^
2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2)+exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2
*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2)
)/c)*(-4*a*c*e^2+b^2*e^2)^(1/2))/c/(-4*a*c*e^2+b^2*e^2)^(1/2)+d*e^2*(exp(1/
2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*d-2*c*(e*x+
d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)-exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^
(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c))/
(-4*a*c*e^2+b^2*e^2)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)*x/(c*x^2+b*x+a),x, algorithm="maxima")
```

```
[Out] x*e^(e*x + d)/(c*e*x^2 + b*e*x + a*e) + integrate((c*x^2*e^d - a*e^d)*e^(e*
x)/(c^2*e*x^4 + 2*b*c*e*x^3 + 2*a*b*e*x + a^2*e + (b^2*e + 2*a*c*e)*x^2), x
)
```

Fricas [A]
time = 0.36, size = 221, normalized size = 1.40

$$-\frac{\left(\left(bc\sqrt{\frac{b^2-4\,ac}{c^2}}\,e-(b^2-4\,ac)e\right)\mathrm{Ei}\left(-\frac{c\sqrt{\frac{b^2-4\,ac}{c^2}}\,e-(2\,cx+b)e}{2\,c}\right)e^{\left(\frac{c\sqrt{\frac{b^2-4\,ac}{c^2}}\,e+2\,cd-be}{2\,c}\right)}-\left(bc\sqrt{\frac{b^2-4\,ac}{c^2}}\,e+(b^2-4\,ac)e\right)\mathrm{Ei}\left(\frac{c\sqrt{\frac{b^2-4\,ac}{c^2}}\,e+(2\,cx+b)e}{2\,c}\right)e^{\left(-\frac{c\sqrt{\frac{b^2-4\,ac}{c^2}}\,e-2\,cd+be}{2\,c}\right)}\right)e^{(-1)}}{2\,(b^2c-4\,ac^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)*x/(c*x^2+b*x+a),x, algorithm="fricas")
```

```
[Out] -1/2*((b*c*sqrt((b^2 - 4*a*c)/c^2)*e - (b^2 - 4*a*c)*e)*Ei(-1/2*(c*sqrt((b^
2 - 4*a*c)/c^2)*e - (2*c*x + b)*e)/c)*e^(1/2*(c*sqrt((b^2 - 4*a*c)/c^2)*e +
 2*c*d - b*e)/c) - (b*c*sqrt((b^2 - 4*a*c)/c^2)*e + (b^2 - 4*a*c)*e)*Ei(1/2
```

```
*(c*sqrt((b^2 - 4*a*c)/c^2)*e + (2*c*x + b)*e)/c)*e^(-1/2*(c*sqrt((b^2 - 4*
a*c)/c^2)*e - 2*c*d + b*e)/c))*e^(-1)/(b^2*c - 4*a*c^2)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$e^{d}\int\frac{xe^{ex}}{a+bx+cx^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)*x/(c*x**2+b*x+a),x)
[Out] exp(d)*Integral(x*exp(e*x)/(a + b*x + c*x**2), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)*x/(c*x^2+b*x+a),x, algorithm="giac")
[Out] integrate(x*e^(x*e + d)/(c*x^2 + b*x + a), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{x\,\mathrm{e}^{d+e\,x}}{c\,x^{2}+b\,x+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*exp(d + e*x))/(a + b*x + c*x^2),x)
[Out] int((x*exp(d + e*x))/(a + b*x + c*x^2), x)
```

3.471 $\int \frac{e^{d+ex}x^2}{a+bx+cx^2}\,dx$

Optimal. Leaf size=186

$$\frac{e^{d+ex}}{ce}-\frac{\left(b-\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)e^{d-\frac{\left(b-\sqrt{b^2-4ac}\right)e}{2c}}\text{Ei}\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{2c}\right)}{2c^2}-\frac{\left(b+\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)e^{d-\frac{\left(b+\sqrt{b^2-4ac}\right)e}{2c}}}{2c^2}$$

[Out] exp(e*x+d)/c/e-1/2*exp(d-1/2*e*(b-(-4*a*c+b^2)^(1/2))/c)*Ei(1/2*e*(b+2*c*x-(-4*a*c+b^2)^(1/2))/c)*(b+(2*a*c-b^2)/(-4*a*c+b^2)^(1/2))/c^2-1/2*exp(d-1/2*e*(b+(-4*a*c+b^2)^(1/2))/c)*Ei(1/2*e*(b+2*c*x+(-4*a*c+b^2)^(1/2))/c)*(b+(-2*a*c+b^2)/(-4*a*c+b^2)^(1/2))/c^2

Rubi [A]

time = 0.29, antiderivative size = 186, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.130$, Rules used = {2302, 2225, 2209}

$$-\frac{\left(b-\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)e^{d-\frac{e\left(b-\sqrt{b^2-4ac}\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx-\sqrt{b^2-4ac}\right)}{2c}\right)}{2c^2}-\frac{\left(\frac{b^2-2ac}{\sqrt{b^2-4ac}}+b\right)e^{d-\frac{e\left(\sqrt{b^2-4ac}+b\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx+\sqrt{b^2-4ac}\right)}{2c}\right)}{2c^2}+\frac{e^{d+ex}}{ce}$$

Antiderivative was successfully verified.

[In] Int[(E^(d + e*x)*x^2)/(a + b*x + c*x^2),x]

[Out] E^(d + e*x)/(c*e) - ((b - (b^2 - 2*a*c)/Sqrt[b^2 - 4*a*c])*E^(d - ((b - Sqrt[b^2 - 4*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b - Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)])/(2*c^2) - ((b + (b^2 - 2*a*c)/Sqrt[b^2 - 4*a*c])*E^(d - ((b + Sqrt[b^2 - 4*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)])/(2*c^2)

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a + b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2302

```
Int[((F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))*(u_)^(m_.))/((a_.) + (b_.)*(x_) + (c_)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), u^m/(
```

```
a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e, g, n}, x] && Polynomia
lQ[u, x] && IntegerQ[m]
```

Rubi steps

$$
\begin{aligned}
\int \frac{e^{d+ex}x^2}{a+bx+cx^2}\,dx &= \int \left(\frac{e^{d+ex}}{c}-\frac{e^{d+ex}(a+bx)}{c\,(a+bx+cx^2)}\right)dx\\
&= \frac{\int e^{d+ex}\,dx}{c}-\frac{\int \frac{e^{d+ex}(a+bx)}{a+bx+cx^2}\,dx}{c}\\
&= \frac{e^{d+ex}}{ce}-\frac{\int \left(\frac{\left(b+\frac{-b^2+2ac}{\sqrt{b^2-4ac}}\right)e^{d+ex}}{b-\sqrt{b^2-4ac}+2cx}+\frac{\left(b-\frac{-b^2+2ac}{\sqrt{b^2-4ac}}\right)e^{d+ex}}{b+\sqrt{b^2-4ac}+2cx}\right)dx}{c}\\
&= \frac{e^{d+ex}}{ce}-\frac{\left(b-\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)\int \frac{e^{d+ex}}{b-\sqrt{b^2-4ac}+2cx}\,dx}{c}-\frac{\left(b+\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)\int \frac{e^{d+ex}}{b+\sqrt{b^2-4}}}{c}\\
&= \frac{e^{d+ex}}{ce}-\frac{\left(b-\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)e^{d-\frac{\left(b-\sqrt{b^2-4ac}\right)e}{2c}}\text{Ei}\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{2c}\right)}{2c^2}-\frac{\left(b+\frac{b^2-2}{\sqrt{b^2-}}\right.}{}
\end{aligned}
$$

Mathematica [A]
time = 0.34, size = 217, normalized size = 1.17

$$-\frac{e^{d-\frac{\left(b+\sqrt{b^2-4ac}\right)e}{2c}}\left(-2c\sqrt{b^2-4ac}\,e^{\frac{e\left(b+\sqrt{b^2-4ac}+2cx\right)}{2c}}+\left(-b^2+2ac+b\sqrt{b^2-4ac}\right)e\,e^{\frac{\sqrt{b^2-4ac}\,e}{c}}\text{Ei}\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{2c}\right)+\left(b^2-2ac+b\sqrt{b^2-4ac}\right)e\,\text{Ei}\left(\frac{e\left(b+\sqrt{b^2-4ac}+2cx\right)}{2c}\right)\right)}{2c^2\sqrt{b^2-4ac}\,e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(d + e*x)*x^2)/(a + b*x + c*x^2),x]
```

```
[Out] -1/2*(E^(d - ((b + Sqrt[b^2 - 4*a*c])*e)/(2*c))*(-2*c*Sqrt[b^2 - 4*a*c]*E^(
(e*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)) + (-b^2 + 2*a*c + b*Sqrt[b^2 - 4
*a*c])*e*E^((Sqrt[b^2 - 4*a*c]*e)/c)*ExpIntegralEi[(e*(b - Sqrt[b^2 - 4*a*c
] + 2*c*x))/(2*c)] + (b^2 - 2*a*c + b*Sqrt[b^2 - 4*a*c])*e*ExpIntegralEi[(e
*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)]))/(c^2*Sqrt[b^2 - 4*a*c]*e)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 1729 vs. 2(160) = 320.
time = 0.11, size = 1730, normalized size = 9.30

method	result

risch	$\frac{e^{ex+d}}{ce}+\frac{e\,e^{-\frac{be-2cd-\sqrt{-4ac\,e^2+b^2e^2}}{2c}}\operatorname{expIntegral}\left(1,\frac{-be+2cd-2c(ex+d)+\sqrt{-4ac\,e^2+b^2e^2}}{2c}\right)a}{c\sqrt{-4ac\,e^2+b^2e^2}}-\frac{e\,e^{-\frac{be-2c}{}}}{}$
derivativedivides	Expression too large to display
default	Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*x+d)*x^2/(c*x^2+b*x+a),x,method=_RETURNVERBOSE)
```

```
[Out] 1/e^3*(-d^2*e^2*(exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/
2*(-b*e+2*c*d-2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)-exp(-1/2*(b*e-2*c*
d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e
^2+b^2*e^2)^(1/2))/c))/(-4*a*c*e^2+b^2*e^2)^(1/2)+e^2/c*exp(e*x+d)+1/2/c^2*
e^2*(2*exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*
c*d-2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*a*c*e^2-exp(1/2/c*(-b*e+2*c*
d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*d-2*c*(e*x+d)+(-4*a*c*e^2
+b^2*e^2)^(1/2))/c)*b^2*e^2+2*exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1
/2)))*Ei(1,1/2*(-b*e+2*c*d-2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b*c*d
*e-2*exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*
d-2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*c^2*d^2-2*exp(-1/2*(b*e-2*c*d+
(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e^2
+b^2*e^2)^(1/2))/c)*a*c*e^2+exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))
/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b^2*e^2
-2*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+
2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b*c*d*e+2*exp(-1/2*(b*e-2*c*d+(-
4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e^2+b
^2*e^2)^(1/2))/c)*c^2*d^2+exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))
)*Ei(1,1/2*(-b*e+2*c*d-2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e
^2+b^2*e^2)^(1/2)*b*e-2*exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*
Ei(1,1/2*(-b*e+2*c*d-2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2
+b^2*e^2)^(1/2)*c*d+exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1
,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2
*e^2)^(1/2)*b*e-2*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-
1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e
^2)^(1/2)*c*d)/(-4*a*c*e^2+b^2*e^2)^(1/2)+d*e^2*(-exp(1/2/c*(-b*e+2*c*d+(-4
*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*d-2*c*(e*x+d)+(-4*a*c*e^2+b^2*
e^2)^(1/2))/c)*b*e+2*exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(
1,1/2*(-b*e+2*c*d-2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*c*d+exp(-1/2*(
b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(
-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b*e-2*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2
)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)
*c*d+exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*
d-2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2)+exp
```

```
(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e
*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2))/c/(-4*a*c*
e^2+b^2*e^2)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)*x^2/(c*x^2+b*x+a),x, algorithm="maxima")
```

```
[Out] x^2*e^(e*x + d)/(c*e*x^2 + b*e*x + a*e) - integrate((b*x^2*e^d + 2*a*x*e^d)
*e^(e*x)/(c^2*e*x^4 + 2*b*c*e*x^3 + 2*a*b*e*x + a^2*e + (b^2*e + 2*a*c*e)*x
^2), x)
```

Fricas [A]
time = 0.41, size = 266, normalized size = 1.43

$$\frac{\left(\left((b^2c-2\,ac^2)\sqrt{\frac{b^2-4\,ac}{c^2}}\,e-(b^3-4\,abc)e\right)\mathrm{Ei}\left(-\frac{c\sqrt{\frac{b^2-4\,ac}{c^2}}\,e-(2\,cx+b)e}{2\,c}\right)e^{\left(\frac{c\sqrt{\frac{b^2-4\,ac}{c^2}}\,e+2\,cd-be}{2\,c}\right)}-\left((b^2c-2\,ac^2)\sqrt{\frac{b^2-4\,ac}{c^2}}\,e+(b^3-4\,abc)e\right)\mathrm{Ei}\left(\frac{c\sqrt{\frac{b^2-4\,ac}{c^2}}\,e+(2\,cx+b)e}{2\,c}\right)e^{\left(-\frac{c\sqrt{\frac{b^2-4\,ac}{c^2}}\,e-2\,cd+be}{2\,c}\right)}+2\,(b^2c-4\,ac^2)e^{(xe+d)}\right)e^{(-1)}}{2\,(b^2c^2-4\,ac^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)*x^2/(c*x^2+b*x+a),x, algorithm="fricas")
```

```
[Out] 1/2*(((b^2*c - 2*a*c^2)*sqrt((b^2 - 4*a*c)/c^2)*e - (b^3 - 4*a*b*c)*e)*Ei(-
1/2*(c*sqrt((b^2 - 4*a*c)/c^2)*e - (2*c*x + b)*e)/c)*e^(1/2*(c*sqrt((b^2 -
4*a*c)/c^2)*e + 2*c*d - b*e)/c) - ((b^2*c - 2*a*c^2)*sqrt((b^2 - 4*a*c)/c^2
)*e + (b^3 - 4*a*b*c)*e)*Ei(1/2*(c*sqrt((b^2 - 4*a*c)/c^2)*e + (2*c*x + b)*
e)/c)*e^(-1/2*(c*sqrt((b^2 - 4*a*c)/c^2)*e - 2*c*d + b*e)/c) + 2*(b^2*c - 4
*a*c^2)*e^(x*e + d))*e^(-1)/(b^2*c^2 - 4*a*c^3)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$e^{d}\int\frac{x^{2}e^{ex}}{a+bx+cx^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)*x**2/(c*x**2+b*x+a),x)
```

```
[Out] exp(d)*Integral(x**2*exp(e*x)/(a + b*x + c*x**2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)*x^2/(c*x^2+b*x+a),x, algorithm="giac")
```

```
[Out] integrate(x^2*e^(x*e + d)/(c*x^2 + b*x + a), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,\mathrm{e}^{d+e\,x}}{c\,x^2+b\,x+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*exp(d + e*x))/(a + b*x + c*x^2),x)
```

```
[Out] int((x^2*exp(d + e*x))/(a + b*x + c*x^2), x)
```

3.472 $\int \frac{e^{d+ex}x^3}{a+bx+cx^2}\,dx$

Optimal. Leaf size=232

$$-\frac{e^{d+ex}}{ce^2}-\frac{be^{d+ex}}{c^2e}+\frac{e^{d+ex}x}{ce}+\frac{\left(b^2-ac-\frac{b(b^2-3ac)}{\sqrt{b^2-4ac}}\right)e^{d-\frac{\left(b-\sqrt{b^2-4ac}\right)e}{2c}}\text{Ei}\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{2c}\right)}{2c^3}+\frac{\left(b^2-ac+\right.}{}$$

```
[Out] -exp(e*x+d)/c/e^2-b*exp(e*x+d)/c^2/e+exp(e*x+d)*x/c/e+1/2*exp(d-1/2*e*(b-(-
4*a*c+b^2)^(1/2))/c)*Ei(1/2*e*(b+2*c*x-(-4*a*c+b^2)^(1/2))/c)*(b^2-a*c-b*(-
3*a*c+b^2)/(-4*a*c+b^2)^(1/2))/c^3+1/2*exp(d-1/2*e*(b+(-4*a*c+b^2)^(1/2))/c
)*Ei(1/2*e*(b+2*c*x+(-4*a*c+b^2)^(1/2))/c)*(b^2-a*c+b*(-3*a*c+b^2)/(-4*a*c+
b^2)^(1/2))/c^3
```

Rubi [A]
time = 0.36, antiderivative size = 232, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$,
Rules used = {2302, 2225, 2207, 2209}

$$\frac{\left(-\frac{b(b^2-3ac)}{\sqrt{b^2-4ac}}-ac+b^2\right)e^{d-\frac{e\left(b-\sqrt{b^2-4ac}\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx-\sqrt{b^2-4ac}\right)}{2c}\right)}{2c^3}+\frac{\left(\frac{b(b^2-3ac)}{\sqrt{b^2-4ac}}-ac+b^2\right)e^{d-\frac{e\left(\sqrt{b^2-4ac}+b\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx+\sqrt{b^2-4ac}\right)}{2c}\right)}{2c^3}-\frac{be^{d+ex}}{c^2e}-\frac{e^{d+ex}}{ce^2}+\frac{xe^{d+ex}}{ce}$$

Antiderivative was successfully verified.

```
[In] Int[(E^(d + e*x)*x^3)/(a + b*x + c*x^2),x]
```

```
[Out] -(E^(d + e*x)/(c*e^2)) - (b*E^(d + e*x))/(c^2*e) + (E^(d + e*x)*x)/(c*e) +
((b^2 - a*c - (b*(b^2 - 3*a*c))/Sqrt[b^2 - 4*a*c])*E^(d - ((b - Sqrt[b^2 -
4*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b - Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)])
/(2*c^3) + ((b^2 - a*c + (b*(b^2 - 3*a*c))/Sqrt[b^2 - 4*a*c])*E^(d - ((b +
Sqrt[b^2 - 4*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b + Sqrt[b^2 - 4*a*c] + 2*c*
x))/(2*c)])/(2*c^3)
```

Rule 2207

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[(c + d*x)^m*((b*F^(g*(e + f*x)))^n/(f*g*n*Log[F])),
x] - Dist[d*(m/(f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !TrueQ[$UseGamma]
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2302

```
Int[((F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))*(u_)^(m_.))/((a_.) + (b_.)*(x_
) + (c_)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), u^m/(
a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e, g, n}, x] && Polynomia
lQ[u, x] && IntegerQ[m]
```

Rubi steps

$$
\begin{aligned}
\int \frac{e^{d+ex}x^3}{a+bx+cx^2}\,dx &= \int \left(-\frac{be^{d+ex}}{c^2}+\frac{e^{d+ex}x}{c}+\frac{e^{d+ex}(ab+(b^2-ac)\,x)}{c^2\,(a+bx+cx^2)}\right)dx \\
&= \frac{\int \frac{e^{d+ex}(ab+(b^2-ac)x)}{a+bx+cx^2}\,dx}{c^2}-\frac{b\int e^{d+ex}\,dx}{c^2}+\frac{\int e^{d+ex}x\,dx}{c} \\
&= -\frac{be^{d+ex}}{c^2e}+\frac{e^{d+ex}x}{ce}+\frac{\int \left(\frac{\left(b^2-ac+\frac{b(-b^2+3ac)}{\sqrt{b^2-4ac}}\right)e^{d+ex}}{b-\sqrt{b^2-4ac}+2cx}+\frac{\left(b^2-ac-\frac{b(-b^2+3ac)}{\sqrt{b^2-4ac}}\right)e^{d+ex}}{b+\sqrt{b^2-4ac}+2cx}\right)dx}{c^2} \\
&= -\frac{e^{d+ex}}{ce^2}-\frac{be^{d+ex}}{c^2e}+\frac{e^{d+ex}x}{ce}+\frac{\left(b^2-ac-\frac{b(b^2-3ac)}{\sqrt{b^2-4ac}}\right)\int \frac{e^{d+ex}}{b-\sqrt{b^2-4ac}+2cx}\,dx}{c^2}+\frac{(b^2}{} \\
&= -\frac{e^{d+ex}}{ce^2}-\frac{be^{d+ex}}{c^2e}+\frac{e^{d+ex}x}{ce}+\frac{\left(b^2-ac-\frac{b(b^2-3ac)}{\sqrt{b^2-4ac}}\right)e^{d-\frac{(b-\sqrt{b^2-4ac})e}{2c}}\,\mathrm{Ei}\left(\frac{e(b-\sqrt{b^2-}}{}\right.}{2c^3}
\end{aligned}
$$

Mathematica [A]
time = 0.45, size = 268, normalized size = 1.16

$$
\frac{e^{d-\frac{be}{c}}\left(-2c\sqrt{b^2-4ac}\,e^{e\left(\frac{b}{c}+x\right)}(c+be-cex)+\left(-b^3+3abc+b^2\sqrt{b^2-4ac}-ac\sqrt{b^2-4ac}\right)e^2e^{\frac{(b+\sqrt{b^2-4ac})e}{2c}}\mathrm{Ei}\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{2c}\right)+\left(b^3-3abc+b^2\sqrt{b^2-4ac}-ac\sqrt{b^2-4ac}\right)e^2e^{\frac{(b-\sqrt{b^2-4ac})e}{2c}}\mathrm{Ei}\left(\frac{e\left(b+\sqrt{b^2-4ac}+2cx\right)}{2c}\right)\right)}{2c^3\sqrt{b^2-4ac}\,e^2}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(d + e*x)*x^3)/(a + b*x + c*x^2),x]
```

```
[Out] (E^(d - (b*e)/c)*(-2*c*Sqrt[b^2 - 4*a*c]*E^(e*(b/c + x))*(c + b*e - c*e*x)
+ (-b^3 + 3*a*b*c + b^2*Sqrt[b^2 - 4*a*c] - a*c*Sqrt[b^2 - 4*a*c])*e^2*E^((
(b + Sqrt[b^2 - 4*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b - Sqrt[b^2 - 4*a*c] +
```

```
 2*c*x))/(2*c)] + (b^3 - 3*a*b*c + b^2*Sqrt[b^2 - 4*a*c] - a*c*Sqrt[b^2 - 4
*a*c])*e^2*E^(((b - Sqrt[b^2 - 4*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b + Sqrt
[b^2 - 4*a*c] + 2*c*x))/(2*c)]))/(2*c^3*Sqrt[b^2 - 4*a*c]*e^2)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 3531 vs. $2(203) = 406$.

time = 0.14, size = 3532, normalized size = 15.22

method	result
risch	$\frac{e^{-\frac{be-2cd+\sqrt{-4ac\,e^2+b^2e^2}}{2c}}\,\mathrm{expIntegral}\left(1,-\frac{be-2cd+2c(ex+d)+\sqrt{-4ac\,e^2+b^2e^2}}{2c}\right)a}{2c^2} - \frac{e^{-\frac{be-2cd+\sqrt{-4ac\,e^2+b^2}}{2c}}}{}$
derivativedivides	Expression too large to display
default	Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*x+d)*x^3/(c*x^2+b*x+a),x,method=_RETURNVERBOSE)
```

```
[Out] 1/e^4*(-e^2*exp(e*x+d)*(b*e-2*c*d-c*(e*x+d)+c)/c^2+1/2/c^3*e^2*(-3*exp(1/2/
c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*d-2*c*(e*x+d)
+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*a*b*c*e^3+6*exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e
^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*d-2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(
1/2))/c)*a*c^2*d*e^2+exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(
1,1/2*(-b*e+2*c*d-2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b^3*e^3-3*exp(
1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*d-2*c*(e*
x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b^2*c*d*e^2+3*exp(1/2/c*(-b*e+2*c*d+(-4
*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*d-2*c*(e*x+d)+(-4*a*c*e^2+b^2*
e^2)^(1/2))/c)*b*c^2*d^2*e-2*exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/
2)))*Ei(1,1/2*(-b*e+2*c*d-2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*c^3*d^
3+3*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d
+2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*a*b*c*e^3-6*exp(-1/2*(b*e-2*c*d
+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e^
2+b^2*e^2)^(1/2))/c)*a*c^2*d*e^2-exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(
1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b^
3*e^3+3*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2
*c*d+2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b^2*c*d*e^2-3*exp(-1/2*(b*e
-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*
a*c*e^2+b^2*e^2)^(1/2))/c)*b*c^2*d^2*e+2*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^
2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2
))/c)*c^3*d^3+(-4*a*c*e^2+b^2*e^2)^(1/2)*exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+
b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*d-2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2
))/c)*a*c*e^2-(-4*a*c*e^2+b^2*e^2)^(1/2)*exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+
b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*d-2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2
))/c)*b^2*e^2+3*(-4*a*c*e^2+b^2*e^2)^(1/2)*exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^
2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*d-2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1
```

```
/2))/c)*b*c*d*e-3*(-4*a*c*e^2+b^2*e^2)^(1/2)*exp(1/2/c*(-b*e+2*c*d+(-4*a*c*
e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*d-2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^
(1/2))/c)*c^2*d^2+(-4*a*c*e^2+b^2*e^2)^(1/2)*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^
2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^
(1/2))/c)*a*c*e^2-(-4*a*c*e^2+b^2*e^2)^(1/2)*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^
2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^
(1/2))/c)*b^2*e^2+3*(-4*a*c*e^2+b^2*e^2)^(1/2)*exp(-1/2*(b*e-2*c*d+(-4*a*c*
e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2
)^(1/2))/c)*b*c*d*e-3*(-4*a*c*e^2+b^2*e^2)^(1/2)*exp(-1/2*(b*e-2*c*d+(-4*a*
c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e^2+b^2*e
^2)^(1/2))/c)*c^2*d^2)/(-4*a*c*e^2+b^2*e^2)^(1/2)+d^3*e^2*(exp(1/2/c*(-b*e+
2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*d-2*c*(e*x+d)+(-4*a*c
*e^2+b^2*e^2)^(1/2))/c)-exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*
Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c))/(-4*a*c*e^
2+b^2*e^2)^(1/2)-3*d*(e^2/c*exp(e*x+d)+1/2/c^2*e^2*(2*exp(1/2/c*(-b*e+2*c*d
+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*d-2*c*(e*x+d)+(-4*a*c*e^2+
b^2*e^2)^(1/2))/c)*a*c*e^2-exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)
))*Ei(1,1/2*(-b*e+2*c*d-2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b^2*e^2+
2*exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*d-2
*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b*c*d*e-2*exp(1/2/c*(-b*e+2*c*d+(
-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*d-2*c*(e*x+d)+(-4*a*c*e^2+b^
2*e^2)^(1/2))/c)*c^2*d^2-2*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/
c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*a*c*e^2+
exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c
*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b^2*e^2-2*exp(-1/2*(b*e-2*c*d+(-4*a
*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e^2+b^2*
e^2)^(1/2))/c)*b*c*d*e+2*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)
*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*c^2*d^2+ex
p(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*d-2*c*(
e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2)*b*e-2*exp(
1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*d-2*c*(e*
x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2)*c*d+exp(-1/2
*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)
+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2)*b*e-2*exp(-1/2*(
b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*c*(e*x+d)+(
-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2)*c*d)/(-4*a*c*e^2+b
^2*e^2)^(1/2))-3/2*d^2*e^2*(-exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/
2)))*Ei(1,1/2*(-b*e+2*c*d-2*c*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b*e+2*
exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-b*e+2*c*d-2*c
*(e*x+d)+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*c*d+exp...
```

Maxima [F]

time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)*x^3/(c*x^2+b*x+a),x, algorithm="maxima")
```

```
[Out] (c*e*x^3*e^d - c*x^2*e^d - b*x*e^d)*e^(e*x)/(c^2*e^2*x^2 + b*c*e^2*x + a*c*
e^2) - integrate(-((b*e*e^d + 2*c*e^d)*a*x + (b^2*e*e^d - 2*a*c*e*e^d)*x^2
+ a*b*e^d)*e^(e*x)/(c^3*e^2*x^4 + 2*b*c^2*e^2*x^3 + 2*a*b*c*e^2*x + a^2*c*e
^2 + (b^2*c*e^2 + 2*a*c^2*e^2)*x^2), x)
```

Fricas [A]
time = 0.40, size = 323, normalized size = 1.39

$$-\frac{\left(\left((b^3c-3abc^2)\sqrt{\frac{b^2-4ac}{c^2}}e^2-(b^4-5ab^2c+4a^2c^2)e^2\right)\operatorname{Ei}\left(-\frac{c\sqrt{\frac{b^2-4ac}{c^2}}e-(2cx+b)e}{2c}\right)e^{\left(\frac{c\sqrt{\frac{b^2-4ac}{c^2}}e+2cd-be}{2c}\right)}-\left((b^3c-3abc^2)\sqrt{\frac{b^2-4ac}{c^2}}e^2+(b^4-5ab^2c+4a^2c^2)e^2\right)\operatorname{Ei}\left(\frac{c\sqrt{\frac{b^2-4ac}{c^2}}e+(2cx+b)e}{2c}\right)e^{\left(-\frac{c\sqrt{\frac{b^2-4ac}{c^2}}e-2cd+be}{2c}\right)}+2\left(b^2c^2-4ac^3+(b^3c-4abc^2-(b^2c^2-4ac^3)x)e\right)e^{(xe+d)}\right)e^{(-2)}}{2\left(b^2c^3-4ac^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)*x^3/(c*x^2+b*x+a),x, algorithm="fricas")
```

```
[Out] -1/2*(((b^3*c - 3*a*b*c^2)*sqrt((b^2 - 4*a*c)/c^2)*e^2 - (b^4 - 5*a*b^2*c +
 4*a^2*c^2)*e^2)*Ei(-1/2*(c*sqrt((b^2 - 4*a*c)/c^2)*e - (2*c*x + b)*e)/c)*e
^(1/2*(c*sqrt((b^2 - 4*a*c)/c^2)*e + 2*c*d - b*e)/c) - ((b^3*c - 3*a*b*c^2)
*sqrt((b^2 - 4*a*c)/c^2)*e^2 + (b^4 - 5*a*b^2*c + 4*a^2*c^2)*e^2)*Ei(1/2*(c
*sqrt((b^2 - 4*a*c)/c^2)*e + (2*c*x + b)*e)/c)*e^(-1/2*(c*sqrt((b^2 - 4*a*c
)/c^2)*e - 2*c*d + b*e)/c) + 2*(b^2*c^2 - 4*a*c^3 + (b^3*c - 4*a*b*c^2 - (b
^2*c^2 - 4*a*c^3)*x)*e)*e^(x*e + d))*e^(-2)/(b^2*c^3 - 4*a*c^4)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$e^{d}\int\frac{x^{3}e^{ex}}{a+bx+cx^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)*x**3/(c*x**2+b*x+a),x)
```

```
[Out] exp(d)*Integral(x**3*exp(e*x)/(a + b*x + c*x**2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)*x^3/(c*x^2+b*x+a),x, algorithm="giac")
```

```
[Out] integrate(x^3*e^(x*e + d)/(c*x^2 + b*x + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,\mathrm{e}^{d+e\,x}}{c\,x^2+b\,x+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*exp(d + e*x))/(a + b*x + c*x^2),x)
[Out] int((x^3*exp(d + e*x))/(a + b*x + c*x^2), x)
```

3.473 $\int \frac{4^x}{a+2^x b} \, dx$

Optimal. Leaf size=30

$$\frac{2^x}{b\log(2)} - \frac{a\log\left(a+2^x b\right)}{b^2\log(2)}$$

```
[Out] 2^x/b/ln(2)-a*ln(a+2^x*b)/b^2/ln(2)
```

Rubi [A]
time = 0.03, antiderivative size = 30, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2280, 45}

$$\frac{2^x}{b\log(2)} - \frac{a\log\left(a+b2^x\right)}{b^2\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[4^x/(a + 2^x*b),x]
```

```
[Out] 2^x/(b*Log[2]) - (a*Log[a + 2^x*b])/(b^2*Log[2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{4^x}{a+2^x b} \, dx &= \frac{\text{Subst}\left(\int \frac{x}{a+bx} \, dx, x, 2^x\right)}{\log(2)}\\
&= \frac{\text{Subst}\left(\int \left(\frac{1}{b} - \frac{a}{b(a+bx)}\right) \, dx, x, 2^x\right)}{\log(2)}\\
&= \frac{2^x}{b\log(2)} - \frac{a\log\left(a+2^x b\right)}{b^2\log(2)}
\end{aligned}$$

Mathematica [A]
time = 0.09, size = 27, normalized size = 0.90

$$\frac{\frac{2^x}{b}-\frac{a\log(a+2^xb)}{b^2}}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[4^x/(a + 2^x*b),x]
[Out] (2^x/b - (a*Log[a + 2^x*b])/b^2)/Log[2]
```

Maple [A]
time = 0.02, size = 33, normalized size = 1.10

method	result	size
risch	$\frac{2^x}{b\ln(2)}-\frac{a\ln\left(2^x+\frac{a}{b}\right)}{\ln(2)b^2}$	33
norman	$\frac{e^{x\ln(2)}}{\ln(2)b}-\frac{a\ln\left(a+e^{x\ln(2)}b\right)}{\ln(2)b^2}$	35

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a+2^x*b),x,method=_RETURNVERBOSE)
[Out] 2^x/b/ln(2)-1/ln(2)/b^2*a*ln(2^x+a/b)
```

Maxima [A]
time = 0.48, size = 30, normalized size = 1.00

$$\frac{2^x}{b\log(2)}-\frac{a\log(2^xb+a)}{b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a+2^x*b),x, algorithm="maxima")
[Out] 2^x/(b*log(2)) - a*log(2^x*b + a)/(b^2*log(2))
```

Fricas [A]
time = 0.36, size = 25, normalized size = 0.83

$$\frac{2^xb-a\log(2^xb+a)}{b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a+2^x*b),x, algorithm="fricas")
[Out] (2^x*b - a*log(2^x*b + a))/(b^2*log(2))
```

Sympy [A]
time = 0.14, size = 41, normalized size = 1.37

$$-\frac{a\log\left(\frac{a}{b}+e^{\frac{x\log(4)}{2}}\right)}{b^2\log(2)}+\begin{cases}\frac{e^{\frac{x\log(4)}{2}}}{b\log(2)} & \text{for } b\log(2)\neq 0\\ \frac{x}{b} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4**x/(a+2**x*b),x)
```

```
[Out] -a*log(a/b + exp(x*log(4)/2))/(b**2*log(2)) + Piecewise((exp(x*log(4)/2)/(b
*log(2)), Ne(b*log(2), 0)), (x/b, True))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a+2^x*b),x, algorithm="giac")
```

```
[Out] integrate(4^x/(2^x*b + a), x)
```

Mupad [B]
time = 3.60, size = 26, normalized size = 0.87

$$-\frac{a\,\ln\left(a+2^x\,b\right)-2^x\,b}{b^2\,\ln\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a + 2^x*b),x)
```

```
[Out] -(a*log(a + 2^x*b) - 2^x*b)/(b^2*log(2))
```

3.474 $\int \frac{2^{2x}}{a+2^x b}\,dx$

Optimal. Leaf size=30

$$\frac{2^x}{b\log(2)}-\frac{a\log\left(a+2^x b\right)}{b^2\log(2)}$$

[Out] 2^x/b/ln(2)-a*ln(a+2^x*b)/b^2/ln(2)

Rubi [A]

time = 0.02, antiderivative size = 30, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2280, 45}

$$\frac{2^x}{b\log(2)}-\frac{a\log\left(a+b2^x\right)}{b^2\log(2)}$$

Antiderivative was successfully verified.

[In] Int[2^(2*x)/(a + 2^x*b),x]

[Out] 2^x/(b*Log[2]) - (a*Log[a + 2^x*b])/(b^2*Log[2])

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{2^{2x}}{a+2^x b}\,dx &= \frac{\text{Subst}\left(\int \frac{x}{a+bx}\,dx,x,2^x\right)}{\log(2)}\\ &= \frac{\text{Subst}\left(\int \left(\frac{1}{b}-\frac{a}{b(a+bx)}\right)\,dx,x,2^x\right)}{\log(2)}\\ &= \frac{2^x}{b\log(2)}-\frac{a\log\left(a+2^x b\right)}{b^2\log(2)}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 27, normalized size = 0.90

$$\frac{\frac{2^x}{b}-\frac{a\log(a+2^xb)}{b^2}}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^(2*x)/(a + 2^x*b),x]
[Out] (2^x/b - (a*Log[a + 2^x*b])/b^2)/Log[2]
```

Maple [A]
time = 0.02, size = 33, normalized size = 1.10

method	result	size
risch	$\frac{2^x}{b\ln(2)}-\frac{a\ln\left(2^x+\frac{a}{b}\right)}{\ln(2)b^2}$	33
norman	$\frac{\mathrm{e}^{x\ln(2)}}{\ln(2)b}-\frac{a\ln\left(a+\mathrm{e}^{x\ln(2)}b\right)}{\ln(2)b^2}$	35

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a+2^x*b),x,method=_RETURNVERBOSE)
[Out] 2^x/b/ln(2)-1/ln(2)/b^2*a*ln(2^x+a/b)
```

Maxima [A]
time = 0.28, size = 30, normalized size = 1.00

$$\frac{2^x}{b\log(2)}-\frac{a\log(2^xb+a)}{b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a+2^x*b),x, algorithm="maxima")
[Out] 2^x/(b*log(2)) - a*log(2^x*b + a)/(b^2*log(2))
```

Fricas [A]
time = 0.38, size = 25, normalized size = 0.83

$$\frac{2^xb-a\log(2^xb+a)}{b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a+2^x*b),x, algorithm="fricas")
[Out] (2^x*b - a*log(2^x*b + a))/(b^2*log(2))
```

Sympy [**A**]
time = 0.06, size = 31, normalized size = 1.03

$$-\frac{a\log\left(2^{x}+\frac{a}{b}\right)}{b^{2}\log\left(2\right)}+\begin{cases}\frac{2^{x}}{b\log\left(2\right)} & \text{for}\: b\log\left(2\right)\neq 0\\ \frac{x}{b} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**(2*x)/(a+2**x*b),x)
```

```
[Out] -a*log(2**x + a/b)/(b**2*log(2)) + Piecewise((2**x/(b*log(2)), Ne(b*log(2),
 0)), (x/b, True))
```

Giac [**A**]
time = 1.63, size = 31, normalized size = 1.03

$$\frac{2^{x}}{b\log\left(2\right)}-\frac{a\log\left(|2^{x}b+a|\right)}{b^{2}\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a+2^x*b),x, algorithm="giac")
```

```
[Out] 2^x/(b*log(2)) - a*log(abs(2^x*b + a))/(b^2*log(2))
```

Mupad [**B**]
time = 3.61, size = 26, normalized size = 0.87

$$-\frac{a\,\ln\left(a+2^{x}\,b\right)-2^{x}\,b}{b^{2}\,\ln\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a + 2^x*b),x)
```

```
[Out] -(a*log(a + 2^x*b) - 2^x*b)/(b^2*log(2))
```

3.475 $\int \frac{4^x}{a-2^x b} \, dx$

Optimal. Leaf size=32

$$-\frac{2^x}{b\log(2)}-\frac{a\log\left(a-2^xb\right)}{b^2\log(2)}$$

```
[Out] -2^x/b/ln(2)-a*ln(a-2^x*b)/b^2/ln(2)
```

Rubi [A]

time = 0.03, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2280, 45}

$$-\frac{a\log\left(a-b2^x\right)}{b^2\log(2)}-\frac{2^x}{b\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[4^x/(a - 2^x*b),x]
```

```
[Out] -(2^x/(b*Log[2])) - (a*Log[a - 2^x*b])/(b^2*Log[2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{4^x}{a-2^xb}\,dx &= \frac{\text{Subst}\left(\int \frac{x}{a-bx}\,dx,x,2^x\right)}{\log(2)}\\
&= \frac{\text{Subst}\left(\int \left(-\frac{1}{b}-\frac{a}{b(-a+bx)}\right)\,dx,x,2^x\right)}{\log(2)}\\
&= -\frac{2^x}{b\log(2)}-\frac{a\log\left(a-2^xb\right)}{b^2\log(2)}
\end{aligned}$$

Mathematica [A]
time = 0.11, size = 26, normalized size = 0.81

$$-\frac{2^x b + a \log\left(a - 2^x b\right)}{b^2 \log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[4^x/(a - 2^x*b),x]
[Out] -((2^x*b + a*Log[a - 2^x*b])/(b^2*Log[2]))
```

Maple [A]
time = 0.02, size = 35, normalized size = 1.09

method	result	size
risch	$-\frac{2^x}{b\ln(2)} - \frac{a\ln\left(2^x - \frac{a}{b}\right)}{\ln(2)b^2}$	35
norman	$-\frac{e^{x\ln(2)}}{\ln(2)b} - \frac{a\ln\left(a - e^{x\ln(2)}b\right)}{\ln(2)b^2}$	37

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a-2^x*b),x,method=_RETURNVERBOSE)
[Out] -2^x/b/ln(2)-a/ln(2)/b^2*ln(2^x-a/b)
```

Maxima [A]
time = 0.48, size = 33, normalized size = 1.03

$$-\frac{2^x}{b\log(2)} - \frac{a\log\left(2^x b - a\right)}{b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a-2^x*b),x, algorithm="maxima")
[Out] -2^x/(b*log(2)) - a*log(2^x*b - a)/(b^2*log(2))
```

Fricas [A]
time = 0.39, size = 27, normalized size = 0.84

$$-\frac{2^x b + a\log\left(2^x b - a\right)}{b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a-2^x*b),x, algorithm="fricas")
[Out] -(2^x*b + a*log(2^x*b - a))/(b^2*log(2))
```

Sympy [A]
time = 0.14, size = 44, normalized size = 1.38

$$-\frac{a\log\left(-\frac{a}{b}+e^{\frac{x\log(4)}{2}}\right)}{b^2\log(2)}+\begin{cases}-\frac{e^{\frac{x\log(4)}{2}}}{b\log(2)} & \text{for } b\log(2)\neq 0\\ -\frac{x}{b} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4**x/(a-2**x*b),x)
```

```
[Out] -a*log(-a/b + exp(x*log(4)/2))/(b**2*log(2)) + Piecewise((-exp(x*log(4)/2)/
(b*log(2)), Ne(b*log(2), 0)), (-x/b, True))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a-2^x*b),x, algorithm="giac")
```

```
[Out] integrate(-4^x/(2^x*b - a), x)
```

Mupad [B]
time = 3.61, size = 27, normalized size = 0.84

$$-\frac{2^x\,b+a\,\ln\left(2^x\,b-a\right)}{b^2\,\ln\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a - 2^x*b),x)
```

```
[Out] -(2^x*b + a*log(2^x*b - a))/(b^2*log(2))
```

3.476 $\int \frac{2^{2x}}{a-2^x b}\,dx$

Optimal. Leaf size=32

$$-\frac{2^x}{b\log(2)}-\frac{a\log\left(a-2^x b\right)}{b^2\log(2)}$$

```
[Out] -2^x/b/ln(2)-a*ln(a-2^x*b)/b^2/ln(2)
```

Rubi [A]

time = 0.03, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {2280, 45}

$$-\frac{a\log\left(a-b2^x\right)}{b^2\log(2)}-\frac{2^x}{b\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^(2*x)/(a - 2^x*b),x]
[Out] -(2^x/(b*Log[2])) - (a*Log[a - 2^x*b])/(b^2*Log[2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{2^{2x}}{a-2^x b}\,dx &= \frac{\text{Subst}\left(\int \frac{x}{a-bx}\,dx,x,2^x\right)}{\log(2)}\\
&= \frac{\text{Subst}\left(\int \left(-\frac{1}{b}-\frac{a}{b(-a+bx)}\right)\,dx,x,2^x\right)}{\log(2)}\\
&= -\frac{2^x}{b\log(2)}-\frac{a\log\left(a-2^x b\right)}{b^2\log(2)}
\end{aligned}$$

Mathematica [A]
time = 0.01, size = 26, normalized size = 0.81

$$-\frac{2^x b+a \log \left(a-2^x b\right)}{b^2 \log (2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^(2*x)/(a - 2^x*b),x]
[Out] -((2^x*b + a*Log[a - 2^x*b])/(b^2*Log[2]))
```

Maple [A]
time = 0.01, size = 35, normalized size = 1.09

method	result	size
risch	$-\frac{2^x}{b\ln(2)}-\frac{a\ln\left(2^x-\frac{a}{b}\right)}{\ln(2)b^2}$	35
norman	$-\frac{e^{x\ln(2)}}{\ln(2)b}-\frac{a\ln\left(a-e^{x\ln(2)}b\right)}{\ln(2)b^2}$	37

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a-2^x*b),x,method=_RETURNVERBOSE)
[Out] -2^x/b/ln(2)-a/ln(2)/b^2*ln(2^x-a/b)
```

Maxima [A]
time = 0.29, size = 33, normalized size = 1.03

$$-\frac{2^x}{b\log(2)}-\frac{a\log\left(2^x b-a\right)}{b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a-2^x*b),x, algorithm="maxima")
[Out] -2^x/(b*log(2)) - a*log(2^x*b - a)/(b^2*log(2))
```

Fricas [A]
time = 0.37, size = 27, normalized size = 0.84

$$-\frac{2^x b+a\log\left(2^x b-a\right)}{b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a-2^x*b),x, algorithm="fricas")
[Out] -(2^x*b + a*log(2^x*b - a))/(b^2*log(2))
```

Sympy [A]
time = 0.07, size = 34, normalized size = 1.06

$$-\frac{a\log\left(2^{x}-\frac{a}{b}\right)}{b^{2}\log\left(2\right)}+\begin{cases}-\frac{2^{x}}{b\log\left(2\right)} & \text{for}\ b\log\left(2\right)\neq 0\\ -\frac{x}{b} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**(2*x)/(a-2**x*b),x)
```

```
[Out] -a*log(2**x - a/b)/(b**2*log(2)) + Piecewise((-2**x/(b*log(2)), Ne(b*log(2)
, 0)), (-x/b, True))
```

Giac [A]
time = 1.94, size = 34, normalized size = 1.06

$$-\frac{2^{x}}{b\log\left(2\right)}-\frac{a\log\left(\left|2^{x}b-a\right|\right)}{b^{2}\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a-2^x*b),x, algorithm="giac")
```

```
[Out] -2^x/(b*log(2)) - a*log(abs(2^x*b - a))/(b^2*log(2))
```

Mupad [B]
time = 3.58, size = 27, normalized size = 0.84

$$-\frac{2^{x}\,b+a\,\ln\left(2^{x}\,b-a\right)}{b^{2}\,\ln\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a - 2^x*b),x)
```

```
[Out] -(2^x*b + a*log(2^x*b - a))/(b^2*log(2))
```

3.477 $\int \frac{4^x}{a+2^{-x}b} \, dx$

Optimal. Leaf size=58

$$\frac{b^2x}{a^3} + \frac{2^{-1+2x}}{a\log(2)} - \frac{2^x b}{a^2\log(2)} + \frac{b^2\log\left(a+2^{-x}b\right)}{a^3\log(2)}$$

```
[Out] b^2*x/a^3+2^(-1+2*x)/a/ln(2)-2^x*b/a^2/ln(2)+b^2*ln(a+b/(2^x))/a^3/ln(2)
```

Rubi [A]
time = 0.04, antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {2280, 46}

$$\frac{b^2x}{a^3} + \frac{b^2\log\left(a+b2^{-x}\right)}{a^3\log(2)} - \frac{b2^x}{a^2\log(2)} + \frac{2^{2x-1}}{a\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[4^x/(a + b/2^x),x]
```

```
[Out] (b^2*x)/a^3 + 2^(-1 + 2*x)/(a*Log[2]) - (2^x*b)/(a^2*Log[2]) + (b^2*Log[a +
 b/2^x])/(a^3*Log[2])
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{4^x}{a+2^{-x}b}\,dx = -\frac{\text{Subst}\left(\int \frac{1}{x^3(a+bx)}\,dx, x, 2^{-x}\right)}{\log(2)}$$
$$= -\frac{\text{Subst}\left(\int \left(\frac{1}{ax^3} - \frac{b}{a^2x^2} + \frac{b^2}{a^3x} - \frac{b^3}{a^3(a+bx)}\right)\,dx, x, 2^{-x}\right)}{\log(2)}$$
$$= \frac{b^2x}{a^3} + \frac{2^{-1+2x}}{a\log(2)} - \frac{2^x b}{a^2\log(2)} + \frac{b^2\log\left(a+2^{-x}b\right)}{a^3\log(2)}$$

Mathematica [A]
time = 0.11, size = 36, normalized size = 0.62

$$\frac{2^x a(2^x a - 2b) + 2b^2\log\left(2^x a + b\right)}{a^3\log(4)}$$

Antiderivative was successfully verified.

```
[In] Integrate[4^x/(a + b/2^x),x]
```

```
[Out] (2^x*a*(2^x*a - 2*b) + 2*b^2*Log[2^x*a + b])/(a^3*Log[4])
```

Maple [A]
time = 0.02, size = 50, normalized size = 0.86

method	result	size
risch	$\frac{2^{2x}}{2a\ln(2)} - \frac{2^x b}{a^2\ln(2)} + \frac{b^2\ln\left(2^x+\frac{b}{a}\right)}{a^3\ln(2)}$	50
norman	$\frac{e^{2x\ln(2)}}{2a\ln(2)} - \frac{b\,e^{x\ln(2)}}{a^2\ln(2)} + \frac{b^2\ln\left(a\,e^{x\ln(2)}+b\right)}{a^3\ln(2)}$	54

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a+b/(2^x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/a/ln(2)*(2^x)^2-2^x*b/a^2/ln(2)+1/a^3/ln(2)*b^2*ln(2^x+1/a*b)
```

Maxima [A]
time = 0.48, size = 59, normalized size = 1.02

$$\frac{b^2x}{a^3} - \frac{\left(2^{-x+1}b - a\right)2^{2x-1}}{a^2\log(2)} + \frac{b^2\log\left(a+\frac{b}{2^x}\right)}{a^3\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a+b/(2^x)),x, algorithm="maxima")
```

```
[Out] b^2*x/a^3 - (2^(-x + 1)*b - a)*2^(2*x - 1)/(a^2*log(2)) + b^2*log(a + b/2^x
)/(a^3*log(2))
```

Fricas [A]
time = 0.35, size = 39, normalized size = 0.67

$$\frac{2^{2\,x}a^{2}-2\cdot 2^{x}ab+2\,b^{2}\log\left(2^{x}a+b\right)}{2\,a^{3}\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a+b/(2^x)),x, algorithm="fricas")
[Out] 1/2*(2^(2*x)*a^2 - 2*2^x*a*b + 2*b^2*log(2^x*a + b))/(a^3*log(2))
```

Sympy [A]
time = 0.20, size = 90, normalized size = 1.55

$$\begin{cases}\frac{2^{2x}a^{2}\log\left(2\right)-2\cdot 2^{x}ab\log\left(2\right)}{2a^{3}\log\left(2\right)^{2}} & \text{for}\ a^{3}\log\left(2\right)^{2}\neq 0\\ x\left(-\frac{b^{2}}{a^{3}}+\frac{a^{2}-ab+b^{2}}{a^{3}}\right) & \text{otherwise}\end{cases}+\frac{b^{2}x}{a^{3}}+\frac{b^{2}\log\left(\frac{a}{b}+2^{-x}\right)}{a^{3}\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4**x/(a+b/(2**x)),x)
[Out] Piecewise((((2**(2*x)*a**2*log(2) - 2*2**x*a*b*log(2))/(2*a**3*log(2)**2), N
e(a**3*log(2)**2, 0)), (x*(-b**2/a**3 + (a**2 - a*b + b**2)/a**3), True)) +
 b**2*x/a**3 + b**2*log(a/b + 2**(-x))/(a**3*log(2))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a+b/(2^x)),x, algorithm="giac")
[Out] integrate(4^x/(a + b/2^x), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{4^{x}}{a+\frac{b}{2^{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a + b/2^x),x)
[Out] int(4^x/(a + b/2^x), x)
```

3.478 $\int \frac{2^{2x}}{a+2^{-x}b}\,dx$

Optimal. Leaf size=58

$$\frac{b^2x}{a^3}+\frac{2^{-1+2x}}{a\log(2)}-\frac{2^xb}{a^2\log(2)}+\frac{b^2\log\left(a+2^{-x}b\right)}{a^3\log(2)}$$

```
[Out] b^2*x/a^3+2^(-1+2*x)/a/ln(2)-2^x*b/a^2/ln(2)+b^2*ln(a+b/(2^x))/a^3/ln(2)
```

Rubi [A]
time = 0.04, antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2280, 46}

$$\frac{b^2x}{a^3}+\frac{b^2\log\left(a+b2^{-x}\right)}{a^3\log(2)}-\frac{b2^x}{a^2\log(2)}+\frac{2^{2x-1}}{a\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^(2*x)/(a + b/2^x),x]
```

```
[Out] (b^2*x)/a^3 + 2^(-1 + 2*x)/(a*Log[2]) - (2^x*b)/(a^2*Log[2]) + (b^2*Log[a +
 b/2^x])/(a^3*Log[2])
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^{2x}}{a+2^{-x}b}\,dx = -\frac{\text{Subst}\left(\int \frac{1}{x^3(a+bx)}\,dx, x, 2^{-x}\right)}{\log(2)}$$
$$= -\frac{\text{Subst}\left(\int \left(\frac{1}{ax^3}-\frac{b}{a^2x^2}+\frac{b^2}{a^3x}-\frac{b^3}{a^3(a+bx)}\right)\,dx, x, 2^{-x}\right)}{\log(2)}$$
$$= \frac{b^2x}{a^3}+\frac{2^{-1+2x}}{a\log(2)}-\frac{2^xb}{a^2\log(2)}+\frac{b^2\log\left(a+2^{-x}b\right)}{a^3\log(2)}$$

Mathematica [A]
time = 0.01, size = 36, normalized size = 0.62

$$\frac{2^xa(2^xa-2b)+2b^2\log\left(2^xa+b\right)}{a^3\log(4)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^(2*x)/(a + b/2^x),x]
[Out] (2^x*a*(2^x*a - 2*b) + 2*b^2*Log[2^x*a + b])/(a^3*Log[4])
```

Maple [A]
time = 0.02, size = 50, normalized size = 0.86

method	result	size
risch	$\frac{2^{2x}}{2a\ln(2)}-\frac{2^xb}{a^2\ln(2)}+\frac{b^2\ln\left(2^x+\frac{b}{a}\right)}{a^3\ln(2)}$	50
norman	$\frac{e^{2x\ln(2)}}{2a\ln(2)}-\frac{b\,e^{x\ln(2)}}{a^2\ln(2)}+\frac{b^2\ln\left(a\,e^{x\ln(2)}+b\right)}{a^3\ln(2)}$	54

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a+b/(2^x)),x,method=_RETURNVERBOSE)
[Out] 1/2/a/ln(2)*(2^x)^2-2^x*b/a^2/ln(2)+1/a^3/ln(2)*b^2*ln(2^x+1/a*b)
```

Maxima [A]
time = 0.28, size = 59, normalized size = 1.02

$$\frac{b^2x}{a^3}-\frac{(2^{-x+1}b-a)2^{2\,x-1}}{a^2\log\left(2\right)}+\frac{b^2\log\left(a+\frac{b}{2^x}\right)}{a^3\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a+b/(2^x)),x, algorithm="maxima")
```

```
[Out] b^2*x/a^3 - (2^(-x + 1)*b - a)*2^(2*x - 1)/(a^2*log(2)) + b^2*log(a + b/2^x
)/(a^3*log(2))
```

Fricas [A]
time = 0.37, size = 39, normalized size = 0.67

$$\frac{2^{2x}a^2 - 2\cdot 2^x ab + 2\,b^2 \log\left(2^x a + b\right)}{2\,a^3 \log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a+b/(2^x)),x, algorithm="fricas")
[Out] 1/2*(2^(2*x)*a^2 - 2*2^x*a*b + 2*b^2*log(2^x*a + b))/(a^3*log(2))
```

Sympy [A]
time = 0.10, size = 90, normalized size = 1.55

$$\begin{cases} \frac{2^{2x}a^2\log\left(2\right) - 2\cdot 2^x ab\log\left(2\right)}{2a^3\log\left(2\right)^2} & \text{for}\ a^3\log\left(2\right)^2 \neq 0 \\ x\left(-\frac{b^2}{a^3} + \frac{a^2 - ab + b^2}{a^3}\right) & \text{otherwise} \end{cases} + \frac{b^2x}{a^3} + \frac{b^2\log\left(\frac{a}{b} + 2^{-x}\right)}{a^3\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**(2*x)/(a+b/(2**x)),x)
[Out] Piecewise(((2**(2*x)*a**2*log(2) - 2*2**x*a*b*log(2))/(2*a**3*log(2)**2), N
e(a**3*log(2)**2, 0)), (x*(-b**2/a**3 + (a**2 - a*b + b**2)/a**3), True)) +
 b**2*x/a**3 + b**2*log(a/b + 2**(-x))/(a**3*log(2))
```

Giac [A]
time = 2.34, size = 48, normalized size = 0.83

$$\frac{b^2\log\left(|2^x a + b|\right)}{a^3\log\left(2\right)} + \frac{2^{2x}a\log\left(2\right) - 2\cdot 2^x b\log\left(2\right)}{2\,a^2\log\left(2\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a+b/(2^x)),x, algorithm="giac")
[Out] b^2*log(abs(2^x*a + b))/(a^3*log(2)) + 1/2*(2^(2*x)*a*log(2) - 2*2^x*b*log(
2))/(a^2*log(2)^2)
```

Mupad [B]
time = 3.68, size = 47, normalized size = 0.81

$$\frac{2^{2\,x}}{2\,a\,\ln\left(2\right)} - \frac{2^x\,b}{a^2\,\ln\left(2\right)} + \frac{b^2\,\ln\left(b + 2^x\,a\right)}{a^3\,\ln\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a + b/2^x),x)
[Out] 2^(2*x)/(2*a*log(2)) - (2^x*b)/(a^2*log(2)) + (b^2*log(b + 2^x*a))/(a^3*log
(2))
```

3.479 $\int \frac{4^x}{a-2^{-x}b} dx$

Optimal. Leaf size=58

$$\frac{b^2x}{a^3} + \frac{2^{-1+2x}}{a\log(2)} + \frac{2^x b}{a^2\log(2)} + \frac{b^2\log\left(a-2^{-x}b\right)}{a^3\log(2)}$$

```
[Out] b^2*x/a^3+2^(-1+2*x)/a/ln(2)+2^x*b/a^2/ln(2)+b^2*ln(a-b/(2^x))/a^3/ln(2)
```

Rubi [A]
time = 0.04, antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {2280, 46}

$$\frac{b^2x}{a^3} + \frac{b^2\log\left(a-b2^{-x}\right)}{a^3\log(2)} + \frac{b2^x}{a^2\log(2)} + \frac{2^{2x-1}}{a\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[4^x/(a - b/2^x),x]
```

```
[Out] (b^2*x)/a^3 + 2^(-1 + 2*x)/(a*Log[2]) + (2^x*b)/(a^2*Log[2]) + (b^2*Log[a -
 b/2^x])/(a^3*Log[2])
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{4^x}{a-2^{-x}b}\,dx = -\frac{\text{Subst}\left(\int \frac{1}{x^3(a-bx)}\,dx, x, 2^{-x}\right)}{\log(2)}$$
$$= -\frac{\text{Subst}\left(\int \left(\frac{1}{ax^3}+\frac{b}{a^2x^2}+\frac{b^2}{a^3x}+\frac{b^3}{a^3(a-bx)}\right)dx, x, 2^{-x}\right)}{\log(2)}$$
$$= \frac{b^2x}{a^3}+\frac{2^{-1+2x}}{a\log(2)}+\frac{2^xb}{a^2\log(2)}+\frac{b^2\log\left(a-2^{-x}b\right)}{a^3\log(2)}$$

Mathematica [A]
time = 0.10, size = 38, normalized size = 0.66

$$\frac{2^xa(2^xa+2b)+2b^2\log\left(2^xa-b\right)}{a^3\log(4)}$$

Antiderivative was successfully verified.

```
[In] Integrate[4^x/(a - b/2^x),x]
[Out] (2^x*a*(2^x*a + 2*b) + 2*b^2*Log[2^x*a - b])/(a^3*Log[4])
```

Maple [A]
time = 0.02, size = 50, normalized size = 0.86

method	result	size
risch	$\frac{2^{2x}}{2a\ln(2)}+\frac{2^xb}{a^2\ln(2)}+\frac{b^2\ln\left(2^x-\frac{b}{a}\right)}{a^3\ln(2)}$	50
norman	$\frac{b\,e^{x\ln(2)}}{a^2\ln(2)}+\frac{e^{2x\ln(2)}}{2a\ln(2)}+\frac{b^2\ln\left(a\,e^{x\ln(2)}-b\right)}{a^3\ln(2)}$	55

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a-b/(2^x)),x,method=_RETURNVERBOSE)
[Out] 1/2/a/ln(2)*(2^x)^2+2^x*b/a^2/ln(2)+1/a^3/ln(2)*b^2*ln(2^x-1/a*b)
```

Maxima [A]
time = 0.53, size = 58, normalized size = 1.00

$$\frac{b^2x}{a^3}+\frac{(2^{-x+1}b+a)2^{2x-1}}{a^2\log(2)}+\frac{b^2\log\left(-a+\frac{b}{2^x}\right)}{a^3\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a-b/(2^x)),x, algorithm="maxima")
```

```
[Out] b^2*x/a^3 + (2^(-x + 1)*b + a)*2^(2*x - 1)/(a^2*log(2)) + b^2*log(-a + b/2^
x)/(a^3*log(2))
```

Fricas [A]
time = 0.35, size = 41, normalized size = 0.71

$$\frac{2^{2x}a^2 + 2\cdot 2^x ab + 2\, b^2 \log\left(2^x a - b\right)}{2\, a^3 \log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a-b/(2^x)),x, algorithm="fricas")
[Out] 1/2*(2^(2*x)*a^2 + 2*2^x*a*b + 2*b^2*log(2^x*a - b))/(a^3*log(2))
```

Sympy [A]
time = 0.17, size = 90, normalized size = 1.55

$$\begin{cases} \frac{2^{2x}a^2\log\left(2\right)+2\cdot 2^x ab\log\left(2\right)}{2a^3\log\left(2\right)^2} & \text{for } a^3\log\left(2\right)^2 \neq 0 \\ x\left(-\frac{b^2}{a^3}+\frac{a^2+ab+b^2}{a^3}\right) & \text{otherwise} \end{cases} + \frac{b^2 x}{a^3} + \frac{b^2\log\left(-\frac{a}{b}+2^{-x}\right)}{a^3\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4**x/(a-b/(2**x)),x)
[Out] Piecewise((((2**(2*x)*a**2*log(2) + 2*2**x*a*b*log(2))/(2*a**3*log(2)**2), N
e(a**3*log(2)**2, 0)), (x*(-b**2/a**3 + (a**2 + a*b + b**2)/a**3), True)) +
 b**2*x/a**3 + b**2*log(-a/b + 2**(-x))/(a**3*log(2))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a-b/(2^x)),x, algorithm="giac")
[Out] integrate(4^x/(a - b/2^x), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{4^x}{a-\frac{b}{2^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a - b/2^x),x)
[Out] int(4^x/(a - b/2^x), x)
```

3.480 $\int \frac{2^{2x}}{a-2^{-x}b}\,dx$

Optimal. Leaf size=58

$$\frac{b^2x}{a^3}+\frac{2^{-1+2x}}{a\log(2)}+\frac{2^xb}{a^2\log(2)}+\frac{b^2\log\left(a-2^{-x}b\right)}{a^3\log(2)}$$

```
[Out] b^2*x/a^3+2^(-1+2*x)/a/ln(2)+2^x*b/a^2/ln(2)+b^2*ln(a-b/(2^x))/a^3/ln(2)
```

Rubi [A]
time = 0.04, antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2280, 46}

$$\frac{b^2x}{a^3}+\frac{b^2\log\left(a-b2^{-x}\right)}{a^3\log(2)}+\frac{b2^x}{a^2\log(2)}+\frac{2^{2x-1}}{a\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^(2*x)/(a - b/2^x),x]
```

```
[Out] (b^2*x)/a^3 + 2^(-1 + 2*x)/(a*Log[2]) + (2^x*b)/(a^2*Log[2]) + (b^2*Log[a -
 b/2^x])/(a^3*Log[2])
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^{2x}}{a-2^{-x}b}\,dx = -\frac{\text{Subst}\left(\int \frac{1}{x^3(a-bx)}\,dx, x, 2^{-x}\right)}{\log(2)}$$
$$= -\frac{\text{Subst}\left(\int \left(\frac{1}{ax^3}+\frac{b}{a^2x^2}+\frac{b^2}{a^3x}+\frac{b^3}{a^3(a-bx)}\right)\,dx, x, 2^{-x}\right)}{\log(2)}$$
$$= \frac{b^2x}{a^3}+\frac{2^{-1+2x}}{a\log(2)}+\frac{2^xb}{a^2\log(2)}+\frac{b^2\log\left(a-2^{-x}b\right)}{a^3\log(2)}$$

Mathematica [A]
time = 0.01, size = 38, normalized size = 0.66

$$\frac{2^xa(2^xa+2b)+2b^2\log\left(2^xa-b\right)}{a^3\log(4)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^(2*x)/(a - b/2^x),x]
[Out] (2^x*a*(2^x*a + 2*b) + 2*b^2*Log[2^x*a - b])/(a^3*Log[4])
```

Maple [A]
time = 0.02, size = 50, normalized size = 0.86

method	result	size
risch	$\frac{2^{2x}}{2a\ln(2)}+\frac{2^xb}{a^2\ln(2)}+\frac{b^2\ln\left(2^x-\frac{b}{a}\right)}{a^3\ln(2)}$	50
norman	$\frac{b\,{\mathrm e}^{x\ln(2)}}{a^2\ln(2)}+\frac{{\mathrm e}^{2x\ln(2)}}{2a\ln(2)}+\frac{b^2\ln\left(a\,{\mathrm e}^{x\ln(2)}-b\right)}{a^3\ln(2)}$	55

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a-b/(2^x)),x,method=_RETURNVERBOSE)
[Out] 1/2/a/ln(2)*(2^x)^2+2^x*b/a^2/ln(2)+1/a^3/ln(2)*b^2*ln(2^x-1/a*b)
```

Maxima [A]
time = 0.28, size = 58, normalized size = 1.00

$$\frac{b^2x}{a^3}+\frac{\left(2^{-x+1}b+a\right)2^{2x-1}}{a^2\log(2)}+\frac{b^2\log\left(-a+\frac{b}{2^x}\right)}{a^3\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a-b/(2^x)),x, algorithm="maxima")
```

```
[Out] b^2*x/a^3 + (2^(-x + 1)*b + a)*2^(2*x - 1)/(a^2*log(2)) + b^2*log(-a + b/2^
x)/(a^3*log(2))
```

Fricas [A]
time = 0.39, size = 41, normalized size = 0.71

$$\frac{2^{2\,x}a^2 + 2\cdot 2^x ab + 2\,b^2\log\left(2^x a - b\right)}{2\,a^3\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a-b/(2^x)),x, algorithm="fricas")
```

```
[Out] 1/2*(2^(2*x)*a^2 + 2*2^x*a*b + 2*b^2*log(2^x*a - b))/(a^3*log(2))
```

Sympy [A]
time = 0.10, size = 90, normalized size = 1.55

$$\begin{cases}\frac{2^{2x}a^2\log\left(2\right)+2\cdot 2^x ab\log\left(2\right)}{2a^3\log\left(2\right)^2} & \text{for}\ a^3\log\left(2\right)^2\neq 0\\ x\left(-\frac{b^2}{a^3}+\frac{a^2+ab+b^2}{a^3}\right) & \text{otherwise}\end{cases} + \frac{b^2x}{a^3} + \frac{b^2\log\left(-\frac{a}{b}+2^{-x}\right)}{a^3\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**(2*x)/(a-b/(2**x)),x)
```

```
[Out] Piecewise(((2**(2*x)*a**2*log(2) + 2*2**x*a*b*log(2))/(2*a**3*log(2)**2), N
e(a**3*log(2)**2, 0)), (x*(-b**2/a**3 + (a**2 + a*b + b**2)/a**3), True)) +
 b**2*x/a**3 + b**2*log(-a/b + 2**(-x))/(a**3*log(2))
```

Giac [A]
time = 3.12, size = 50, normalized size = 0.86

$$\frac{b^2\log\left(\left|2^x a - b\right|\right)}{a^3\log\left(2\right)} + \frac{2^{2\,x}a\log\left(2\right) + 2\cdot 2^x b\log\left(2\right)}{2\,a^2\log\left(2\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a-b/(2^x)),x, algorithm="giac")
```

```
[Out] b^2*log(abs(2^x*a - b))/(a^3*log(2)) + 1/2*(2^(2*x)*a*log(2) + 2*2^x*b*log(
2))/(a^2*log(2)^2)
```

Mupad [B]
time = 3.65, size = 47, normalized size = 0.81

$$\frac{2^{2\,x}}{2\,a\,\ln\left(2\right)} + \frac{2^x\,b}{a^2\,\ln\left(2\right)} + \frac{b^2\,\ln\left(b - 2^x\,a\right)}{a^3\,\ln\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a - b/2^x),x)
```

```
[Out] 2^(2*x)/(2*a*log(2)) + (2^x*b)/(a^2*log(2)) + (b^2*log(b - 2^x*a))/(a^3*log
(2))
```

3.481 $\int \frac{2^x}{a+4^x b} \, dx$

Optimal. Leaf size=30

$$\frac{\tan^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(2)}$$

```
[Out] arctan(2^x*b^(1/2)/a^(1/2))/ln(2)/a^(1/2)/b^(1/2)
```

Rubi [A]

time = 0.02, antiderivative size = 30, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2281, 211}

$$\frac{\text{ArcTan}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x/(a + 4^x*b),x]
```

```
[Out] ArcTan[(2^x*Sqrt[b])/Sqrt[a]]/(Sqrt[a]*Sqrt[b]*Log[2])
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{2^x}{a+4^x b}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{a+bx^2}\,dx, x, 2^x\right)}{\log(2)}\\ &= \frac{\tan^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(2)}\end{aligned}$$

Mathematica [A]
time = 0.04, size = 30, normalized size = 1.00

$$\frac{\tan^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/(a + 4^x*b),x]
```

```
[Out] ArcTan[(2^x*Sqrt[b])/Sqrt[a]]/(Sqrt[a]*Sqrt[b]*Log[2])
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 52 vs. 2(22) = 44.
time = 0.02, size = 53, normalized size = 1.77

method	result	size
risch	$-\frac{\ln\left(2^x-\frac{a}{\sqrt{-ba}}\right)}{2\sqrt{-ba}\,\ln(2)}+\frac{\ln\left(2^x+\frac{a}{\sqrt{-ba}}\right)}{2\sqrt{-ba}\,\ln(2)}$	53

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a+4^x*b),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2/(-b*a)^(1/2)/ln(2)*ln(2^x-1/(-b*a)^(1/2)*a)+1/2/(-b*a)^(1/2)/ln(2)*ln(
2^x+1/(-b*a)^(1/2)*a)
```

Maxima [A]
time = 0.49, size = 21, normalized size = 0.70

$$\frac{\arctan\left(\frac{2^x b}{\sqrt{ab}}\right)}{\sqrt{ab}\,\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+4^x*b),x, algorithm="maxima")
```

```
[Out] arctan(2^x*b/sqrt(a*b))/(sqrt(a*b)*log(2))
```

Fricas [A]
time = 0.40, size = 86, normalized size = 2.87

$$\left[-\frac{\sqrt{-ab}\,\log\left(\frac{2^{2x}b-2\sqrt{-ab}\,2^x-a}{2^{2x}b+a}\right)}{2\,ab\log(2)},\,-\frac{\sqrt{ab}\,\arctan\left(\frac{\sqrt{ab}}{2^x b}\right)}{ab\log(2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+4^x*b),x, algorithm="fricas")
```

```
[Out] [-1/2*sqrt(-a*b)*log((2^(2*x)*b - 2*sqrt(-a*b)*2^x - a)/(2^(2*x)*b + a))/(a
*b*log(2)), -sqrt(a*b)*arctan(sqrt(a*b)/(2^x*b))/(a*b*log(2))]
```

Sympy [A]
time = 0.15, size = 29, normalized size = 0.97

$$\frac{\operatorname{RootSum}\left(4z^2ab+1,\left(i\mapsto i\log\left(2ia+e^{\frac{x\log(4)}{2}}\right)\right)\right)}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a+4**x*b),x)
```

```
[Out] RootSum(4*_z**2*a*b + 1, Lambda(_i, _i*log(2*_i*a + exp(x*log(4)/2))))/log(
2)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+4^x*b),x, algorithm="giac")
```

```
[Out] integrate(2^x/(4^x*b + a), x)
```

Mupad [B]
time = 3.54, size = 22, normalized size = 0.73

$$\frac{\operatorname{atan}\left(\frac{2^x\sqrt{b}}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a + 4^x*b),x)
```

```
[Out] atan((2^x*b^(1/2))/a^(1/2))/(a^(1/2)*b^(1/2)*log(2))
```

3.482 $\int \frac{2^x}{a+2^{2x}b}\,dx$

Optimal. Leaf size=30

$$\frac{\tan^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(2)}$$

[Out] arctan(2^x*b^(1/2)/a^(1/2))/ln(2)/a^(1/2)/b^(1/2)

Rubi [A]

time = 0.02, antiderivative size = 30, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {2281, 211}

$$\frac{\text{ArcTan}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(2)}$$

Antiderivative was successfully verified.

[In] Int[2^x/(a + 2^(2*x)*b),x]

[Out] ArcTan[(2^x*Sqrt[b])/Sqrt[a]]/(Sqrt[a]*Sqrt[b]*Log[2])

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{2^x}{a+2^{2x}b}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{a+bx^2}\,dx,x,2^x\right)}{\log(2)}\\ &= \frac{\tan^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(2)}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 30, normalized size = 1.00

$$\frac{\tan^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/(a + 2^(2*x)*b),x]
[Out] ArcTan[(2^x*Sqrt[b])/Sqrt[a]]/(Sqrt[a]*Sqrt[b]*Log[2])
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 52 vs. $2(22) = 44$.
time = 0.02, size = 53, normalized size = 1.77

method	result	size
risch	$-\frac{\ln\left(2^x-\frac{a}{\sqrt{-ba}}\right)}{2\sqrt{-ba}\,\ln(2)}+\frac{\ln\left(2^x+\frac{a}{\sqrt{-ba}}\right)}{2\sqrt{-ba}\,\ln(2)}$	53

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a+2^(2*x)*b),x,method=_RETURNVERBOSE)
[Out] -1/2/(-b*a)^(1/2)/ln(2)*ln(2^x-1/(-b*a)^(1/2)*a)+1/2/(-b*a)^(1/2)/ln(2)*ln(
2^x+1/(-b*a)^(1/2)*a)
```

Maxima [A]
time = 0.49, size = 21, normalized size = 0.70

$$\frac{\arctan\left(\frac{2^x b}{\sqrt{ab}}\right)}{\sqrt{ab}\,\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+2^(2*x)*b),x, algorithm="maxima")
[Out] arctan(2^x*b/sqrt(a*b))/(sqrt(a*b)*log(2))
```

Fricas [A]
time = 0.40, size = 86, normalized size = 2.87

$$\left[-\frac{\sqrt{-ab}\,\log\left(\frac{2^{2x}b-2\sqrt{-ab}\,2^x-a}{2^{2x}b+a}\right)}{2\,ab\log(2)},\,-\frac{\sqrt{ab}\,\arctan\left(\frac{\sqrt{ab}}{2^x b}\right)}{ab\log(2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+2^(2*x)*b),x, algorithm="fricas")
```

```
[Out] [-1/2*sqrt(-a*b)*log((2^(2*x)*b - 2*sqrt(-a*b)*2^x - a)/(2^(2*x)*b + a))/(a
*b*log(2)), -sqrt(a*b)*arctan(sqrt(a*b)/(2^x*b))/(a*b*log(2))]
```

Sympy [A]
time = 0.07, size = 24, normalized size = 0.80

$$\frac{\operatorname{RootSum}\left(4z^2ab+1,\left(i\mapsto i\log\left(2^x+2ia\right)\right)\right)}{\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a+2**(2*x)*b),x)
```

```
[Out] RootSum(4*_z**2*a*b + 1, Lambda(_i, _i*log(2**x + 2*_i*a)))/log(2)
```

Giac [A]
time = 2.19, size = 21, normalized size = 0.70

$$\frac{\arctan\left(\frac{2^x b}{\sqrt{ab}}\right)}{\sqrt{ab}\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+2^(2*x)*b),x, algorithm="giac")
```

```
[Out] arctan(2^x*b/sqrt(a*b))/(sqrt(a*b)*log(2))
```

Mupad [B]
time = 3.58, size = 22, normalized size = 0.73

$$\frac{\operatorname{atan}\left(\frac{2^x\sqrt{b}}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\ln\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a + 2^(2*x)*b),x)
```

```
[Out] atan((2^x*b^(1/2))/a^(1/2))/(a^(1/2)*b^(1/2)*log(2))
```

3.483 $\int \frac{2^x}{a-4^x b} dx$

Optimal. Leaf size=30

$$\frac{\tanh^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(2)}$$

```
[Out] arctanh(2^x*b^(1/2)/a^(1/2))/ln(2)/a^(1/2)/b^(1/2)
```

Rubi [A]
time = 0.02, antiderivative size = 30, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {2281, 214}

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x/(a - 4^x*b),x]
```

```
[Out] ArcTanh[(2^x*Sqrt[b])/Sqrt[a]]/(Sqrt[a]*Sqrt[b]*Log[2])
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{2^x}{a-4^x b}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{a-bx^2}\,dx, x, 2^x\right)}{\log(2)}\\ &= \frac{\tanh^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(2)}\end{aligned}$$

Mathematica [A]
time = 0.04, size = 30, normalized size = 1.00

$$\frac{\tanh^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/(a - 4^x*b),x]
```

```
[Out] ArcTanh[(2^x*Sqrt[b])/Sqrt[a]]/(Sqrt[a]*Sqrt[b]*Log[2])
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 48 vs. $2(22) = 44$.
time = 0.02, size = 49, normalized size = 1.63

method	result	size
risch	$\frac{\ln\left(2^x+\frac{a}{\sqrt{ba}}\right)}{2\sqrt{ba}\,\ln(2)}-\frac{\ln\left(2^x-\frac{a}{\sqrt{ba}}\right)}{2\sqrt{ba}\,\ln(2)}$	49

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a-4^x*b),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/(b*a)^(1/2)/ln(2)*ln(2^x+1/(b*a)^(1/2)*a)-1/2/(b*a)^(1/2)/ln(2)*ln(2^x-
1/(b*a)^(1/2)*a)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 45 vs. $2(22) = 44$.
time = 0.48, size = 45, normalized size = 1.50

$$-\frac{\log\left(\frac{2^{x+1}b-2\sqrt{ab}}{2^{x+1}b+2\sqrt{ab}}\right)}{2\sqrt{ab}\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-4^x*b),x, algorithm="maxima")
```

```
[Out] -1/2*log((2^(x + 1)*b - 2*sqrt(a*b))/(2^(x + 1)*b + 2*sqrt(a*b)))/(sqrt(a*b
)*log(2))
```

Fricas [A]
time = 0.48, size = 86, normalized size = 2.87

$$\left[\frac{\sqrt{ab}\log\left(\frac{2^{2x}b+2\sqrt{ab}\,2^x+a}{2^{2x}b-a}\right)}{2\,ab\log(2)},-\frac{\sqrt{-ab}\arctan\left(\frac{\sqrt{-ab}}{2^xb}\right)}{ab\log(2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-4^x*b),x, algorithm="fricas")
```

```
[Out] [1/2*sqrt(a*b)*log((2^(2*x)*b + 2*sqrt(a*b)*2^x + a)/(2^(2*x)*b - a))/(a*b*
log(2)), -sqrt(-a*b)*arctan(sqrt(-a*b)/(2^x*b))/(a*b*log(2))]
```

Sympy [A]
time = 0.15, size = 29, normalized size = 0.97

$$\frac{\operatorname{RootSum}\left(4z^2ab-1,\left(i\mapsto i\log\left(2ia+e^{\frac{x\log(4)}{2}}\right)\right)\right)}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a-4**x*b),x)
```

```
[Out] RootSum(4*_z**2*a*b - 1, Lambda(_i, _i*log(2*_i*a + exp(x*log(4)/2))))/log(
2)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-4^x*b),x, algorithm="giac")
```

```
[Out] integrate(-2^x/(4^x*b - a), x)
```

Mupad [B]
time = 3.78, size = 22, normalized size = 0.73

$$\frac{\operatorname{atanh}\left(\frac{2^x\sqrt{b}}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a - 4^x*b),x)
```

```
[Out] atanh((2^x*b^(1/2))/a^(1/2))/(a^(1/2)*b^(1/2)*log(2))
```

3.484 $\int \frac{2^x}{a-2^{2x}b}\,dx$

Optimal. Leaf size=30

$$\frac{\tanh^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(2)}$$

```
[Out] arctanh(2^x*b^(1/2)/a^(1/2))/ln(2)/a^(1/2)/b^(1/2)
```

Rubi [A]

time = 0.02, antiderivative size = 30, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {2281, 214}

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x/(a - 2^(2*x)*b),x]
```

```
[Out] ArcTanh[(2^x*Sqrt[b])/Sqrt[a]]/(Sqrt[a]*Sqrt[b]*Log[2])
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{2^x}{a-2^{2x}b}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{a-bx^2}\,dx, x, 2^x\right)}{\log(2)}\\ &= \frac{\tanh^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(2)}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 30, normalized size = 1.00

$$\frac{\tanh^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/(a - 2^(2*x)*b),x]
[Out] ArcTanh[(2^x*Sqrt[b])/Sqrt[a]]/(Sqrt[a]*Sqrt[b]*Log[2])
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 48 vs. 2(22) = 44.
time = 0.02, size = 49, normalized size = 1.63

method	result	size
risch	$\frac{\ln\left(2^x+\frac{a}{\sqrt{ba}}\right)}{2\sqrt{ba}\,\ln(2)}-\frac{\ln\left(2^x-\frac{a}{\sqrt{ba}}\right)}{2\sqrt{ba}\,\ln(2)}$	49

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a-2^(2*x)*b),x,method=_RETURNVERBOSE)
[Out] 1/2/(b*a)^(1/2)/ln(2)*ln(2^x+1/(b*a)^(1/2)*a)-1/2/(b*a)^(1/2)/ln(2)*ln(2^x-
1/(b*a)^(1/2)*a)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 45 vs. 2(22) = 44.
time = 0.50, size = 45, normalized size = 1.50

$$-\frac{\log\left(\frac{2^{x+1}b-2\sqrt{ab}}{2^{x+1}b+2\sqrt{ab}}\right)}{2\sqrt{ab}\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-2^(2*x)*b),x, algorithm="maxima")
[Out] -1/2*log((2^(x + 1)*b - 2*sqrt(a*b))/(2^(x + 1)*b + 2*sqrt(a*b)))/(sqrt(a*b
)*log(2))
```

Fricas [A]
time = 0.46, size = 86, normalized size = 2.87

$$\left[\frac{\sqrt{ab}\log\left(\frac{2^{2x}b+2\sqrt{ab}\,2^x+a}{2^{2x}b-a}\right)}{2\,ab\log(2)},\,-\frac{\sqrt{-ab}\arctan\left(\frac{\sqrt{-ab}}{2^x b}\right)}{ab\log(2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-2^(2*x)*b),x, algorithm="fricas")
```

```
[Out] [1/2*sqrt(a*b)*log((2^(2*x)*b + 2*sqrt(a*b)*2^x + a)/(2^(2*x)*b - a))/(a*b*
log(2)), -sqrt(-a*b)*arctan(sqrt(-a*b)/(2^x*b))/(a*b*log(2))]
```

Sympy [A]
time = 0.08, size = 24, normalized size = 0.80

$$\frac{\operatorname{RootSum}\left(4z^2ab-1,\left(i\mapsto i\log\left(2^x+2ia\right)\right)\right)}{\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a-2**(2*x)*b),x)
```

```
[Out] RootSum(4*_z**2*a*b - 1, Lambda(_i, _i*log(2**x + 2*_i*a)))/log(2)
```

Giac [A]
time = 2.11, size = 24, normalized size = 0.80

$$-\frac{\arctan\left(\frac{2^x b}{\sqrt{-ab}}\right)}{\sqrt{-ab}\,\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-2^(2*x)*b),x, algorithm="giac")
```

```
[Out] -arctan(2^x*b/sqrt(-a*b))/(sqrt(-a*b)*log(2))
```

Mupad [B]
time = 3.59, size = 22, normalized size = 0.73

$$\frac{\operatorname{atanh}\left(\frac{2^x\sqrt{b}}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\ln\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a - 2^(2*x)*b),x)
```

```
[Out] atanh((2^x*b^(1/2))/a^(1/2))/(a^(1/2)*b^(1/2)*log(2))
```

3.485 $\int \frac{2^x}{a+4^{-x}b}\,dx$

Optimal. Leaf size=43

$$\frac{2^x}{a\log(2)}-\frac{\sqrt{b}\,\tan^{-1}\left(\frac{2^x\sqrt{a}}{\sqrt{b}}\right)}{a^{3/2}\log(2)}$$

[Out] 2^x/a/ln(2)-arctan(2^x*a^(1/2)/b^(1/2))*b^(1/2)/a^(3/2)/ln(2)

Rubi [A]
time = 0.03, antiderivative size = 43, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}=0.267$, Rules used = {2281, 199, 327, 211}

$$\frac{2^x}{a\log(2)}-\frac{\sqrt{b}\,\text{ArcTan}\left(\frac{\sqrt{a}\,2^x}{\sqrt{b}}\right)}{a^{3/2}\log(2)}$$

Antiderivative was successfully verified.

[In] Int[2^x/(a + b/4^x),x]

[Out] 2^x/(a*Log[2]) - (Sqrt[b]*ArcTan[(2^x*Sqrt[a])/Sqrt[b]])/(a^(3/2)*Log[2])

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(n*p)*(b + a/x^n)^p,
x] /; FreeQ[{a, b}, x] && LtQ[n, 0] && IntegerQ[p]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
```

```
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{2^x}{a+4^{-x}b}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{a+\frac{b}{x^2}}\,dx, x, 2^x\right)}{\log(2)}\\ &= \frac{\text{Subst}\left(\int \frac{x^2}{b+ax^2}\,dx, x, 2^x\right)}{\log(2)}\\ &= \frac{2^x}{a\log(2)} - \frac{b\text{Subst}\left(\int \frac{1}{b+ax^2}\,dx, x, 2^x\right)}{a\log(2)}\\ &= \frac{2^x}{a\log(2)} - \frac{\sqrt{b}\,\tan^{-1}\left(\frac{2^x\sqrt{a}}{\sqrt{b}}\right)}{a^{3/2}\log(2)}\end{aligned}$$

Mathematica [A]
time = 0.05, size = 40, normalized size = 0.93

$$\frac{\frac{2^x}{a} - \frac{\sqrt{b}\,\tan^{-1}\left(\frac{2^x\sqrt{a}}{\sqrt{b}}\right)}{a^{3/2}}}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/(a + b/4^x),x]
[Out] (2^x/a - (Sqrt[b]*ArcTan[(2^x*Sqrt[a])/Sqrt[b]])/a^(3/2))/Log[2]
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 73 vs. $2(35) = 70$.
time = 0.03, size = 74, normalized size = 1.72

method	result	size
risch	$\frac{2^x}{a\ln(2)} + \frac{\sqrt{-ba}\,\ln\left(2^x - \frac{\sqrt{-ba}}{a}\right)}{2a^2\ln(2)} - \frac{\sqrt{-ba}\,\ln\left(2^x + \frac{\sqrt{-ba}}{a}\right)}{2a^2\ln(2)}$	74

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a+b/(4^x)),x,method=_RETURNVERBOSE)
```

```
[Out] 2^x/a/ln(2)+1/2/a^2*(-b*a)^(1/2)/ln(2)*ln(2^x-1/a*(-b*a)^(1/2))-1/2/a^2*(-b
*a)^(1/2)/ln(2)*ln(2^x+1/a*(-b*a)^(1/2))
```

Maxima [A]
time = 0.49, size = 68, normalized size = 1.58

$$\frac{b\arctan\left(\frac{b}{\sqrt{ab}\,2^x}\right)}{\sqrt{ab}\,a\log(2)}+\frac{4^{\frac{1}{2}x}a+\frac{b}{4^{\frac{1}{2}x}}}{a^2\log(2)}-\frac{b}{2^xa^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+b/(4^x)),x, algorithm="maxima")
```

```
[Out] b*arctan(b/(sqrt(a*b)*2^x))/(sqrt(a*b)*a*log(2)) + (4^(1/2*x)*a + b/4^(1/2*
x))/(a^2*log(2)) - b/(2^x*a^2*log(2))
```

Fricas [A]
time = 0.45, size = 102, normalized size = 2.37

$$\left[\frac{\sqrt{-\frac{b}{a}}\log\left(-\frac{2\cdot 2^xa\sqrt{-\frac{b}{a}}-2^{2x}a+b}{2^{2x}a+b}\right)+2\cdot 2^x}{2a\log(2)},-\frac{\sqrt{\frac{b}{a}}\arctan\left(\frac{2^xa\sqrt{\frac{b}{a}}}{b}\right)-2^x}{a\log(2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+b/(4^x)),x, algorithm="fricas")
```

```
[Out] [1/2*(sqrt(-b/a)*log(-(2*2^x*a*sqrt(-b/a) - 2^(2*x)*a + b)/(2^(2*x)*a + b))
 + 2*2^x)/(a*log(2)), -(sqrt(b/a)*arctan(2^x*a*sqrt(b/a)/b) - 2^x)/(a*log(2
))]
```

Sympy [A]
time = 0.10, size = 39, normalized size = 0.91

$$\begin{cases}\frac{2^x}{a\log(2)} & \text{for}\ a\log(2)\neq 0\\ \frac{x}{a} & \text{otherwise}\end{cases}+\frac{\operatorname{RootSum}\left(4z^2a^3+b,\left(i\mapsto i\log\left(2^x-2ia\right)\right)\right)}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a+b/(4**x)),x)
```

[Out] Piecewise((2**x/(a*log(2)), Ne(a*log(2), 0)), (x/a, True)) + RootSum(4*_z**2*a**3 + b, Lambda(_i, _i*log(2**x - 2*_i*a)))/log(2)

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(2^x/(a+b/(4^x)),x, algorithm="giac")

[Out] integrate(2^x/(a + b/4^x), x)

Mupad [B]
time = 3.61, size = 35, normalized size = 0.81

$$\frac{2^x}{a\,\ln\left(2\right)}-\frac{\sqrt{b}\,\mathrm{atan}\left(\frac{2^x\,\sqrt{a}}{\sqrt{b}}\right)}{a^{3/2}\,\ln\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(2^x/(a + b/4^x),x)

[Out] 2^x/(a*log(2)) - (b^(1/2)*atan((2^x*a^(1/2))/b^(1/2)))/(a^(3/2)*log(2))

3.486 $\int \frac{2^x}{a+2^{-2x}b} \, dx$

Optimal. Leaf size=43

$$\frac{2^x}{a\log(2)} - \frac{\sqrt{b}\tan^{-1}\left(\frac{2^x\sqrt{a}}{\sqrt{b}}\right)}{a^{3/2}\log(2)}$$

```
[Out] 2^x/a/ln(2)-arctan(2^x*a^(1/2)/b^(1/2))*b^(1/2)/a^(3/2)/ln(2)
```

Rubi [A]
time = 0.03, antiderivative size = 43, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$, Rules used = {2281, 199, 327, 211}

$$\frac{2^x}{a\log(2)} - \frac{\sqrt{b}\,\text{ArcTan}\left(\frac{\sqrt{a}\,2^x}{\sqrt{b}}\right)}{a^{3/2}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x/(a + b/2^(2*x)),x]
```

```
[Out] 2^x/(a*Log[2]) - (Sqrt[b]*ArcTan[(2^x*Sqrt[a])/Sqrt[b]])/(a^(3/2)*Log[2])
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(n*p)*(b + a/x^n)^p,
x] /; FreeQ[{a, b}, x] && LtQ[n, 0] && IntegerQ[p]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
```

```
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{2^x}{a+2^{-2x}b}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{a+\frac{b}{x^2}}\,dx, x, 2^x\right)}{\log(2)}\\ &= \frac{\text{Subst}\left(\int \frac{x^2}{b+ax^2}\,dx, x, 2^x\right)}{\log(2)}\\ &= \frac{2^x}{a\log(2)} - \frac{b\text{Subst}\left(\int \frac{1}{b+ax^2}\,dx, x, 2^x\right)}{a\log(2)}\\ &= \frac{2^x}{a\log(2)} - \frac{\sqrt{b}\tan^{-1}\left(\frac{2^x\sqrt{a}}{\sqrt{b}}\right)}{a^{3/2}\log(2)}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 40, normalized size = 0.93

$$\frac{\frac{2^x}{a} - \frac{\sqrt{b}\tan^{-1}\left(\frac{2^x\sqrt{a}}{\sqrt{b}}\right)}{a^{3/2}}}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/(a + b/2^(2*x)),x]
[Out] (2^x/a - (Sqrt[b]*ArcTan[(2^x*Sqrt[a])/Sqrt[b]])/a^(3/2))/Log[2]
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 73 vs. 2(35) = 70.
time = 0.03, size = 74, normalized size = 1.72

method	result	size
risch	$\frac{2^x}{a\ln(2)} + \frac{\sqrt{-ba}\,\ln\left(2^x - \frac{\sqrt{-ba}}{a}\right)}{2a^2\ln(2)} - \frac{\sqrt{-ba}\,\ln\left(2^x + \frac{\sqrt{-ba}}{a}\right)}{2a^2\ln(2)}$	74

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a+b/(2^(2*x))),x,method=_RETURNVERBOSE)
```

```
[Out] 2^x/a/ln(2)+1/2/a^2*(-b*a)^(1/2)/ln(2)*ln(2^x-1/a*(-b*a)^(1/2))-1/2/a^2*(-b
*a)^(1/2)/ln(2)*ln(2^x+1/a*(-b*a)^(1/2))
```

Maxima [A]
time = 0.49, size = 39, normalized size = 0.91

$$\frac{b\arctan\left(\frac{b}{\sqrt{ab}\,2^x}\right)}{\sqrt{ab}\,a\log(2)}+\frac{2^x}{a\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+b/(2^(2*x))),x, algorithm="maxima")
```

```
[Out] b*arctan(b/(sqrt(a*b)*2^x))/(sqrt(a*b)*a*log(2)) + 2^x/(a*log(2))
```

Fricas [A]
time = 0.41, size = 102, normalized size = 2.37

$$\left[\frac{\sqrt{-\frac{b}{a}}\log\left(-\frac{2\cdot 2^x a\sqrt{-\frac{b}{a}}-2^{2x}a+b}{2^{2x}a+b}\right)+2\cdot 2^x}{2\,a\log(2)},\ -\frac{\sqrt{\frac{b}{a}}\arctan\left(\frac{2^x a\sqrt{\frac{b}{a}}}{b}\right)-2^x}{a\log(2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+b/(2^(2*x))),x, algorithm="fricas")
```

```
[Out] [1/2*(sqrt(-b/a)*log(-(2*2^x*a*sqrt(-b/a) - 2^(2*x)*a + b)/(2^(2*x)*a + b))
 + 2*2^x)/(a*log(2)), -(sqrt(b/a)*arctan(2^x*a*sqrt(b/a)/b) - 2^x)/(a*log(2
))]
```

Sympy [A]
time = 0.11, size = 44, normalized size = 1.02

$$\begin{cases}\frac{2^x}{a\log(2)} & \text{for}\ a\log(2)\neq 0\\ \frac{x}{a} & \text{otherwise}\end{cases}+\frac{\operatorname{RootSum}\left(4z^2a^3+b,\left(i\mapsto i\log\left(\frac{2ia^2}{b}+2^{-x}\right)\right)\right)}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a+b/(2**(2*x))),x)
```

```
[Out] Piecewise((2**x/(a*log(2)), Ne(a*log(2), 0)), (x/a, True)) + RootSum(4*_z**
2*a**3 + b, Lambda(_i, _i*log(2*_i*a**2/b + 2**(-x))))/log(2)
```

Giac [A]
time = 2.38, size = 38, normalized size = 0.88

$$-\frac{b\arctan\left(\frac{2^{x}a}{\sqrt{ab}}\right)}{\sqrt{ab}\,a\log\left(2\right)}+\frac{2^{x}}{a\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+b/(2^(2*x))),x, algorithm="giac")
```

```
[Out] -b*arctan(2^x*a/sqrt(a*b))/(sqrt(a*b)*a*log(2)) + 2^x/(a*log(2))
```

Mupad [B]
time = 3.54, size = 35, normalized size = 0.81

$$\frac{2^{x}}{a\,\ln\left(2\right)}-\frac{\sqrt{b}\,\mathrm{atan}\left(\frac{2^{x}\,\sqrt{a}}{\sqrt{b}}\right)}{a^{3/2}\,\ln\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a + b/2^(2*x)),x)
```

```
[Out] 2^x/(a*log(2)) - (b^(1/2)*atan((2^x*a^(1/2))/b^(1/2)))/(a^(3/2)*log(2))
```

3.487 $\int \frac{2^x}{a-4^{-x}b}\,dx$

Optimal. Leaf size=43

$$\frac{2^x}{a\log(2)}-\frac{\sqrt{b}\tanh^{-1}\left(\frac{2^x\sqrt{a}}{\sqrt{b}}\right)}{a^{3/2}\log(2)}$$

[Out] 2^x/a/ln(2)-arctanh(2^x*a^(1/2)/b^(1/2))*b^(1/2)/a^(3/2)/ln(2)

Rubi [A]
time = 0.03, antiderivative size = 43, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {2281, 199, 327, 214}

$$\frac{2^x}{a\log(2)}-\frac{\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{a}\,2^x}{\sqrt{b}}\right)}{a^{3/2}\log(2)}$$

Antiderivative was successfully verified.

[In] Int[2^x/(a - b/4^x),x]

[Out] 2^x/(a*Log[2]) - (Sqrt[b]*ArcTanh[(2^x*Sqrt[a])/Sqrt[b]])/(a^(3/2)*Log[2])

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(n*p)*(b + a/x^n)^p,
x] /; FreeQ[{a, b}, x] && LtQ[n, 0] && IntegerQ[p]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
```

```
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^x}{a-4^{-x}b}\,dx = \frac{\text{Subst}\left(\int \frac{1}{a-\frac{b}{x^2}}\,dx,x,2^x\right)}{\log(2)}$$
$$= \frac{\text{Subst}\left(\int \frac{x^2}{-b+ax^2}\,dx,x,2^x\right)}{\log(2)}$$
$$= \frac{2^x}{a\log(2)} + \frac{b\text{Subst}\left(\int \frac{1}{-b+ax^2}\,dx,x,2^x\right)}{a\log(2)}$$
$$= \frac{2^x}{a\log(2)} - \frac{\sqrt{b}\,\tanh^{-1}\left(\frac{2^x\sqrt{a}}{\sqrt{b}}\right)}{a^{3/2}\log(2)}$$

Mathematica [A]
time = 0.04, size = 40, normalized size = 0.93

$$\frac{\frac{2^x}{a} - \frac{\sqrt{b}\,\tanh^{-1}\left(\frac{2^x\sqrt{a}}{\sqrt{b}}\right)}{a^{3/2}}}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/(a - b/4^x),x]
[Out] (2^x/a - (Sqrt[b]*ArcTanh[(2^x*Sqrt[a])/Sqrt[b]])/a^(3/2))/Log[2]
```

Maple [A]
time = 0.03, size = 70, normalized size = 1.63

method	result	size
risch	$\frac{2^x}{a\ln(2)} + \frac{\sqrt{ba}\,\ln\left(2^x - \frac{\sqrt{ba}}{a}\right)}{2a^2\ln(2)} - \frac{\sqrt{ba}\,\ln\left(2^x + \frac{\sqrt{ba}}{a}\right)}{2a^2\ln(2)}$	70

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a-b/(4^x)),x,method=_RETURNVERBOSE)
[Out] 2^x/a/ln(2)+1/2/a^2*(b*a)^(1/2)/ln(2)*ln(2^x-1/a*(b*a)^(1/2))-1/2/a^2*(b*a)
^(1/2)/ln(2)*ln(2^x+1/a*(b*a)^(1/2))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 88 vs. $2(35) = 70$.
time = 0.50, size = 88, normalized size = 2.05

$$\frac{b\log\left(-\frac{\sqrt{ab}-\frac{b}{2^x}}{\sqrt{ab}+\frac{b}{2^x}}\right)}{2\sqrt{ab}\,a\log(2)}+\frac{4^{\frac{1}{2}x}a-\frac{b}{4^{\frac{1}{2}x}}}{a^2\log(2)}+\frac{b}{2^x a^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-b/(4^x)),x, algorithm="maxima")
```

```
[Out] 1/2*b*log(-(sqrt(a*b) - b/2^x)/(sqrt(a*b) + b/2^x))/(sqrt(a*b)*a*log(2)) +
(4^(1/2*x)*a - b/4^(1/2*x))/(a^2*log(2)) + b/(2^x*a^2*log(2))
```

Fricas [A]
time = 0.37, size = 103, normalized size = 2.40

$$\left[\frac{\sqrt{\frac{b}{a}}\log\left(-\frac{2\cdot 2^x a\sqrt{\frac{b}{a}}-2^{2x}a-b}{2^{2x}a-b}\right)+2\cdot 2^x}{2\,a\log(2)},\ \frac{\sqrt{-\frac{b}{a}}\arctan\left(\frac{2^x a\sqrt{-\frac{b}{a}}}{b}\right)+2^x}{a\log(2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-b/(4^x)),x, algorithm="fricas")
```

```
[Out] [1/2*(sqrt(b/a)*log(-(2*2^x*a*sqrt(b/a) - 2^(2*x)*a - b)/(2^(2*x)*a - b)) +
 2*2^x)/(a*log(2)), (sqrt(-b/a)*arctan(2^x*a*sqrt(-b/a)/b) + 2^x)/(a*log(2)
)]
```

Sympy [A]
time = 0.10, size = 39, normalized size = 0.91

$$\begin{cases}\frac{2^x}{a\log(2)} & \text{for}\ a\log(2)\neq 0\\ \frac{x}{a} & \text{otherwise}\end{cases}+\frac{\operatorname{RootSum}\left(4z^2a^3-b,\left(i\mapsto i\log\left(2^x-2ia\right)\right)\right)}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a-b/(4**x)),x)
```

```
[Out] Piecewise((2**x/(a*log(2)), Ne(a*log(2), 0)), (x/a, True)) + RootSum(4*_z**
2*a**3 - b, Lambda(_i, _i*log(2**x - 2*_i*a)))/log(2)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-b/(4^x)),x, algorithm="giac")
```

```
[Out] integrate(2^x/(a - b/4^x), x)
```

Mupad [B]
time = 3.68, size = 35, normalized size = 0.81

$$\frac{2^x}{a\ln(2)} - \frac{\sqrt{b}\,\operatorname{atanh}\left(\frac{2^x\,\sqrt{a}}{\sqrt{b}}\right)}{a^{3/2}\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a - b/4^x),x)
```

```
[Out] 2^x/(a*log(2)) - (b^(1/2)*atanh((2^x*a^(1/2))/b^(1/2)))/(a^(3/2)*log(2))
```

3.488 $\int \frac{2^x}{a-2^{-2x}b}\,dx$

Optimal. Leaf size=43

$$\frac{2^x}{a\log(2)}-\frac{\sqrt{b}\,\tanh^{-1}\left(\frac{2^x\sqrt{a}}{\sqrt{b}}\right)}{a^{3/2}\log(2)}$$

```
[Out] 2^x/a/ln(2)-arctanh(2^x*a^(1/2)/b^(1/2))*b^(1/2)/a^(3/2)/ln(2)
```

Rubi [A]
time = 0.03, antiderivative size = 43, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.250$, Rules used = {2281, 199, 327, 214}

$$\frac{2^x}{a\log(2)}-\frac{\sqrt{b}\,\tanh^{-1}\left(\frac{\sqrt{a}\,2^x}{\sqrt{b}}\right)}{a^{3/2}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x/(a - b/2^(2*x)),x]
```

```
[Out] 2^x/(a*Log[2]) - (Sqrt[b]*ArcTanh[(2^x*Sqrt[a])/Sqrt[b]])/(a^(3/2)*Log[2])
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(n*p)*(b + a/x^n)^p,
x] /; FreeQ[{a, b}, x] && LtQ[n, 0] && IntegerQ[p]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
```

```
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$
\begin{aligned}
\int \frac{2^x}{a-2^{-2x}b}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{a-\frac{b}{x^2}}\,dx, x, 2^x\right)}{\log(2)}\\
&= \frac{\text{Subst}\left(\int \frac{x^2}{-b+ax^2}\,dx, x, 2^x\right)}{\log(2)}\\
&= \frac{2^x}{a\log(2)} + \frac{b\text{Subst}\left(\int \frac{1}{-b+ax^2}\,dx, x, 2^x\right)}{a\log(2)}\\
&= \frac{2^x}{a\log(2)} - \frac{\sqrt{b}\tanh^{-1}\left(\frac{2^x\sqrt{a}}{\sqrt{b}}\right)}{a^{3/2}\log(2)}
\end{aligned}
$$

Mathematica [A]
time = 0.01, size = 40, normalized size = 0.93

$$
\frac{\frac{2^x}{a} - \frac{\sqrt{b}\tanh^{-1}\left(\frac{2^x\sqrt{a}}{\sqrt{b}}\right)}{a^{3/2}}}{\log(2)}
$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/(a - b/2^(2*x)),x]
[Out] (2^x/a - (Sqrt[b]*ArcTanh[(2^x*Sqrt[a])/Sqrt[b]])/a^(3/2))/Log[2]
```

Maple [A]
time = 0.02, size = 70, normalized size = 1.63

method	result	size
risch	$\frac{2^x}{a\ln(2)} + \frac{\sqrt{ba}\,\ln\left(2^x - \frac{\sqrt{ba}}{a}\right)}{2a^2\ln(2)} - \frac{\sqrt{ba}\,\ln\left(2^x + \frac{\sqrt{ba}}{a}\right)}{2a^2\ln(2)}$	70

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a-b/(2^(2*x))),x,method=_RETURNVERBOSE)
[Out] 2^x/a/ln(2)+1/2/a^2*(b*a)^(1/2)/ln(2)*ln(2^x-1/a*(b*a)^(1/2))-1/2/a^2*(b*a)
^(1/2)/ln(2)*ln(2^x+1/a*(b*a)^(1/2))
```

Maxima [A]
time = 0.49, size = 65, normalized size = 1.51

$$\frac{b\log\left(\frac{2^{-x+1}b-2\sqrt{ab}}{2^{-x+1}b+2\sqrt{ab}}\right)}{2\sqrt{ab}\,a\log(2)}+\frac{2^x}{a\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-b/(2^(2*x))),x, algorithm="maxima")
```

```
[Out] 1/2*b*log((2^(-x + 1)*b - 2*sqrt(a*b))/(2^(-x + 1)*b + 2*sqrt(a*b)))/(sqrt(
a*b)*a*log(2)) + 2^x/(a*log(2))
```

Fricas [A]
time = 0.37, size = 103, normalized size = 2.40

$$\left[\frac{\sqrt{\frac{b}{a}}\log\left(-\frac{2\cdot 2^x a\sqrt{\frac{b}{a}}-2^{2x}a-b}{2^{2x}a-b}\right)+2\cdot 2^x}{2\,a\log(2)},\ \frac{\sqrt{-\frac{b}{a}}\arctan\left(\frac{2^x a\sqrt{-\frac{b}{a}}}{b}\right)+2^x}{a\log(2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-b/(2^(2*x))),x, algorithm="fricas")
```

```
[Out] [1/2*(sqrt(b/a)*log(-(2*2^x*a*sqrt(b/a) - 2^(2*x)*a - b)/(2^(2*x)*a - b)) +
 2*2^x)/(a*log(2)), (sqrt(-b/a)*arctan(2^x*a*sqrt(-b/a)/b) + 2^x)/(a*log(2)
)]
```

Sympy [A]
time = 0.13, size = 44, normalized size = 1.02

$$\begin{cases}\frac{2^x}{a\log(2)} & \text{for}\ a\log(2)\neq 0\\ \frac{x}{a} & \text{otherwise}\end{cases}+\frac{\operatorname{RootSum}\left(4z^2a^3-b,\left(i\mapsto i\log\left(-\frac{2ia^2}{b}+2^{-x}\right)\right)\right)}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a-b/(2**(2*x))),x)
```

```
[Out] Piecewise((2**x/(a*log(2)), Ne(a*log(2), 0)), (x/a, True)) + RootSum(4*_z**
2*a**3 - b, Lambda(_i, _i*log(-2*_i*a**2/b + 2**(-x))))/log(2)
```

Giac [A]
time = 2.57, size = 39, normalized size = 0.91

$$\frac{b \arctan\left(\frac{2^x a}{\sqrt{-ab}}\right)}{\sqrt{-ab}\, a \log(2)} + \frac{2^x}{a \log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-b/(2^(2*x))),x, algorithm="giac")
```

```
[Out] b*arctan(2^x*a/sqrt(-a*b))/(sqrt(-a*b)*a*log(2)) + 2^x/(a*log(2))
```

Mupad [B]
time = 3.62, size = 35, normalized size = 0.81

$$\frac{2^x}{a\ \ln(2)} - \frac{\sqrt{b}\ \operatorname{atanh}\left(\frac{2^x\,\sqrt{a}}{\sqrt{b}}\right)}{a^{3/2}\ \ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a - b/2^(2*x)),x)
```

```
[Out] 2^x/(a*log(2)) - (b^(1/2)*atanh((2^x*a^(1/2))/b^(1/2)))/(a^(3/2)*log(2))
```

3.489 $\int \frac{2^x}{\sqrt{a+4^x b}}\,dx$

Optimal. Leaf size=31

$$\frac{\tanh^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a+4^x b}}\right)}{\sqrt{b}\log(2)}$$

```
[Out] arctanh(2^x*b^(1/2)/(a+4^x*b)^(1/2))/ln(2)/b^(1/2)
```

Rubi [A]
time = 0.03, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2281, 223, 212}

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a+b4^x}}\right)}{\sqrt{b}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x/Sqrt[a + 4^x*b],x]
```

```
[Out] ArcTanh[(2^x*Sqrt[b])/Sqrt[a + 4^x*b]]/(Sqrt[b]*Log[2])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 223

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^x}{\sqrt{a+4^x b}}\,dx = \frac{\text{Subst}\left(\int \frac{1}{\sqrt{a+bx^2}}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\text{Subst}\left(\int \frac{1}{1-bx^2}\,dx, x, \frac{2^x}{\sqrt{a+4^x b}}\right)}{\log(2)}$$
$$= \frac{\tanh^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a+4^x b}}\right)}{\sqrt{b}\log(2)}$$

Mathematica [A]
time = 0.06, size = 33, normalized size = 1.06

$$\frac{\tanh^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a+2^{2x}b}}\right)}{\sqrt{b}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/Sqrt[a + 4^x*b],x]
[Out] ArcTanh[(2^x*Sqrt[b])/Sqrt[a + 2^(2*x)*b]]/(Sqrt[b]*Log[2])
```

Maple [F]
time = 180.00, size = 0, normalized size = 0.00

$$\int \frac{2^x}{\sqrt{a+4^x b}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a+4^x*b)^(1/2),x)
[Out] int(2^x/(a+4^x*b)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+4^x*b)^(1/2),x, algorithm="maxima")
[Out] integrate(2^x/sqrt(4^x*b + a), x)
```

Fricas [A]
time = 0.39, size = 77, normalized size = 2.48

$$\left[\frac{\log\left(-2\sqrt{2^{2x}b+a}\,2^{x}\sqrt{b}-2\cdot 2^{2x}b-a\right)}{2\sqrt{b}\,\log(2)}, -\frac{\sqrt{-b}\,\arctan\left(\frac{2^{x}\sqrt{-b}}{\sqrt{2^{2x}b+a}}\right)}{b\log(2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+4^x*b)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/2*log(-2*sqrt(2^(2*x)*b + a)*2^x*sqrt(b) - 2*2^(2*x)*b - a)/(sqrt(b)*log
(2)), -sqrt(-b)*arctan(2^x*sqrt(-b)/sqrt(2^(2*x)*b + a))/(b*log(2))]
```

Sympy [A]
time = 0.38, size = 85, normalized size = 2.74

$$\frac{\begin{cases}\frac{\sqrt{-\frac{a}{b}}\operatorname{asin}\left(2^{x}\sqrt{-\frac{b}{a}}\right)}{\sqrt{a}} & \text{for}\ a>0\wedge b<0\\ \frac{\sqrt{\frac{a}{b}}\operatorname{asinh}\left(2^{x}\sqrt{\frac{b}{a}}\right)}{\sqrt{a}} & \text{for}\ a>0\wedge b>0\\ \frac{\sqrt{-\frac{a}{b}}\operatorname{acosh}\left(2^{x}\sqrt{-\frac{b}{a}}\right)}{\sqrt{-a}} & \text{for}\ b>0\wedge a<0\end{cases}}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a+4**x*b)**(1/2),x)
```

```
[Out] Piecewise((sqrt(-a/b)*asin(2**x*sqrt(-b/a))/sqrt(a), (a > 0) & (b < 0)), (s
qrt(a/b)*asinh(2**x*sqrt(b/a))/sqrt(a), (a > 0) & (b > 0)), (sqrt(-a/b)*aco
sh(2**x*sqrt(-b/a))/sqrt(-a), (b > 0) & (a < 0)))/log(2)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+4^x*b)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(2^x/sqrt(4^x*b + a), x)
```

Mupad [B]
time = 3.68, size = 28, normalized size = 0.90

$$\frac{\ln\left(\sqrt{a+2^{2\,x}\,b}+2^x\,\sqrt{b}\right)}{\sqrt{b}\,\ln\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a + 4^x*b)^(1/2),x)
```

```
[Out] log((a + 2^(2*x)*b)^(1/2) + 2^x*b^(1/2))/(b^(1/2)*log(2))
```

3.490 $\int \frac{2^x}{\sqrt{a+2^{2x}b}}\,dx$

Optimal. Leaf size=31

$$\frac{\tanh^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a+4^xb}}\right)}{\sqrt{b}\log(2)}$$

[Out] arctanh(2^x*b^(1/2)/(a+4^x*b)^(1/2))/ln(2)/b^(1/2)

Rubi [A]
time = 0.03, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.176$, Rules used = {2281, 223, 212}

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a+b4^x}}\right)}{\sqrt{b}\log(2)}$$

Antiderivative was successfully verified.

[In] Int[2^x/Sqrt[a + 2^(2*x)*b],x]

[Out] ArcTanh[(2^x*Sqrt[b])/Sqrt[a + 4^x*b]]/(Sqrt[b]*Log[2])

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 223

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^x}{\sqrt{a+2^{2x}b}}\,dx = \frac{\text{Subst}\left(\int \frac{1}{\sqrt{a+bx^2}}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\text{Subst}\left(\int \frac{1}{1-bx^2}\,dx, x, \frac{2^x}{\sqrt{a+4^x b}}\right)}{\log(2)}$$
$$= \frac{\tanh^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a+4^x b}}\right)}{\sqrt{b}\log(2)}$$

Mathematica [**A**]
time = 0.01, size = 33, normalized size = 1.06

$$\frac{\tanh^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a+2^{2x}b}}\right)}{\sqrt{b}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/Sqrt[a + 2^(2*x)*b],x]
[Out] ArcTanh[(2^x*Sqrt[b])/Sqrt[a + 2^(2*x)*b]]/(Sqrt[b]*Log[2])
```

Maple [**F**]
time = 180.00, size = 0, normalized size = 0.00

$$\int \frac{2^x}{\sqrt{a+2^{2x}b}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a+2^(2*x)*b)^(1/2),x)
[Out] int(2^x/(a+2^(2*x)*b)^(1/2),x)
```

Maxima [**A**]
time = 0.29, size = 22, normalized size = 0.71

$$\frac{\operatorname{arsinh}\left(\frac{2^{x+1}b}{2\sqrt{ab}}\right)}{\sqrt{b}\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+2^(2*x)*b)^(1/2),x, algorithm="maxima")
```

```
[Out] arcsinh(1/2*2^(x + 1)*b/sqrt(a*b))/(sqrt(b)*log(2))
```

Fricas [A]
time = 0.38, size = 77, normalized size = 2.48

$$\left[\frac{\log\left(-2\sqrt{2^{2x}b+a}\,2^{x}\sqrt{b}-2\cdot 2^{2x}b-a\right)}{2\sqrt{b}\log(2)},-\frac{\sqrt{-b}\arctan\left(\frac{2^{x}\sqrt{-b}}{\sqrt{2^{2x}b+a}}\right)}{b\log(2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+2^(2*x)*b)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/2*log(-2*sqrt(2^(2*x)*b + a)*2^x*sqrt(b) - 2*2^(2*x)*b - a)/(sqrt(b)*log
(2)), -sqrt(-b)*arctan(2^x*sqrt(-b)/sqrt(2^(2*x)*b + a))/(b*log(2))]
```

Sympy [A]
time = 0.40, size = 85, normalized size = 2.74

$$\frac{\begin{cases}\frac{\sqrt{-\frac{a}{b}}\operatorname{asin}\left(2^{x}\sqrt{-\frac{b}{a}}\right)}{\sqrt{a}} & \text{for}\ a>0\wedge b<0\\ \frac{\sqrt{\frac{a}{b}}\operatorname{asinh}\left(2^{x}\sqrt{\frac{b}{a}}\right)}{\sqrt{a}} & \text{for}\ a>0\wedge b>0\\ \frac{\sqrt{-\frac{a}{b}}\operatorname{acosh}\left(2^{x}\sqrt{-\frac{b}{a}}\right)}{\sqrt{-a}} & \text{for}\ b>0\wedge a<0\end{cases}}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a+2**(2*x)*b)**(1/2),x)
```

```
[Out] Piecewise((sqrt(-a/b)*asin(2**x*sqrt(-b/a))/sqrt(a), (a > 0) & (b < 0)), (s
qrt(a/b)*asinh(2**x*sqrt(b/a))/sqrt(a), (a > 0) & (b > 0)), (sqrt(-a/b)*aco
sh(2**x*sqrt(-b/a))/sqrt(-a), (b > 0) & (a < 0)))/log(2)
```

Giac [A]
time = 2.60, size = 31, normalized size = 1.00

$$-\frac{\log\left(\left|-2^{x}\sqrt{b}+\sqrt{2^{2x}b+a}\right|\right)}{\sqrt{b}\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+2^(2*x)*b)^(1/2),x, algorithm="giac")
```

```
[Out] -log(abs(-2^x*sqrt(b) + sqrt(2^(2*x)*b + a)))/(sqrt(b)*log(2))
```

Mupad [B]
time = 3.71, size = 28, normalized size = 0.90

$$\frac{\ln\left(\sqrt{a+2^{2\,x}\,b}\,+2^x\,\sqrt{b}\right)}{\sqrt{b}\,\ln\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a + 2^(2*x)*b)^(1/2),x)
```

```
[Out] log((a + 2^(2*x)*b)^(1/2) + 2^x*b^(1/2))/(b^(1/2)*log(2))
```

3.491 $\int \frac{2^x}{\sqrt{a-4^x b}} \, dx$

Optimal. Leaf size=32

$$\frac{\tan^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a-4^x b}}\right)}{\sqrt{b}\log(2)}$$

[Out] arctan(2^x*b^(1/2)/(a-4^x*b)^(1/2))/ln(2)/b^(1/2)

Rubi [A]
time = 0.03, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.188$, Rules used = {2281, 223, 209}

$$\frac{\text{ArcTan}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a-b4^x}}\right)}{\sqrt{b}\log(2)}$$

Antiderivative was successfully verified.

[In] Int[2^x/Sqrt[a - 4^x*b],x]

[Out] ArcTan[(2^x*Sqrt[b])/Sqrt[a - 4^x*b]]/(Sqrt[b]*Log[2])

Rule 209

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[b, 2]))*A
rcTan[Rt[b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 223

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^x}{\sqrt{a-4^x b}}\,dx = \frac{\text{Subst}\left(\int \frac{1}{\sqrt{a-bx^2}}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\text{Subst}\left(\int \frac{1}{1+bx^2}\,dx, x, \frac{2^x}{\sqrt{a-4^x b}}\right)}{\log(2)}$$
$$= \frac{\tan^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a-4^x b}}\right)}{\sqrt{b}\log(2)}$$

Mathematica [A]
time = 0.08, size = 34, normalized size = 1.06

$$\frac{\tan^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a-2^{2x}b}}\right)}{\sqrt{b}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/Sqrt[a - 4^x*b],x]
[Out] ArcTan[(2^x*Sqrt[b])/Sqrt[a - 2^(2*x)*b]]/(Sqrt[b]*Log[2])
```

Maple [F]
time = 180.00, size = 0, normalized size = 0.00

$$\int \frac{2^x}{\sqrt{a-4^x b}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a-4^x*b)^(1/2),x)
[Out] int(2^x/(a-4^x*b)^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-4^x*b)^(1/2),x, algorithm="maxima")
[Out] integrate(2^x/sqrt(-4^x*b + a), x)
```

Fricas [A]
time = 0.36, size = 92, normalized size = 2.88

$$\left[-\frac{\sqrt{-b}\log\left(-2\sqrt{-2^{2x}b+a}\,2^{x}\sqrt{-b}+2\cdot 2^{2x}b-a\right)}{2\,b\log\left(2\right)},-\frac{\arctan\left(\frac{\sqrt{-2^{2x}b+a}\,2^{x}\sqrt{b}}{2^{2x}b-a}\right)}{\sqrt{b}\log\left(2\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-4^x*b)^(1/2),x, algorithm="fricas")
```

```
[Out] [-1/2*sqrt(-b)*log(-2*sqrt(-2^(2*x)*b + a)*2^x*sqrt(-b) + 2*2^(2*x)*b - a)/
(b*log(2)), -arctan(sqrt(-2^(2*x)*b + a)*2^x*sqrt(b)/(2^(2*x)*b - a))/(sqrt
(b)*log(2))]
```

Sympy [A]
time = 0.40, size = 82, normalized size = 2.56

$$\frac{\begin{cases}\frac{\sqrt{\frac{a}{b}}\operatorname{asin}\left(2^{x}\sqrt{\frac{b}{a}}\right)}{\sqrt{a}} & \text{for}\ a>0\wedge b>0\\ \frac{\sqrt{-\frac{a}{b}}\operatorname{asinh}\left(2^{x}\sqrt{-\frac{b}{a}}\right)}{\sqrt{a}} & \text{for}\ a>0\wedge b<0\\ \frac{\sqrt{\frac{a}{b}}\operatorname{acosh}\left(2^{x}\sqrt{\frac{b}{a}}\right)}{\sqrt{-a}} & \text{for}\ a<0\wedge b<0\end{cases}}{\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a-4**x*b)**(1/2),x)
```

```
[Out] Piecewise((sqrt(a/b)*asin(2**x*sqrt(b/a))/sqrt(a), (a > 0) & (b > 0)), (sqr
t(-a/b)*asinh(2**x*sqrt(-b/a))/sqrt(a), (a > 0) & (b < 0)), (sqrt(a/b)*acos
h(2**x*sqrt(b/a))/sqrt(-a), (a < 0) & (b < 0)))/log(2)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-4^x*b)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(2^x/sqrt(-4^x*b + a), x)
```

Mupad [B]
time = 3.77, size = 33, normalized size = 1.03

$$\frac{\ln\left(\sqrt{a-2^{2\,x}\,b}+2^x\,\sqrt{-b}\right)}{\sqrt{-b}\,\ln\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a - 4^x*b)^(1/2),x)
[Out] log((a - 2^(2*x)*b)^(1/2) + 2^x*(-b)^(1/2))/((-b)^(1/2)*log(2))
```

3.492 $\int \frac{2^x}{\sqrt{a-2^{2x}b}}\,dx$

Optimal. Leaf size=32

$$\frac{\tan^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a-4^xb}}\right)}{\sqrt{b}\,\log(2)}$$

```
[Out] arctan(2^x*b^(1/2)/(a-4^x*b)^(1/2))/ln(2)/b^(1/2)
```

Rubi [A]
time = 0.03, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {2281, 223, 209}

$$\frac{\text{ArcTan}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a-b4^x}}\right)}{\sqrt{b}\,\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x/Sqrt[a - 2^(2*x)*b],x]
```

```
[Out] ArcTan[(2^x*Sqrt[b])/Sqrt[a - 4^x*b]]/(Sqrt[b]*Log[2])
```

Rule 209

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[b, 2]))*A
rcTan[Rt[b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 223

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^x}{\sqrt{a-2^{2x}b}}\,dx = \frac{\operatorname{Subst}\left(\int \frac{1}{\sqrt{a-bx^2}}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\operatorname{Subst}\left(\int \frac{1}{1+bx^2}\,dx, x, \frac{2^x}{\sqrt{a-4^x b}}\right)}{\log(2)}$$
$$= \frac{\tan^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a-4^x b}}\right)}{\sqrt{b}\log(2)}$$

<u>**Mathematica**</u> [**A**]
time = 0.01, size = 34, normalized size = 1.06

$$\frac{\tan^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a-2^{2x}b}}\right)}{\sqrt{b}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/Sqrt[a - 2^(2*x)*b],x]
[Out] ArcTan[(2^x*Sqrt[b])/Sqrt[a - 2^(2*x)*b]]/(Sqrt[b]*Log[2])
```

<u>**Maple**</u> [**F**]
time = 180.00, size = 0, normalized size = 0.00

$$\int \frac{2^x}{\sqrt{a-2^{2x}b}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a-2^(2*x)*b)^(1/2),x)
[Out] int(2^x/(a-2^(2*x)*b)^(1/2),x)
```

<u>**Maxima**</u> [**A**]
time = 0.48, size = 22, normalized size = 0.69

$$\frac{\arcsin\left(\frac{2^{x+1}b}{2\sqrt{ab}}\right)}{\sqrt{b}\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-2^(2*x)*b)^(1/2),x, algorithm="maxima")
```

```
[Out] arcsin(1/2*2^(x + 1)*b/sqrt(a*b))/(sqrt(b)*log(2))
```

Fricas [A]
time = 0.38, size = 92, normalized size = 2.88

$$\left[-\frac{\sqrt{-b}\log\left(-2\sqrt{-2^{2x}b+a}\,2^{x}\sqrt{-b}+2\cdot 2^{2x}b-a\right)}{2\,b\log\left(2\right)},-\frac{\arctan\left(\frac{\sqrt{-2^{2x}b+a}\,2^{x}\sqrt{b}}{2^{2x}b-a}\right)}{\sqrt{b}\log\left(2\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-2^(2*x)*b)^(1/2),x, algorithm="fricas")
```

```
[Out] [-1/2*sqrt(-b)*log(-2*sqrt(-2^(2*x)*b + a)*2^x*sqrt(-b) + 2*2^(2*x)*b - a)/
(b*log(2)), -arctan(sqrt(-2^(2*x)*b + a)*2^x*sqrt(b)/(2^(2*x)*b - a))/(sqrt
(b)*log(2))]
```

Sympy [A]
time = 0.41, size = 82, normalized size = 2.56

$$\frac{\begin{cases}\frac{\sqrt{\frac{a}{b}}\operatorname{asin}\left(2^{x}\sqrt{\frac{b}{a}}\right)}{\sqrt{a}} & \text{for}\ a>0\wedge b>0\\ \frac{\sqrt{-\frac{a}{b}}\operatorname{asinh}\left(2^{x}\sqrt{-\frac{b}{a}}\right)}{\sqrt{a}} & \text{for}\ a>0\wedge b<0\\ \frac{\sqrt{\frac{a}{b}}\operatorname{acosh}\left(2^{x}\sqrt{\frac{b}{a}}\right)}{\sqrt{-a}} & \text{for}\ a<0\wedge b<0\end{cases}}{\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a-2**(2*x)*b)**(1/2),x)
```

```
[Out] Piecewise((sqrt(a/b)*asin(2**x*sqrt(b/a))/sqrt(a), (a > 0) & (b > 0)), (sqr
t(-a/b)*asinh(2**x*sqrt(-b/a))/sqrt(a), (a > 0) & (b < 0)), (sqrt(a/b)*acos
h(2**x*sqrt(b/a))/sqrt(-a), (a < 0) & (b < 0)))/log(2)
```

Giac [A]
time = 2.91, size = 36, normalized size = 1.12

$$-\frac{\log\left(\left|-2^{x}\sqrt{-b}+\sqrt{-2^{2x}b+a}\right|\right)}{\sqrt{-b}\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-2^(2*x)*b)^(1/2),x, algorithm="giac")
```

```
[Out] -log(abs(-2^x*sqrt(-b) + sqrt(-2^(2*x)*b + a)))/(sqrt(-b)*log(2))
```

Mupad [B]
time = 3.63, size = 33, normalized size = 1.03

$$\frac{\ln\left(\sqrt{a-2^{2\,x}\,b}+2^x\,\sqrt{-b}\right)}{\sqrt{-b}\,\ln\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a - 2^(2*x)*b)^(1/2),x)
```

```
[Out] log((a - 2^(2*x)*b)^(1/2) + 2^x*(-b)^(1/2))/((-b)^(1/2)*log(2))
```

3.493 $\int \frac{2^x}{\sqrt{a+4^{-x}b}}\,dx$

Optimal. Leaf size=24

$$\frac{2^x\sqrt{a+2^{-2x}b}}{a\log(2)}$$

[Out] 2^x*(a+b/(2^(2*x)))^(1/2)/a/ln(2)

Rubi [A]

time = 0.03, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$, Rules used = {2281, 197}

$$\frac{2^x\sqrt{a+b2^{-2x}}}{a\log(2)}$$

Antiderivative was successfully verified.

[In] Int[2^x/Sqrt[a + b/4^x],x]

[Out] (2^x*Sqrt[a + b/2^(2*x)])/(a*Log[2])

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{2^x}{\sqrt{a+4^{-x}b}}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{\sqrt{a+\frac{b}{x^2}}}\,dx, x, 2^x\right)}{\log(2)}\\ &= \frac{2^x\sqrt{a+2^{-2x}b}}{a\log(2)}\end{aligned}$$

Mathematica [A]
time = 0.05, size = 35, normalized size = 1.46

$$\frac{2^{-x}(2^{2x}a+b)}{a\sqrt{a+2^{-2x}b}\,\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/Sqrt[a + b/4^x],x]
[Out] (2^(2*x)*a + b)/(2^x*a*Sqrt[a + b/2^(2*x)]*Log[2])
```

Maple [A]
time = 0.02, size = 40, normalized size = 1.67

method	result	size
risch	$\frac{(a2^{2x}+b)2^{-x}}{\sqrt{(a2^{2x}+b)\,2^{-2x}}\;a\ln(2)}$	40

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a+b/(4^x))^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/((a*(2^x)^2+b)/(2^x)^2)^(1/2)*(a*(2^x)^2+b)/(2^x)/a/ln(2)
```

Maxima [A]
time = 0.52, size = 19, normalized size = 0.79

$$\frac{\sqrt{2^{2x}a+b}}{a\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+b/(4^x))^(1/2),x, algorithm="maxima")
[Out] sqrt(2^(2*x)*a + b)/(a*log(2))
```

Fricas [A]
time = 0.35, size = 30, normalized size = 1.25

$$\frac{2^x\sqrt{\frac{2^{2x}a+b}{2^{2x}}}}{a\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+b/(4^x))^(1/2),x, algorithm="fricas")
[Out] 2^x*sqrt((2^(2*x)*a + b)/2^(2*x))/(a*log(2))
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2^x}{\sqrt{a + 4^{-x}b}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a+b/(4**x))**(1/2),x)
```

```
[Out] Integral(2**x/sqrt(a + b/4**x), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+b/(4^x))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(2^x/sqrt(a + b/4^x), x)
```

Mupad [B]
time = 3.51, size = 24, normalized size = 1.00

$$\frac{2^x\,\sqrt{a+\frac{b}{2^{2\,x}}}}{a\,\ln\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a + b/4^x)^(1/2),x)
```

```
[Out] (2^x*(a + b/2^(2*x))^(1/2))/(a*log(2))
```

3.494 $\int \frac{2^x}{\sqrt{a+2^{-2x}b}}\,dx$

Optimal. Leaf size=24

$$\frac{2^x\sqrt{a+2^{-2x}b}}{a\log(2)}$$

```
[Out] 2^x*(a+b/(2^(2*x)))^(1/2)/a/ln(2)
```

Rubi [A]
time = 0.03, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$, Rules used = {2281, 197}

$$\frac{2^x\sqrt{a+b2^{-2x}}}{a\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x/Sqrt[a + b/2^(2*x)],x]
```

```
[Out] (2^x*Sqrt[a + b/2^(2*x)])/(a*Log[2])
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{2^x}{\sqrt{a+2^{-2x}b}}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{\sqrt{a+\frac{b}{x^2}}}\,dx, x, 2^x\right)}{\log(2)}\\ &= \frac{2^x\sqrt{a+2^{-2x}b}}{a\log(2)}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 35, normalized size = 1.46

$$\frac{2^{-x}(2^{2x}a+b)}{a\sqrt{a+2^{-2x}b}\,\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/Sqrt[a + b/2^(2*x)],x]
[Out] (2^(2*x)*a + b)/(2^x*a*Sqrt[a + b/2^(2*x)]*Log[2])
```

Maple [A]
time = 0.01, size = 40, normalized size = 1.67

method	result	size
risch	$\frac{(a2^{2x}+b)2^{-x}}{\sqrt{(a2^{2x}+b)\,2^{-2x}}\;a\ln(2)}$	40

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a+b/(2^(2*x)))^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/((a*(2^x)^2+b)/(2^x)^2)^(1/2)*(a*(2^x)^2+b)/(2^x)/a/ln(2)
```

Maxima [A]
time = 0.29, size = 24, normalized size = 1.00

$$\frac{2^x\sqrt{a+\frac{b}{2^{2\,x}}}}{a\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+b/(2^(2*x)))^(1/2),x, algorithm="maxima")
[Out] 2^x*sqrt(a + b/2^(2*x))/(a*log(2))
```

Fricas [A]
time = 0.42, size = 30, normalized size = 1.25

$$\frac{2^x\sqrt{\frac{2^{2\,x}a+b}{2^{2\,x}}}}{a\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+b/(2^(2*x)))^(1/2),x, algorithm="fricas")
```

```
[Out] 2^x*sqrt((2^(2*x)*a + b)/2^(2*x))/(a*log(2))
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2^x}{\sqrt{a+2^{-2x}b}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a+b/(2**(2*x)))**(1/2),x)
[Out] Integral(2**x/sqrt(a + b/2**(2*x)), x)
```

Giac [A]
time = 2.84, size = 29, normalized size = 1.21

$$\frac{\frac{\sqrt{2^{2x}a+b}}{a}-\frac{\sqrt{b}}{a}}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+b/(2^(2*x)))^(1/2),x, algorithm="giac")
[Out] (sqrt(2^(2*x)*a + b)/a - sqrt(b)/a)/log(2)
```

Mupad [B]
time = 3.55, size = 24, normalized size = 1.00

$$\frac{2^x\sqrt{a+\frac{b}{2^{2x}}}}{a\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a + b/2^(2*x))^(1/2),x)
[Out] (2^x*(a + b/2^(2*x))^(1/2))/(a*log(2))
```

3.495 $\int \frac{2^x}{\sqrt{a-4^{-x}b}}\,dx$

Optimal. Leaf size=25

$$\frac{2^x\sqrt{a-2^{-2x}b}}{a\log(2)}$$

[Out] 2^x*(a-b/(2^(2*x)))^(1/2)/a/ln(2)

Rubi [A]
time = 0.04, antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2281, 197}

$$\frac{2^x\sqrt{a-b2^{-2x}}}{a\log(2)}$$

Antiderivative was successfully verified.

[In] Int[2^x/Sqrt[a - b/4^x],x]

[Out] (2^x*Sqrt[a - b/2^(2*x)])/(a*Log[2])

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{2^x}{\sqrt{a-4^{-x}b}}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{\sqrt{a-\frac{b}{x^2}}}\,dx,x,2^x\right)}{\log(2)}\\ &= \frac{2^x\sqrt{a-2^{-2x}b}}{a\log(2)}\end{aligned}$$

Mathematica [A]
time = 0.05, size = 38, normalized size = 1.52

$$\frac{2^{-x}(2^{2x}a-b)}{a\sqrt{a-2^{-2x}b}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/Sqrt[a - b/4^x],x]
[Out] (2^(2*x)*a - b)/(2^x*a*Sqrt[a - b/2^(2*x)]*Log[2])
```

Maple [A]
time = 0.02, size = 44, normalized size = 1.76

method	result	size
risch	$\frac{(a2^{2x}-b)2^{-x}}{\sqrt{(a2^{2x}-b)2^{-2x}}\,a\ln(2)}$	44

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a-b/(4^x))^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/((a*(2^x)^2-b)/(2^x)^2)^(1/2)*(a*(2^x)^2-b)/(2^x)/a/ln(2)
```

Maxima [A]
time = 0.52, size = 21, normalized size = 0.84

$$\frac{\sqrt{2^{2x}a-b}}{a\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-b/(4^x))^(1/2),x, algorithm="maxima")
[Out] sqrt(2^(2*x)*a - b)/(a*log(2))
```

Fricas [A]
time = 0.44, size = 32, normalized size = 1.28

$$\frac{2^x\sqrt{\frac{2^{2x}a-b}{2^{2x}}}}{a\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-b/(4^x))^(1/2),x, algorithm="fricas")
[Out] 2^x*sqrt((2^(2*x)*a - b)/2^(2*x))/(a*log(2))
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2^x}{\sqrt{a - 4^{-x}b}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a-b/(4**x))**(1/2),x)
```

```
[Out] Integral(2**x/sqrt(a - b/4**x), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-b/(4^x))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(2^x/sqrt(a - b/4^x), x)
```

Mupad [B]
time = 3.56, size = 25, normalized size = 1.00

$$\frac{2^x\,\sqrt{a-\frac{b}{2^{2\,x}}}}{a\,\ln\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a - b/4^x)^(1/2),x)
```

```
[Out] (2^x*(a - b/2^(2*x))^(1/2))/(a*log(2))
```

3.496 $\int \frac{2^x}{\sqrt{a-2^{-2x}b}}\,dx$

Optimal. Leaf size=25

$$\frac{2^x\sqrt{a-2^{-2x}b}}{a\log(2)}$$

```
[Out] 2^x*(a-b/(2^(2*x)))^(1/2)/a/ln(2)
```

Rubi [A]
time = 0.04, antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2281, 197}

$$\frac{2^x\sqrt{a-b2^{-2x}}}{a\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x/Sqrt[a - b/2^(2*x)],x]
```

```
[Out] (2^x*Sqrt[a - b/2^(2*x)])/(a*Log[2])
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{2^x}{\sqrt{a-2^{-2x}b}}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{\sqrt{a-\frac{b}{x^2}}}\,dx, x, 2^x\right)}{\log(2)}\\ &= \frac{2^x\sqrt{a-2^{-2x}b}}{a\log(2)}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 38, normalized size = 1.52

$$\frac{2^{-x}(2^{2x}a-b)}{a\sqrt{a-2^{-2x}b}\,\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/Sqrt[a - b/2^(2*x)],x]
```

```
[Out] (2^(2*x)*a - b)/(2^x*a*Sqrt[a - b/2^(2*x)]*Log[2])
```

Maple [A]
time = 0.01, size = 44, normalized size = 1.76

method	result	size
risch	$\frac{(a2^{2x}-b)2^{-x}}{\sqrt{(a2^{2x}-b)\,2^{-2x}}\;a\ln(2)}$	44

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a-b/(2^(2*x)))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/((a*(2^x)^2-b)/(2^x)^2)^(1/2)*(a*(2^x)^2-b)/(2^x)/a/ln(2)
```

Maxima [A]
time = 0.29, size = 25, normalized size = 1.00

$$\frac{2^{x}\sqrt{a-\frac{b}{2^{2\,x}}}}{a\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-b/(2^(2*x)))^(1/2),x, algorithm="maxima")
```

```
[Out] 2^x*sqrt(a - b/2^(2*x))/(a*log(2))
```

Fricas [A]
time = 0.45, size = 32, normalized size = 1.28

$$\frac{2^{x}\sqrt{\frac{2^{2\,x}a-b}{2^{2\,x}}}}{a\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-b/(2^(2*x)))^(1/2),x, algorithm="fricas")
```

```
[Out] 2^x*sqrt((2^(2*x)*a - b)/2^(2*x))/(a*log(2))
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2^x}{\sqrt{a - 2^{-2x}b}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a-b/(2**(2*x)))**(1/2),x)
[Out] Integral(2**x/sqrt(a - b/2**(2*x)), x)
```

Giac [**A**]
time = 1.36, size = 33, normalized size = 1.32

$$\frac{\frac{\sqrt{2^{2x}a - b}}{a} - \frac{\sqrt{-b}}{a}}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-b/(2^(2*x)))^(1/2),x, algorithm="giac")
[Out] (sqrt(2^(2*x)*a - b)/a - sqrt(-b)/a)/log(2)
```

Mupad [**B**]
time = 3.51, size = 25, normalized size = 1.00

$$\frac{2^x\sqrt{a - \frac{b}{2^{2x}}}}{a\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a - b/2^(2*x))^(1/2),x)
[Out] (2^x*(a - b/2^(2*x))^(1/2))/(a*log(2))
```

3.497 $\int \frac{4^x}{\sqrt{a+2^x b}}\,dx$

Optimal. Leaf size=44

$$-\frac{2a\sqrt{a+2^x b}}{b^2\log(2)}+\frac{2(a+2^x b)^{3/2}}{3b^2\log(2)}$$

[Out] 2/3*(a+2^x*b)^(3/2)/b^2/ln(2)-2*a*(a+2^x*b)^(1/2)/b^2/ln(2)

Rubi [A]
time = 0.03, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2280, 45}

$$\frac{2(a+b2^x)^{3/2}}{3b^2\log(2)}-\frac{2a\sqrt{a+b2^x}}{b^2\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[4^x/Sqrt[a + 2^x*b],x]
```

```
[Out] (-2*a*Sqrt[a + 2^x*b])/(b^2*Log[2]) + (2*(a + 2^x*b)^(3/2))/(3*b^2*Log[2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{4^x}{\sqrt{a+2^xb}}\,dx = \frac{\text{Subst}\left(\int \frac{x}{\sqrt{a+bx}}\,dx,x,2^x\right)}{\log(2)}$$
$$= \frac{\text{Subst}\left(\int \left(-\frac{a}{b\sqrt{a+bx}}+\frac{\sqrt{a+bx}}{b}\right)dx,x,2^x\right)}{\log(2)}$$
$$= -\frac{2a\sqrt{a+2^xb}}{b^2\log(2)}+\frac{2(a+2^xb)^{3/2}}{3b^2\log(2)}$$

Mathematica [A]
time = 0.06, size = 29, normalized size = 0.66

$$\frac{2(-2a+2^xb)\sqrt{a+2^xb}}{b^2\log(8)}$$

Antiderivative was successfully verified.

```
[In] Integrate[4^x/Sqrt[a + 2^x*b],x]
```

```
[Out] (2*(-2*a + 2^x*b)*Sqrt[a + 2^x*b])/(b^2*Log[8])
```

Maple [A]
time = 0.02, size = 29, normalized size = 0.66

method	result	size
risch	$-\frac{2(-2^xb+2a)\sqrt{a+2^xb}}{3b^2\ln(2)}$	29
meijerg	`error in int/gbinthm/express: unable to compute coeff\`	N/A

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a+2^x*b)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3*(-2^x*b+2*a)*(a+2^x*b)^(1/2)/b^2/ln(2)
```

Maxima [A]
time = 0.48, size = 68, normalized size = 1.55

$$\frac{2^{2x+1}}{3\sqrt{2^xb+a}\,\log(2)}-\frac{2^{x+1}a}{3\sqrt{2^xb+a}\,b\log(2)}-\frac{4a^2}{3\sqrt{2^xb+a}\,b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a+2^x*b)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/3*2^(2*x + 1)/(sqrt(2^x*b + a)*log(2)) - 1/3*2^(x + 1)*a/(sqrt(2^x*b + a)
*b*log(2)) - 4/3*a^2/(sqrt(2^x*b + a)*b^2*log(2))
```

Fricas [A]
time = 0.37, size = 27, normalized size = 0.61

$$\frac{2\sqrt{2^xb+a}\,(2^xb-2a)}{3b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a+2^x*b)^(1/2),x, algorithm="fricas")
```

```
[Out] 2/3*sqrt(2^x*b + a)*(2^x*b - 2*a)/(b^2*log(2))
```

Sympy [A]
time = 0.36, size = 56, normalized size = 1.27

$$\begin{cases} \frac{2\cdot 2^x\sqrt{2^xb+a}}{3b\log(2)} - \frac{4a\sqrt{2^xb+a}}{3b^2\log(2)} & \text{for}\ b\neq 0 \\ \frac{4^x}{2\sqrt{a}\,\log(2)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4**x/(a+2**x*b)**(1/2),x)
```

```
[Out] Piecewise((2*2**x*sqrt(2**x*b + a)/(3*b*log(2)) - 4*a*sqrt(2**x*b + a)/(3*b
**2*log(2)), Ne(b, 0)), (4**x/(2*sqrt(a)*log(2)), True))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a+2^x*b)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(4^x/sqrt(2^x*b + a), x)
```

Mupad [B]
time = 3.68, size = 28, normalized size = 0.64

$$-\frac{2\sqrt{a+2^x\,b}\,(2a-2^x\,b)}{3b^2\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a + 2^x*b)^(1/2),x)
```

```
[Out] -(2*(a + 2^x*b)^(1/2)*(2*a - 2^x*b))/(3*b^2*log(2))
```

3.498 $\int \frac{2^{2x}}{\sqrt{a+2^x b}}\,dx$

Optimal. Leaf size=44

$$-\frac{2a\sqrt{a+2^x b}}{b^2\log(2)}+\frac{2(a+2^x b)^{3/2}}{3b^2\log(2)}$$

```
[Out] 2/3*(a+2^x*b)^(3/2)/b^2/ln(2)-2*a*(a+2^x*b)^(1/2)/b^2/ln(2)
```

Rubi [A]
time = 0.03, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}=0.118$, Rules used = {2280, 45}

$$\frac{2(a+b2^x)^{3/2}}{3b^2\log(2)}-\frac{2a\sqrt{a+b2^x}}{b^2\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^(2*x)/Sqrt[a + 2^x*b],x]
```

```
[Out] (-2*a*Sqrt[a + 2^x*b])/(b^2*Log[2]) + (2*(a + 2^x*b)^(3/2))/(3*b^2*Log[2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^{2x}}{\sqrt{a+2^xb}}\,dx = \frac{\text{Subst}\left(\int \frac{x}{\sqrt{a+bx}}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\text{Subst}\left(\int \left(-\frac{a}{b\sqrt{a+bx}} + \frac{\sqrt{a+bx}}{b}\right)\,dx, x, 2^x\right)}{\log(2)}$$
$$= -\frac{2a\sqrt{a+2^xb}}{b^2\log(2)} + \frac{2(a+2^xb)^{3/2}}{3b^2\log(2)}$$

Mathematica [A]
time = 0.01, size = 29, normalized size = 0.66

$$\frac{2(-2a+2^xb)\sqrt{a+2^xb}}{b^2\log(8)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^(2*x)/Sqrt[a + 2^x*b],x]
[Out] (2*(-2*a + 2^x*b)*Sqrt[a + 2^x*b])/(b^2*Log[8])
```

Maple [A]
time = 0.01, size = 29, normalized size = 0.66

method	result	size
risch	$-\frac{2(-2^xb+2a)\sqrt{a+2^xb}}{3b^2\ln(2)}$	29
meijerg	`error in int/gbinthm/express: unable to compute coeff\`	N/A

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a+2^x*b)^(1/2),x,method=_RETURNVERBOSE)
[Out] -2/3*(-2^x*b+2*a)*(a+2^x*b)^(1/2)/b^2/ln(2)
```

Maxima [A]
time = 0.28, size = 38, normalized size = 0.86

$$\frac{2\,(2^xb+a)^{\frac{3}{2}}}{3\,b^2\log{(2)}} - \frac{2\,\sqrt{2^xb+a}\,a}{b^2\log{(2)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a+2^x*b)^(1/2),x, algorithm="maxima")
```

```
[Out] 2/3*(2^x*b + a)^(3/2)/(b^2*log(2)) - 2*sqrt(2^x*b + a)*a/(b^2*log(2))
```

Fricas [A]
time = 0.37, size = 27, normalized size = 0.61

$$\frac{2\sqrt{2^x b + a}\,(2^x b - 2a)}{3b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a+2^x*b)^(1/2),x, algorithm="fricas")
[Out] 2/3*sqrt(2^x*b + a)*(2^x*b - 2*a)/(b^2*log(2))
```

Sympy [A]
time = 0.35, size = 58, normalized size = 1.32

$$\begin{cases} \frac{2\cdot 2^x\sqrt{2^x b + a}}{3b\log(2)} - \frac{4a\sqrt{2^x b + a}}{3b^2\log(2)} & \text{for } b \neq 0 \\ \frac{2^{2x}}{2\sqrt{a}\log(2)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**(2*x)/(a+2**x*b)**(1/2),x)
[Out] Piecewise((2*2**x*sqrt(2**x*b + a)/(3*b*log(2)) - 4*a*sqrt(2**x*b + a)/(3*b
**2*log(2)), Ne(b, 0)), (2**(2*x)/(2*sqrt(a)*log(2)), True))
```

Giac [A]
time = 2.99, size = 31, normalized size = 0.70

$$\frac{2\left((2^x b + a)^{\frac{3}{2}} - 3\sqrt{2^x b + a}\,a\right)}{3b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a+2^x*b)^(1/2),x, algorithm="giac")
[Out] 2/3*((2^x*b + a)^(3/2) - 3*sqrt(2^x*b + a)*a)/(b^2*log(2))
```

Mupad [B]
time = 3.62, size = 28, normalized size = 0.64

$$-\frac{2\sqrt{a + 2^x b}\,(2a - 2^x b)}{3b^2\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a + 2^x*b)^(1/2),x)
[Out] -(2*(a + 2^x*b)^(1/2)*(2*a - 2^x*b))/(3*b^2*log(2))
```

3.499 $\int \frac{4^x}{\sqrt{a-2^x b}}\,dx$

Optimal. Leaf size=46

$$-\frac{2a\sqrt{a-2^x b}}{b^2\log(2)}+\frac{2(a-2^x b)^{3/2}}{3b^2\log(2)}$$

```
[Out] 2/3*(a-2^x*b)^(3/2)/b^2/ln(2)-2*a*(a-2^x*b)^(1/2)/b^2/ln(2)
```

Rubi [A]

time = 0.03, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {2280, 45}

$$\frac{2(a-b2^x)^{3/2}}{3b^2\log(2)}-\frac{2a\sqrt{a-b2^x}}{b^2\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[4^x/Sqrt[a - 2^x*b],x]
```

```
[Out] (-2*a*Sqrt[a - 2^x*b])/(b^2*Log[2]) + (2*(a - 2^x*b)^(3/2))/(3*b^2*Log[2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{4^x}{\sqrt{a-2^x b}}\,dx = \frac{\text{Subst}\left(\int \frac{x}{\sqrt{a-bx}}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{a}{b\sqrt{a-bx}} - \frac{\sqrt{a-bx}}{b}\right)dx, x, 2^x\right)}{\log(2)}$$
$$= -\frac{2a\sqrt{a-2^x b}}{b^2\log(2)} + \frac{2(a-2^x b)^{3/2}}{3b^2\log(2)}$$

Mathematica [A]
time = 0.06, size = 30, normalized size = 0.65

$$-\frac{2\sqrt{a-2^x b}\,(2a+2^x b)}{b^2\log(8)}$$

Antiderivative was successfully verified.

```
[In] Integrate[4^x/Sqrt[a - 2^x*b],x]
[Out] (-2*Sqrt[a - 2^x*b]*(2*a + 2^x*b))/(b^2*Log[8])
```

Maple [A]
time = 0.01, size = 29, normalized size = 0.63

method	result	size
risch	$-\frac{2(2^x b+2a)\sqrt{a-2^x b}}{3b^2\ln(2)}$	29
meijerg	`error in int/gbinthm/express: unable to compute coeff\`	N/A

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a-2^x*b)^(1/2),x,method=_RETURNVERBOSE)
[Out] -2/3*(2^x*b+2*a)/b^2*(a-2^x*b)^(1/2)/ln(2)
```

Maxima [A]
time = 0.49, size = 71, normalized size = 1.54

$$\frac{2^{2x+1}}{3\sqrt{-2^x b+a}\,\log(2)} + \frac{2^{x+1}a}{3\sqrt{-2^x b+a}\,b\log(2)} - \frac{4a^2}{3\sqrt{-2^x b+a}\,b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a-2^x*b)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/3*2^(2*x + 1)/(sqrt(-2^x*b + a)*log(2)) + 1/3*2^(x + 1)*a/(sqrt(-2^x*b +
a)*b*log(2)) - 4/3*a^2/(sqrt(-2^x*b + a)*b^2*log(2))
```

Fricas [A]
time = 0.35, size = 28, normalized size = 0.61

$$-\frac{2\,(2^{x}b+2\,a)\sqrt{-2^{x}b+a}}{3\,b^{2}\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a-2^x*b)^(1/2),x, algorithm="fricas")
[Out] -2/3*(2^x*b + 2*a)*sqrt(-2^x*b + a)/(b^2*log(2))
```

Sympy [A]
time = 0.36, size = 58, normalized size = 1.26

$$\begin{cases} -\frac{2\cdot 2^{x}\sqrt{-2^{x}b+a}}{3b\log\left(2\right)}-\frac{4a\sqrt{-2^{x}b+a}}{3b^{2}\log\left(2\right)} & \text{for}\ b\neq 0 \\ \frac{4^{x}}{2\sqrt{a}\,\log\left(2\right)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4**x/(a-2**x*b)**(1/2),x)
[Out] Piecewise((-2*2**x*sqrt(-2**x*b + a)/(3*b*log(2)) - 4*a*sqrt(-2**x*b + a)/(
3*b**2*log(2)), Ne(b, 0)), (4**x/(2*sqrt(a)*log(2)), True))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a-2^x*b)^(1/2),x, algorithm="giac")
[Out] integrate(4^x/sqrt(-2^x*b + a), x)
```

Mupad [B]
time = 3.64, size = 28, normalized size = 0.61

$$-\frac{2\,\sqrt{a-2^{x}\,b}\,\left(2\,a+2^{x}\,b\right)}{3\,b^{2}\,\ln\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a - 2^x*b)^(1/2),x)
[Out] -(2*(a - 2^x*b)^(1/2)*(2*a + 2^x*b))/(3*b^2*log(2))
```

3.500 $\int \frac{2^{2x}}{\sqrt{a-2^x b}}\,dx$

Optimal. Leaf size=46

$$-\frac{2a\sqrt{a-2^x b}}{b^2\log(2)}+\frac{2(a-2^x b)^{3/2}}{3b^2\log(2)}$$

```
[Out] 2/3*(a-2^x*b)^(3/2)/b^2/ln(2)-2*a*(a-2^x*b)^(1/2)/b^2/ln(2)
```

Rubi [A]

time = 0.03, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2280, 45}

$$\frac{2(a-b2^x)^{3/2}}{3b^2\log(2)}-\frac{2a\sqrt{a-b2^x}}{b^2\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^(2*x)/Sqrt[a - 2^x*b],x]
```

```
[Out] (-2*a*Sqrt[a - 2^x*b])/(b^2*Log[2]) + (2*(a - 2^x*b)^(3/2))/(3*b^2*Log[2])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^{2x}}{\sqrt{a-2^xb}}\,dx = \frac{\text{Subst}\left(\int \frac{x}{\sqrt{a-bx}}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{a}{b\sqrt{a-bx}} - \frac{\sqrt{a-bx}}{b}\right) dx, x, 2^x\right)}{\log(2)}$$
$$= -\frac{2a\sqrt{a-2^xb}}{b^2\log(2)} + \frac{2(a-2^xb)^{3/2}}{3b^2\log(2)}$$

Mathematica [A]
time = 0.01, size = 30, normalized size = 0.65

$$-\frac{2\sqrt{a-2^xb}\,(2a+2^xb)}{b^2\log(8)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^(2*x)/Sqrt[a - 2^x*b],x]
[Out] (-2*Sqrt[a - 2^x*b]*(2*a + 2^x*b))/(b^2*Log[8])
```

Maple [A]
time = 0.01, size = 29, normalized size = 0.63

method	result	size
risch	$-\frac{2(2^xb+2a)\sqrt{a-2^xb}}{3b^2\ln(2)}$	29
meijerg	`error in int/gbinthm/express: unable to compute coeff\`	N/A

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a-2^x*b)^(1/2),x,method=_RETURNVERBOSE)
[Out] -2/3*(2^x*b+2*a)/b^2*(a-2^x*b)^(1/2)/ln(2)
```

Maxima [A]
time = 0.28, size = 40, normalized size = 0.87

$$\frac{2\left(-2^xb+a\right)^{\frac{3}{2}}}{3\,b^2\log\left(2\right)} - \frac{2\,\sqrt{-2^xb+a}\,a}{b^2\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a-2^x*b)^(1/2),x, algorithm="maxima")
```

```
[Out] 2/3*(-2^x*b + a)^(3/2)/(b^2*log(2)) - 2*sqrt(-2^x*b + a)*a/(b^2*log(2))
```

Fricas [A]
time = 0.35, size = 28, normalized size = 0.61

$$-\frac{2\,(2^x b + 2\,a)\sqrt{-2^x b + a}}{3\,b^2 \log{(2)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a-2^x*b)^(1/2),x, algorithm="fricas")
[Out] -2/3*(2^x*b + 2*a)*sqrt(-2^x*b + a)/(b^2*log(2))
```

Sympy [A]
time = 0.37, size = 60, normalized size = 1.30

$$\begin{cases} -\frac{2\cdot 2^x\sqrt{-2^x b + a}}{3b\log{(2)}} - \frac{4a\sqrt{-2^x b + a}}{3b^2\log{(2)}} & \text{for}\ b \neq 0 \\ \frac{2^{2x}}{2\sqrt{a}\,\log{(2)}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**(2*x)/(a-2**x*b)**(1/2),x)
[Out] Piecewise((-2*2**x*sqrt(-2**x*b + a)/(3*b*log(2)) - 4*a*sqrt(-2**x*b + a)/(
3*b**2*log(2)), Ne(b, 0)), (2**(2*x)/(2*sqrt(a)*log(2)), True))
```

Giac [A]
time = 4.30, size = 33, normalized size = 0.72

$$\frac{2\left((-2^x b + a)^{\frac{3}{2}} - 3\,\sqrt{-2^x b + a}\,a\right)}{3\,b^2 \log{(2)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a-2^x*b)^(1/2),x, algorithm="giac")
[Out] 2/3*((-2^x*b + a)^(3/2) - 3*sqrt(-2^x*b + a)*a)/(b^2*log(2))
```

Mupad [B]
time = 3.54, size = 28, normalized size = 0.61

$$-\frac{2\,\sqrt{a - 2^x\,b}\,\left(2\,a + 2^x\,b\right)}{3\,b^2\,\ln{(2)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a - 2^x*b)^(1/2),x)
[Out] -(2*(a - 2^x*b)^(1/2)*(2*a + 2^x*b))/(3*b^2*log(2))
```

3.501 $\int \frac{4^x}{\sqrt{a+2^{-x}b}}\,dx$

Optimal. Leaf size=93

$$\frac{2^{-1+2x}\sqrt{a+2^{-x}b}}{a\log(2)}-\frac{3\,2^{-2+x}b\sqrt{a+2^{-x}b}}{a^2\log(2)}+\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a+2^{-x}b}}{\sqrt{a}}\right)}{4a^{5/2}\log(2)}$$

```
[Out] 3/4*b^2*arctanh((a+b/(2^x))^(1/2)/a^(1/2))/a^(5/2)/ln(2)+2^(-1+2*x)*(a+b/(2
^x))^(1/2)/a/ln(2)-3*2^(-2+x)*b*(a+b/(2^x))^(1/2)/a^2/ln(2)
```

Rubi [A]
time = 0.05, antiderivative size = 93, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.235$, Rules used = {2280, 44, 65, 214}

$$\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a+b2^{-x}}}{\sqrt{a}}\right)}{4a^{5/2}\log(2)}-\frac{3b2^{x-2}\sqrt{a+b2^{-x}}}{a^2\log(2)}+\frac{2^{2x-1}\sqrt{a+b2^{-x}}}{a\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[4^x/Sqrt[a + b/2^x],x]
```

```
[Out] (2^(-1 + 2*x)*Sqrt[a + b/2^x])/(a*Log[2]) - (3*2^(-2 + x)*b*Sqrt[a + b/2^x]
)/(a^2*Log[2]) + (3*b^2*ArcTanh[Sqrt[a + b/2^x]/Sqrt[a]])/(4*a^(5/2)*Log[2]
)
```

Rule 44

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, -1] &&  !Int
egerQ[n] && LtQ[n, 0]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{4^x}{\sqrt{a+2^{-x}b}}\,dx &= -\frac{\text{Subst}\left(\int \frac{1}{x^3\sqrt{a+bx}}\,dx, x, 2^{-x}\right)}{\log(2)}\\
&= \frac{2^{-1+2x}\sqrt{a+2^{-x}b}}{a\log(2)} + \frac{(3b)\text{Subst}\left(\int \frac{1}{x^2\sqrt{a+bx}}\,dx, x, 2^{-x}\right)}{4a\log(2)}\\
&= \frac{2^{-1+2x}\sqrt{a+2^{-x}b}}{a\log(2)} - \frac{3\,2^{-2+x}b\sqrt{a+2^{-x}b}}{a^2\log(2)} - \frac{(3b^2)\,\text{Subst}\left(\int \frac{1}{x\sqrt{a+bx}}\,dx, x, 2^{-x}\right)}{8a^2\log(2)}\\
&= \frac{2^{-1+2x}\sqrt{a+2^{-x}b}}{a\log(2)} - \frac{3\,2^{-2+x}b\sqrt{a+2^{-x}b}}{a^2\log(2)} - \frac{(3b)\text{Subst}\left(\int \frac{1}{-\frac{a}{b}+\frac{x^2}{b}}\,dx, x, \sqrt{a+2^{-x}b}\right)}{4a^2\log(2)}\\
&= \frac{2^{-1+2x}\sqrt{a+2^{-x}b}}{a\log(2)} - \frac{3\,2^{-2+x}b\sqrt{a+2^{-x}b}}{a^2\log(2)} + \frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a+2^{-x}b}}{\sqrt{a}}\right)}{4a^{5/2}\log(2)}
\end{aligned}$$

Mathematica [A]
time = 0.28, size = 111, normalized size = 1.19

$$\frac{2^{-2-\frac{x}{2}}\left(2^{x/2}\sqrt{a}\,(2^{1+2x}a^2-2^xab-3b^2)+3b^2\sqrt{2^xa+b}\,\tanh^{-1}\left(\frac{2^{x/2}\sqrt{a}}{\sqrt{2^xa+b}}\right)\right)}{a^{5/2}\sqrt{a+2^{-x}b}\,\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[4^x/Sqrt[a + b/2^x],x]
```

```
[Out] (2^(-2 - x/2)*(2^(x/2)*Sqrt[a]*(2^(1 + 2*x)*a^2 - 2^x*a*b - 3*b^2) + 3*b^2*
Sqrt[2^x*a + b]*ArcTanh[(2^(x/2)*Sqrt[a])/Sqrt[2^x*a + b]]))/(a^(5/2)*Sqrt[
a + b/2^x]*Log[2])
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{4^x}{\sqrt{a+b2^{-x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a+b/(2^x))^(1/2),x)
```

```
[Out] int(4^x/(a+b/(2^x))^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a+b/(2^x))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(4^x/sqrt(a + b/2^x), x)
```

Fricas [A]
time = 0.37, size = 166, normalized size = 1.78

$$\left[\frac{3\sqrt{a}\,b^2\log\left(2\cdot 2^x a+2\cdot 2^x\sqrt{a}\sqrt{\frac{2^x a+b}{2^x}}+b\right)+2\left(2\cdot 2^{2x}a^2-3\cdot 2^x ab\right)\sqrt{\frac{2^x a+b}{2^x}}}{8a^3\log(2)},\ -\frac{3\sqrt{-a}\,b^2\arctan\left(\frac{\sqrt{-a}\sqrt{\frac{2^x a+b}{2^x}}}{a}\right)-\left(2\cdot 2^{2x}a^2-3\cdot 2^x ab\right)\sqrt{\frac{2^x a+b}{2^x}}}{4a^3\log(2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a+b/(2^x))^(1/2),x, algorithm="fricas")
```

```
[Out] [1/8*(3*sqrt(a)*b^2*log(2*2^x*a + 2*2^x*sqrt(a)*sqrt((2^x*a + b)/2^x) + b)
+ 2*(2*2^(2*x)*a^2 - 3*2^x*a*b)*sqrt((2^x*a + b)/2^x))/(a^3*log(2)), -1/4*(
3*sqrt(-a)*b^2*arctan(sqrt(-a)*sqrt((2^x*a + b)/2^x)/a) - (2*2^(2*x)*a^2 -
3*2^x*a*b)*sqrt((2^x*a + b)/2^x))/(a^3*log(2))]
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{4^x}{\sqrt{a+2^{-x}b}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4**x/(a+b/(2**x))**(1/2),x)
```

```
[Out] Integral(4**x/sqrt(a + b/2**x), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a+b/(2^x))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(4^x/sqrt(a + b/2^x), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{4^x}{\sqrt{a+\frac{b}{2^x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a + b/2^x)^(1/2),x)
```

```
[Out] int(4^x/(a + b/2^x)^(1/2), x)
```

3.502 $\int \frac{2^{2x}}{\sqrt{a+2^{-x}b}}\,dx$

Optimal. Leaf size=93

$$\frac{2^{-1+2x}\sqrt{a+2^{-x}b}}{a\log(2)}-\frac{3\ 2^{-2+x}b\sqrt{a+2^{-x}b}}{a^2\log(2)}+\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a+2^{-x}b}}{\sqrt{a}}\right)}{4a^{5/2}\log(2)}$$

```
[Out] 3/4*b^2*arctanh((a+b/(2^x))^(1/2)/a^(1/2))/a^(5/2)/ln(2)+2^(-1+2*x)*(a+b/(2
^x))^(1/2)/a/ln(2)-3*2^(-2+x)*b*(a+b/(2^x))^(1/2)/a^2/ln(2)
```

Rubi [A]
time = 0.05, antiderivative size = 93, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.210, Rules used = {2280, 44, 65, 214}

$$\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a+b2^{-x}}}{\sqrt{a}}\right)}{4a^{5/2}\log(2)}-\frac{3b2^{x-2}\sqrt{a+b2^{-x}}}{a^2\log(2)}+\frac{2^{2x-1}\sqrt{a+b2^{-x}}}{a\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^(2*x)/Sqrt[a + b/2^x],x]
```

```
[Out] (2^(-1 + 2*x)*Sqrt[a + b/2^x])/(a*Log[2]) - (3*2^(-2 + x)*b*Sqrt[a + b/2^x]
)/(a^2*Log[2]) + (3*b^2*ArcTanh[Sqrt[a + b/2^x]/Sqrt[a]])/(4*a^(5/2)*Log[2]
)
```

Rule 44

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, -1] &&  !Int
egerQ[n] && LtQ[n, 0]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^{2x}}{\sqrt{a+2^{-x}b}}\,dx = -\frac{\text{Subst}\left(\int \frac{1}{x^3\sqrt{a+bx}}\,dx, x, 2^{-x}\right)}{\log(2)}$$

$$= \frac{2^{-1+2x}\sqrt{a+2^{-x}b}}{a\log(2)} + \frac{(3b)\text{Subst}\left(\int \frac{1}{x^2\sqrt{a+bx}}\,dx, x, 2^{-x}\right)}{4a\log(2)}$$

$$= \frac{2^{-1+2x}\sqrt{a+2^{-x}b}}{a\log(2)} - \frac{3\ 2^{-2+x}b\sqrt{a+2^{-x}b}}{a^2\log(2)} - \frac{(3b^2)\,\text{Subst}\left(\int \frac{1}{x\sqrt{a+bx}}\,dx, x, 2^{-x}\right)}{8a^2\log(2)}$$

$$= \frac{2^{-1+2x}\sqrt{a+2^{-x}b}}{a\log(2)} - \frac{3\ 2^{-2+x}b\sqrt{a+2^{-x}b}}{a^2\log(2)} - \frac{(3b)\text{Subst}\left(\int \frac{1}{-\frac{a}{b}+\frac{x^2}{b}}\,dx, x, \sqrt{a+2^{-x}b}\right)}{4a^2\log(2)}$$

$$= \frac{2^{-1+2x}\sqrt{a+2^{-x}b}}{a\log(2)} - \frac{3\ 2^{-2+x}b\sqrt{a+2^{-x}b}}{a^2\log(2)} + \frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a+2^{-x}b}}{\sqrt{a}}\right)}{4a^{5/2}\log(2)}$$

Mathematica [A]
time = 0.02, size = 111, normalized size = 1.19

$$\frac{2^{-2-\frac{x}{2}}\left(2^{x/2}\sqrt{a}\,(2^{1+2x}a^2-2^x ab-3b^2)+3b^2\sqrt{2^x a+b}\,\tanh^{-1}\left(\frac{2^{x/2}\sqrt{a}}{\sqrt{2^x a+b}}\right)\right)}{a^{5/2}\sqrt{a+2^{-x}b}\,\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^(2*x)/Sqrt[a + b/2^x],x]
```

```
[Out] (2^(-2 - x/2)*(2^(x/2)*Sqrt[a]*(2^(1 + 2*x)*a^2 - 2^x*a*b - 3*b^2) + 3*b^2*
Sqrt[2^x*a + b]*ArcTanh[(2^(x/2)*Sqrt[a])/Sqrt[2^x*a + b]]))/(a^(5/2)*Sqrt[
a + b/2^x]*Log[2])
```

Maple [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2^{2x}}{\sqrt{a + b2^{-x}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a+b/(2^x))^(1/2),x)
```

```
[Out] int(2^(2*x)/(a+b/(2^x))^(1/2),x)
```

Maxima [A]
time = 0.49, size = 124, normalized size = 1.33

$$-\frac{3\,b^2\log\left(\frac{\sqrt{a + \frac{b}{2^x}} - \sqrt{a}}{\sqrt{a + \frac{b}{2^x}} + \sqrt{a}}\right)}{8\,a^{\frac{5}{2}}\log\left(2\right)} - \frac{3\left(a + \frac{b}{2^x}\right)^{\frac{3}{2}}b^2 - 5\sqrt{a + \frac{b}{2^x}}\,ab^2}{4\left(\left(a + \frac{b}{2^x}\right)^2 a^2 - 2\left(a + \frac{b}{2^x}\right)a^3 + a^4\right)\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a+b/(2^x))^(1/2),x, algorithm="maxima")
```

```
[Out] -3/8*b^2*log((sqrt(a + b/2^x) - sqrt(a))/(sqrt(a + b/2^x) + sqrt(a)))/(a^(5
/2)*log(2)) - 1/4*(3*(a + b/2^x)^(3/2)*b^2 - 5*sqrt(a + b/2^x)*a*b^2)/(((a
+ b/2^x)^2*a^2 - 2*(a + b/2^x)*a^3 + a^4)*log(2))
```

Fricas [A]
time = 0.36, size = 166, normalized size = 1.78

$$\left[\frac{3\,\sqrt{a}\,b^2\log\left(2\cdot 2^x a + 2\cdot 2^x\sqrt{a}\sqrt{\frac{2^x a + b}{2^x}} + b\right) + 2\left(2\cdot 2^{2\,x}a^2 - 3\cdot 2^x ab\right)\sqrt{\frac{2^x a + b}{2^x}}}{8\,a^3\log\left(2\right)}, -\frac{3\,\sqrt{-a}\,b^2\arctan\left(\frac{\sqrt{-a}\sqrt{\frac{2^x a + b}{2^x}}}{a}\right) - \left(2\cdot 2^{2\,x}a^2 - 3\cdot 2^x ab\right)\sqrt{\frac{2^x a + b}{2^x}}}{4\,a^3\log\left(2\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a+b/(2^x))^(1/2),x, algorithm="fricas")
```

```
[Out] [1/8*(3*sqrt(a)*b^2*log(2*2^x*a + 2*2^x*sqrt(a)*sqrt((2^x*a + b)/2^x) + b)
+ 2*(2*2^(2*x)*a^2 - 3*2^x*a*b)*sqrt((2^x*a + b)/2^x))/(a^3*log(2)), -1/4*(
```

```
3*sqrt(-a)*b^2*arctan(sqrt(-a)*sqrt((2^x*a + b)/2^x)/a) - (2*2^(2*x)*a^2 -
3*2^x*a*b)*sqrt((2^x*a + b)/2^x))/(a^3*log(2))]
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2^{2x}}{\sqrt{a+2^{-x}b}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**(2*x)/(a+b/(2**x))**(1/2),x)
```

```
[Out] Integral(2**(2*x)/sqrt(a + b/2**x), x)
```

Giac [**A**]
time = 5.69, size = 94, normalized size = 1.01

$$\frac{2\sqrt{2^{2x}a+2^{x}b}\left(\frac{2\cdot 2^{x}}{a}-\frac{3b}{a^{2}}\right)-\frac{3b^{2}\log\left(\left|-2\left(2^{x}\sqrt{a}-\sqrt{2^{2x}a+2^{x}b}\right)\sqrt{a}-b\right|\right)}{a^{\frac{5}{2}}}+\frac{3b^{2}\log\left(|b|\right)}{a^{\frac{5}{2}}}}{8\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a+b/(2^x))^(1/2),x, algorithm="giac")
```

```
[Out] 1/8*(2*sqrt(2^(2*x)*a + 2^x*b)*(2*2^x/a - 3*b/a^2) - 3*b^2*log(abs(-2*(2^x*
sqrt(a) - sqrt(2^(2*x)*a + 2^x*b))*sqrt(a) - b))/a^(5/2) + 3*b^2*log(abs(b)
)/a^(5/2))/log(2)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{2^{2\,x}}{\sqrt{a+\frac{b}{2^x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a + b/2^x)^(1/2),x)
```

```
[Out] int(2^(2*x)/(a + b/2^x)^(1/2), x)
```

3.503 $\int \frac{4^x}{\sqrt{a-2^{-x}b}}\,dx$

Optimal. Leaf size=96

$$\frac{2^{-1+2x}\sqrt{a-2^{-x}b}}{a\log(2)}+\frac{3\ 2^{-2+x}b\sqrt{a-2^{-x}b}}{a^2\log(2)}+\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a-2^{-x}b}}{\sqrt{a}}\right)}{4a^{5/2}\log(2)}$$

```
[Out] 3/4*b^2*arctanh((a-b/(2^x))^(1/2)/a^(1/2))/a^(5/2)/ln(2)+2^(-1+2*x)*(a-b/(2
^x))^(1/2)/a/ln(2)+3*2^(-2+x)*b*(a-b/(2^x))^(1/2)/a^2/ln(2)
```

Rubi [A]
time = 0.05, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {2280, 44, 65, 214}

$$\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a-b2^{-x}}}{\sqrt{a}}\right)}{4a^{5/2}\log(2)}+\frac{3b2^{x-2}\sqrt{a-b2^{-x}}}{a^2\log(2)}+\frac{2^{2x-1}\sqrt{a-b2^{-x}}}{a\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[4^x/Sqrt[a - b/2^x],x]
```

```
[Out] (2^(-1 + 2*x)*Sqrt[a - b/2^x])/(a*Log[2]) + (3*2^(-2 + x)*b*Sqrt[a - b/2^x]
)/(a^2*Log[2]) + (3*b^2*ArcTanh[Sqrt[a - b/2^x]/Sqrt[a]])/(4*a^(5/2)*Log[2]
)
```

Rule 44

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, -1] &&  !Int
egerQ[n] && LtQ[n, 0]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{4^x}{\sqrt{a-2^{-x}b}}\,dx &= -\frac{\text{Subst}\left(\int \frac{1}{x^3\sqrt{a-bx}}\,dx, x, 2^{-x}\right)}{\log(2)}\\
&= \frac{2^{-1+2x}\sqrt{a-2^{-x}b}}{a\log(2)} - \frac{(3b)\text{Subst}\left(\int \frac{1}{x^2\sqrt{a-bx}}\,dx, x, 2^{-x}\right)}{4a\log(2)}\\
&= \frac{2^{-1+2x}\sqrt{a-2^{-x}b}}{a\log(2)} + \frac{3\ 2^{-2+x}b\sqrt{a-2^{-x}b}}{a^2\log(2)} - \frac{(3b^2)\ \text{Subst}\left(\int \frac{1}{x\sqrt{a-bx}}\,dx, x, 2^{-x}\right)}{8a^2\log(2)}\\
&= \frac{2^{-1+2x}\sqrt{a-2^{-x}b}}{a\log(2)} + \frac{3\ 2^{-2+x}b\sqrt{a-2^{-x}b}}{a^2\log(2)} + \frac{(3b)\text{Subst}\left(\int \frac{1}{\frac{a}{b}-\frac{x^2}{b}}\,dx, x, \sqrt{a-2^{-x}b}\right)}{4a^2\log(2)}\\
&= \frac{2^{-1+2x}\sqrt{a-2^{-x}b}}{a\log(2)} + \frac{3\ 2^{-2+x}b\sqrt{a-2^{-x}b}}{a^2\log(2)} + \frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a-2^{-x}b}}{\sqrt{a}}\right)}{4a^{5/2}\log(2)}
\end{aligned}$$

Mathematica [A]
time = 0.28, size = 115, normalized size = 1.20

$$\frac{2^{-2-\frac{x}{2}}\left(2^{x/2}\sqrt{a}\,(2^{1+2x}a^2+2^xab-3b^2)+3\sqrt{2^xa-b}\,b^2\tanh^{-1}\left(\frac{2^{x/2}\sqrt{a}}{\sqrt{2^xa-b}}\right)\right)}{a^{5/2}\sqrt{a-2^{-x}b}\,\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[4^x/Sqrt[a - b/2^x],x]
```

```
[Out] (2^(-2 - x/2)*(2^(x/2)*Sqrt[a]*(2^(1 + 2*x)*a^2 + 2^x*a*b - 3*b^2) + 3*Sqrt
[2^x*a - b]*b^2*ArcTanh[(2^(x/2)*Sqrt[a])/Sqrt[2^x*a - b]]))/(a^(5/2)*Sqrt[
a - b/2^x]*Log[2])
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{4^{x}}{\sqrt{a - b2^{-x}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a-b/(2^x))^(1/2),x)
```

```
[Out] int(4^x/(a-b/(2^x))^(1/2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a-b/(2^x))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(4^x/sqrt(a - b/2^x), x)
```

Fricas [A]
time = 0.39, size = 174, normalized size = 1.81

$$\left[\frac{3\,\sqrt{a}\,b^{2}\log\left(-2\cdot 2^{x}a - 2\cdot 2^{x}\sqrt{a}\,\sqrt{\frac{2^{x}a - b}{2^{x}}} + b\right) + 2\,(2\cdot 2^{2\,x}a^{2} + 3\cdot 2^{x}ab)\sqrt{\frac{2^{x}a - b}{2^{x}}}}{8\,a^{3}\log\left(2\right)}, -\frac{3\,\sqrt{-a}\,b^{2}\arctan\left(\frac{\sqrt{-a}\,\sqrt{\frac{2^{x}a - b}{2^{x}}}}{a}\right) - (2\cdot 2^{2\,x}a^{2} + 3\cdot 2^{x}ab)\sqrt{\frac{2^{x}a - b}{2^{x}}}}{4\,a^{3}\log\left(2\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a-b/(2^x))^(1/2),x, algorithm="fricas")
```

```
[Out] [1/8*(3*sqrt(a)*b^2*log(-2*2^x*a - 2*2^x*sqrt(a)*sqrt((2^x*a - b)/2^x) + b)
 + 2*(2*2^(2*x)*a^2 + 3*2^x*a*b)*sqrt((2^x*a - b)/2^x))/(a^3*log(2)), -1/4*
(3*sqrt(-a)*b^2*arctan(sqrt(-a)*sqrt((2^x*a - b)/2^x)/a) - (2*2^(2*x)*a^2 +
 3*2^x*a*b)*sqrt((2^x*a - b)/2^x))/(a^3*log(2))]
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{4^{x}}{\sqrt{a - 2^{-x}b}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4**x/(a-b/(2**x))**(1/2),x)
```

```
[Out] Integral(4**x/sqrt(a - b/2**x), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a-b/(2^x))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(4^x/sqrt(a - b/2^x), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{4^x}{\sqrt{a-\frac{b}{2^x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a - b/2^x)^(1/2),x)
```

```
[Out] int(4^x/(a - b/2^x)^(1/2), x)
```

3.504 $\int \frac{2^{2x}}{\sqrt{a-2^{-x}b}}\,dx$

Optimal. Leaf size=96

$$\frac{2^{-1+2x}\sqrt{a-2^{-x}b}}{a\log(2)}+\frac{3\ 2^{-2+x}b\sqrt{a-2^{-x}b}}{a^2\log(2)}+\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a-2^{-x}b}}{\sqrt{a}}\right)}{4a^{5/2}\log(2)}$$

```
[Out] 3/4*b^2*arctanh((a-b/(2^x))^(1/2)/a^(1/2))/a^(5/2)/ln(2)+2^(-1+2*x)*(a-b/(2
^x))^(1/2)/a/ln(2)+3*2^(-2+x)*b*(a-b/(2^x))^(1/2)/a^2/ln(2)
```

Rubi [A]
time = 0.06, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2280, 44, 65, 214}

$$\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a-b2^{-x}}}{\sqrt{a}}\right)}{4a^{5/2}\log(2)}+\frac{3b2^{x-2}\sqrt{a-b2^{-x}}}{a^2\log(2)}+\frac{2^{2x-1}\sqrt{a-b2^{-x}}}{a\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^(2*x)/Sqrt[a - b/2^x],x]
```

```
[Out] (2^(-1 + 2*x)*Sqrt[a - b/2^x])/(a*Log[2]) + (3*2^(-2 + x)*b*Sqrt[a - b/2^x]
)/(a^2*Log[2]) + (3*b^2*ArcTanh[Sqrt[a - b/2^x]/Sqrt[a]])/(4*a^(5/2)*Log[2]
)
```

Rule 44

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Dist[d*((
m + n + 2)/((b*c - a*d)*(m + 1))), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, -1] &&  !Int
egerQ[n] && LtQ[n, 0]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$
\begin{aligned}
\int \frac{2^{2x}}{\sqrt{a-2^{-x}b}}\,dx &= -\frac{\text{Subst}\left(\int \frac{1}{x^3\sqrt{a-bx}}\,dx,x,2^{-x}\right)}{\log(2)}\\
&= \frac{2^{-1+2x}\sqrt{a-2^{-x}b}}{a\log(2)}-\frac{(3b)\text{Subst}\left(\int \frac{1}{x^2\sqrt{a-bx}}\,dx,x,2^{-x}\right)}{4a\log(2)}\\
&= \frac{2^{-1+2x}\sqrt{a-2^{-x}b}}{a\log(2)}+\frac{3\ 2^{-2+x}b\sqrt{a-2^{-x}b}}{a^2\log(2)}-\frac{(3b^2)\,\text{Subst}\left(\int \frac{1}{x\sqrt{a-bx}}\,dx,x,2^{-x}\right)}{8a^2\log(2)}\\
&= \frac{2^{-1+2x}\sqrt{a-2^{-x}b}}{a\log(2)}+\frac{3\ 2^{-2+x}b\sqrt{a-2^{-x}b}}{a^2\log(2)}+\frac{(3b)\text{Subst}\left(\int \frac{1}{\frac{a}{b}-\frac{x^2}{b}}\,dx,x,\sqrt{a-2^{-x}b}\right)}{4a^2\log(2)}\\
&= \frac{2^{-1+2x}\sqrt{a-2^{-x}b}}{a\log(2)}+\frac{3\ 2^{-2+x}b\sqrt{a-2^{-x}b}}{a^2\log(2)}+\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a-2^{-x}b}}{\sqrt{a}}\right)}{4a^{5/2}\log(2)}
\end{aligned}
$$

Mathematica [A]
time = 0.01, size = 115, normalized size = 1.20

$$
\frac{2^{-2-\frac{x}{2}}\left(2^{x/2}\sqrt{a}\,(2^{1+2x}a^2+2^xab-3b^2)+3\sqrt{2^xa-b}\,b^2\tanh^{-1}\left(\frac{2^{x/2}\sqrt{a}}{\sqrt{2^xa-b}}\right)\right)}{a^{5/2}\sqrt{a-2^{-x}b}\,\log(2)}
$$

Antiderivative was successfully verified.

```
[In] Integrate[2^(2*x)/Sqrt[a - b/2^x],x]
```

```
[Out] (2^(-2 - x/2)*(2^(x/2)*Sqrt[a]*(2^(1 + 2*x)*a^2 + 2^x*a*b - 3*b^2) + 3*Sqrt
[2^x*a - b]*b^2*ArcTanh[(2^(x/2)*Sqrt[a])/Sqrt[2^x*a - b]]))/(a^(5/2)*Sqrt[
a - b/2^x]*Log[2])
```

Maple [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2^{2x}}{\sqrt{a - b2^{-x}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a-b/(2^x))^(1/2),x)
```

```
[Out] int(2^(2*x)/(a-b/(2^x))^(1/2),x)
```

Maxima [A]
time = 0.49, size = 130, normalized size = 1.35

$$-\frac{3\, b^2 \log\left(\frac{\sqrt{a - \frac{b}{2^x}} - \sqrt{a}}{\sqrt{a - \frac{b}{2^x}} + \sqrt{a}}\right)}{8\, a^{\frac{5}{2}} \log\left(2\right)} - \frac{3\left(a - \frac{b}{2^x}\right)^{\frac{3}{2}} b^2 - 5\sqrt{a - \frac{b}{2^x}}\, ab^2}{4\left(\left(a - \frac{b}{2^x}\right)^2 a^2 - 2\left(a - \frac{b}{2^x}\right)a^3 + a^4\right)\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a-b/(2^x))^(1/2),x, algorithm="maxima")
```

```
[Out] -3/8*b^2*log((sqrt(a - b/2^x) - sqrt(a))/(sqrt(a - b/2^x) + sqrt(a)))/(a^(5
/2)*log(2)) - 1/4*(3*(a - b/2^x)^(3/2)*b^2 - 5*sqrt(a - b/2^x)*a*b^2)/(((a
- b/2^x)^2*a^2 - 2*(a - b/2^x)*a^3 + a^4)*log(2))
```

Fricas [A]
time = 0.36, size = 174, normalized size = 1.81

$$\left[\frac{3\sqrt{a}\, b^2 \log\left(-2 \cdot 2^x a - 2 \cdot 2^x \sqrt{a}\sqrt{\frac{2^x a - b}{2^x}} + b\right) + 2\left(2 \cdot 2^{2x} a^2 + 3 \cdot 2^x ab\right)\sqrt{\frac{2^x a - b}{2^x}}}{8\, a^3 \log\left(2\right)}, -\frac{3\sqrt{-a}\, b^2 \arctan\left(\frac{\sqrt{-a}\sqrt{\frac{2^x a - b}{2^x}}}{a}\right) - \left(2 \cdot 2^{2x} a^2 + 3 \cdot 2^x ab\right)\sqrt{\frac{2^x a - b}{2^x}}}{4\, a^3 \log\left(2\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a-b/(2^x))^(1/2),x, algorithm="fricas")
```

```
[Out] [1/8*(3*sqrt(a)*b^2*log(-2*2^x*a - 2*2^x*sqrt(a)*sqrt((2^x*a - b)/2^x) + b)
 + 2*(2*2^(2*x)*a^2 + 3*2^x*a*b)*sqrt((2^x*a - b)/2^x))/(a^3*log(2)), -1/4*
```

```
(3*sqrt(-a)*b^2*arctan(sqrt(-a)*sqrt((2^x*a - b)/2^x)/a) - (2*2^(2*x)*a^2 +
 3*2^x*a*b)*sqrt((2^x*a - b)/2^x))/(a^3*log(2))]
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2^{2x}}{\sqrt{a - 2^{-x}b}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**(2*x)/(a-b/(2**x))**(1/2),x)
```

```
[Out] Integral(2**(2*x)/sqrt(a - b/2**x), x)
```

Giac [A]
time = 5.71, size = 96, normalized size = 1.00

$$\frac{2\sqrt{2^{2x}a - 2^{x}b}\left(\frac{2\cdot 2^{x}}{a} + \frac{3b}{a^{2}}\right) - \frac{3b^{2}\log\left(\left|2\left(2^{x}\sqrt{a} - \sqrt{2^{2x}a - 2^{x}b}\right)\sqrt{a} - b\right|\right)}{a^{\frac{5}{2}}} + \frac{3b^{2}\log\left(|b|\right)}{a^{\frac{5}{2}}}}{8\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a-b/(2^x))^(1/2),x, algorithm="giac")
```

```
[Out] 1/8*(2*sqrt(2^(2*x)*a - 2^x*b)*(2*2^x/a + 3*b/a^2) - 3*b^2*log(abs(2*(2^x*s
qrt(a) - sqrt(2^(2*x)*a - 2^x*b))*sqrt(a) - b))/a^(5/2) + 3*b^2*log(abs(b))
/a^(5/2))/log(2)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{2^{2\,x}}{\sqrt{a-\frac{b}{2^x}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a - b/2^x)^(1/2),x)
```

```
[Out] int(2^(2*x)/(a - b/2^x)^(1/2), x)
```

3.505 $\int \frac{1}{1+2e^x+e^{2x}}\,dx$

Optimal. Leaf size=17

$$\frac{1}{1+e^x}+x-\log\left(1+e^x\right)$$

[Out] 1/(1+exp(x))+x-ln(1+exp(x))

Rubi [A]
time = 0.01, antiderivative size = 17, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2320, 46}

$$x+\frac{1}{e^x+1}-\log\left(e^x+1\right)$$

Antiderivative was successfully verified.

[In] Int[(1 + 2*E^x + E^(2*x))^(-1),x]

[Out] (1 + E^x)^(-1) + x - Log[1 + E^x]

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{1+2e^x+e^{2x}}\,dx &= \text{Subst}\left(\int \frac{1}{x(1+x)^2}\,dx,x,e^x\right)\\ &= \text{Subst}\left(\int \left(\frac{1}{-1-x}+\frac{1}{x}-\frac{1}{(1+x)^2}\right)\,dx,x,e^x\right)\\ &= \frac{1}{1+e^x}+x-\log\left(1+e^x\right)\end{aligned}$$

Mathematica [A]
time = 0.02, size = 18, normalized size = 1.06

$$\frac{1}{1+e^x}-2\tanh^{-1}(1+2e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 + 2*E^x + E^(2*x))^(-1),x]
```

```
[Out] (1 + E^x)^(-1) - 2*ArcTanh[1 + 2*E^x]
```

Maple [A]
time = 0.02, size = 18, normalized size = 1.06

method	result	size
risch	$\frac{1}{1+e^x}+x-\ln(1+e^x)$	16
default	$\frac{1}{1+e^x}-\ln(1+e^x)+\ln(e^x)$	18
norman	$\frac{x+e^x x+1}{1+e^x}-\ln(1+e^x)$	23

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(1+2*exp(x)+exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/(1+exp(x))-ln(1+exp(x))+ln(exp(x))
```

Maxima [A]
time = 0.28, size = 15, normalized size = 0.88

$$x+\frac{1}{e^x+1}-\log(e^x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1+2*exp(x)+exp(2*x)),x, algorithm="maxima")
```

```
[Out] x + 1/(e^x + 1) - log(e^x + 1)
```

Fricas [A]
time = 0.35, size = 25, normalized size = 1.47

$$\frac{xe^x-(e^x+1)\log(e^x+1)+x+1}{e^x+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1+2*exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] (x*e^x - (e^x + 1)*log(e^x + 1) + x + 1)/(e^x + 1)
```

Sympy [A]
time = 0.02, size = 14, normalized size = 0.82

$$x - \log(e^x + 1) + \frac{1}{e^x + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1+2*exp(x)+exp(2*x)),x)
[Out] x - log(exp(x) + 1) + 1/(exp(x) + 1)
```

Giac [A]
time = 4.32, size = 15, normalized size = 0.88

$$x + \frac{1}{e^x + 1} - \log(e^x + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1+2*exp(x)+exp(2*x)),x, algorithm="giac")
[Out] x + 1/(e^x + 1) - log(e^x + 1)
```

Mupad [B]
time = 3.26, size = 15, normalized size = 0.88

$$x - \ln(\mathrm{e}^x + 1) + \frac{1}{\mathrm{e}^x + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(exp(2*x) + 2*exp(x) + 1),x)
[Out] x - log(exp(x) + 1) + 1/(exp(x) + 1)
```

3.506 $\int \frac{1}{2+3e^x+e^{2x}} \, dx$

Optimal. Leaf size=24

$$\frac{x}{2} - \log(1+e^x) + \frac{1}{2}\log(2+e^x)$$

```
[Out] 1/2*x-ln(1+exp(x))+1/2*ln(2+exp(x))
```

Rubi [A]
time = 0.01, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.357$, Rules used = {2320, 719, 29, 646, 31}

$$\frac{x}{2} - \log(e^x+1) + \frac{1}{2}\log(e^x+2)$$

Antiderivative was successfully verified.

```
[In] Int[(2 + 3*E^x + E^(2*x))^(-1),x]
```

```
[Out] x/2 - Log[1 + E^x] + Log[2 + E^x]/2
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 646

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> W
ith[{q = Rt[b^2 - 4*a*c, 2]}, Dist[(c*d - e*(b/2 - q/2))/q, Int[1/(b/2 - q/
2 + c*x), x], x] - Dist[(c*d - e*(b/2 + q/2))/q, Int[1/(b/2 + q/2 + c*x), x
], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[2*c*d - b*e, 0] && NeQ[b^2 - 4*a
*c, 0] && NiceSqrtQ[b^2 - 4*a*c]
```

Rule 719

```
Int[1/(((d_.) + (e_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)), x_Symbol]
 :> Dist[e^2/(c*d^2 - b*d*e + a*e^2), Int[1/(d + e*x), x], x] + Dist[1/(c*d
^2 - b*d*e + a*e^2), Int[(c*d - b*e - c*e*x)/(a + b*x + c*x^2), x], x] /; F
reeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^
2, 0] && NeQ[2*c*d - b*e, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{2+3e^x+e^{2x}}\,dx &= \text{Subst}\left(\int \frac{1}{x\,(2+3x+x^2)}\,dx, x, e^x\right)\\
&= \frac{1}{2}\text{Subst}\left(\int \frac{1}{x}\,dx, x, e^x\right)+\frac{1}{2}\text{Subst}\left(\int \frac{-3-x}{2+3x+x^2}\,dx, x, e^x\right)\\
&= \frac{x}{2}+\frac{1}{2}\text{Subst}\left(\int \frac{1}{2+x}\,dx, x, e^x\right)-\text{Subst}\left(\int \frac{1}{1+x}\,dx, x, e^x\right)\\
&= \frac{x}{2}-\log\left(1+e^x\right)+\frac{1}{2}\log\left(2+e^x\right)
\end{aligned}$$

Mathematica [A]
time = 0.02, size = 27, normalized size = 1.12

$$\frac{\log\left(e^x\right)}{2}-\log\left(1+e^x\right)+\frac{1}{2}\log\left(2+e^x\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(2 + 3*E^x + E^(2*x))^(-1),x]
[Out] Log[E^x]/2 - Log[1 + E^x] + Log[2 + E^x]/2
```

Maple [A]
time = 0.02, size = 21, normalized size = 0.88

method	result	size
norman	$\frac{x}{2}-\ln\left(1+e^x\right)+\frac{\ln(2+e^x)}{2}$	19
risch	$\frac{x}{2}-\ln\left(1+e^x\right)+\frac{\ln(2+e^x)}{2}$	19
default	$\frac{\ln(2+e^x)}{2}-\ln\left(1+e^x\right)+\frac{\ln(e^x)}{2}$	21

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(2+3*exp(x)+exp(2*x)),x,method=_RETURNVERBOSE)
[Out] 1/2*ln(2+exp(x))-ln(1+exp(x))+1/2*ln(exp(x))
```

Maxima [A]
time = 0.30, size = 18, normalized size = 0.75

$$\frac{1}{2}\,x+\frac{1}{2}\,\log\left(e^{x}+2\right)-\log\left(e^{x}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+3*exp(x)+exp(2*x)),x, algorithm="maxima")
[Out] 1/2*x + 1/2*log(e^x + 2) - log(e^x + 1)
```

Fricas [A]
time = 0.42, size = 18, normalized size = 0.75

$$\frac{1}{2}\,x+\frac{1}{2}\,\log\left(e^{x}+2\right)-\log\left(e^{x}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+3*exp(x)+exp(2*x)),x, algorithm="fricas")
[Out] 1/2*x + 1/2*log(e^x + 2) - log(e^x + 1)
```

Sympy [A]
time = 0.04, size = 17, normalized size = 0.71

$$\frac{x}{2}-\log\left(e^{x}+1\right)+\frac{\log\left(e^{x}+2\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+3*exp(x)+exp(2*x)),x)
[Out] x/2 - log(exp(x) + 1) + log(exp(x) + 2)/2
```

Giac [A]
time = 3.42, size = 18, normalized size = 0.75

$$\frac{1}{2}\,x+\frac{1}{2}\,\log\left(e^{x}+2\right)-\log\left(e^{x}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+3*exp(x)+exp(2*x)),x, algorithm="giac")
[Out] 1/2*x + 1/2*log(e^x + 2) - log(e^x + 1)
```

Mupad [B]
time = 0.07, size = 18, normalized size = 0.75

$$\frac{x}{2}-\ln\left(\mathrm{e}^{x}+1\right)+\frac{\ln\left(\mathrm{e}^{x}+2\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(exp(2*x) + 3*exp(x) + 2),x)
[Out] x/2 - log(exp(x) + 1) + log(exp(x) + 2)/2
```

3.507 $\int \frac{1}{-1+e^x+e^{2x}} dx$

Optimal. Leaf size=56

$$-x+\frac{1}{10}\left(5+\sqrt{5}\right)\log\left(1-\sqrt{5}+2e^x\right)+\frac{1}{10}\left(5-\sqrt{5}\right)\log\left(1+\sqrt{5}+2e^x\right)$$

```
[Out] -x+1/10*ln(1+2*exp(x)+5^(1/2))*(5-5^(1/2))+1/10*ln(1+2*exp(x)-5^(1/2))*(5+5
^(1/2))
```

Rubi [A]
time = 0.02, antiderivative size = 56, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.417$, Rules used = {2320, 719, 29, 646, 31}

$$-x+\frac{1}{10}\left(5+\sqrt{5}\right)\log\left(2e^x+1-\sqrt{5}\right)+\frac{1}{10}\left(5-\sqrt{5}\right)\log\left(2e^x+1+\sqrt{5}\right)$$

Antiderivative was successfully verified.

```
[In] Int[(-1 + E^x + E^(2*x))^(-1),x]
```

```
[Out] -x + ((5 + Sqrt[5])*Log[1 - Sqrt[5] + 2*E^x])/10 + ((5 - Sqrt[5])*Log[1 + S
qrt[5] + 2*E^x])/10
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 646

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> W
ith[{q = Rt[b^2 - 4*a*c, 2]}, Dist[(c*d - e*(b/2 - q/2))/q, Int[1/(b/2 - q/
2 + c*x), x], x] - Dist[(c*d - e*(b/2 + q/2))/q, Int[1/(b/2 + q/2 + c*x), x
], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[2*c*d - b*e, 0] && NeQ[b^2 - 4*a
*c, 0] && NiceSqrtQ[b^2 - 4*a*c]
```

Rule 719

```
Int[1/(((d_.) + (e_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)), x_Symbol]
 :> Dist[e^2/(c*d^2 - b*d*e + a*e^2), Int[1/(d + e*x), x], x] + Dist[1/(c*d
^2 - b*d*e + a*e^2), Int[(c*d - b*e - c*e*x)/(a + b*x + c*x^2), x], x] /; F
reeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^
```

```
2, 0] && NeQ[2*c*d - b*e, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{-1+e^x+e^{2x}}\,dx &= \text{Subst}\left(\int \frac{1}{x\,(-1+x+x^2)}\,dx, x, e^x\right)\\ &= -\text{Subst}\left(\int \frac{1}{x}\,dx, x, e^x\right)-\text{Subst}\left(\int \frac{-1-x}{-1+x+x^2}\,dx, x, e^x\right)\\ &= -x+\frac{1}{10}\left(5-\sqrt{5}\right)\text{Subst}\left(\int \frac{1}{\frac{1}{2}+\frac{\sqrt{5}}{2}+x}\,dx, x, e^x\right)+\frac{1}{10}\left(5+\sqrt{5}\right)\text{Subst}\left(\int\right.\\ &= -x+\frac{1}{10}\left(5+\sqrt{5}\right)\log\left(1-\sqrt{5}+2e^x\right)+\frac{1}{10}\left(5-\sqrt{5}\right)\log\left(1+\sqrt{5}+2e^x\right)\end{aligned}$$

Mathematica [A]
time = 0.07, size = 54, normalized size = 0.96

$$\frac{1}{10}\left(-10\log\left(e^x\right)+\left(5+\sqrt{5}\right)\log\left(-1+\sqrt{5}-2e^x\right)-\left(-5+\sqrt{5}\right)\log\left(1+\sqrt{5}+2e^x\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(-1 + E^x + E^(2*x))^(-1),x]
[Out] (-10*Log[E^x] + (5 + Sqrt[5])*Log[-1 + Sqrt[5] - 2*E^x] - (-5 + Sqrt[5])*Lo
g[1 + Sqrt[5] + 2*E^x])/10
```

Maple [A]
time = 0.02, size = 35, normalized size = 0.62

method	result	size
default	$\frac{\ln\left(-1+e^x+e^{2x}\right)}{2}-\frac{\sqrt{5}\,\operatorname{arctanh}\left(\frac{(1+2\,e^x)\sqrt{5}}{5}\right)}{5}-\ln\left(e^x\right)$	35

risch	$-x+\frac{\ln\left(e^{x}+\frac{1}{2}-\frac{\sqrt{5}}{2}\right)}{2}+\frac{\ln\left(e^{x}+\frac{1}{2}-\frac{\sqrt{5}}{2}\right)\sqrt{5}}{10}+\frac{\ln\left(e^{x}+\frac{1}{2}+\frac{\sqrt{5}}{2}\right)}{2}-\frac{\ln\left(e^{x}+\frac{1}{2}+\frac{\sqrt{5}}{2}\right)\sqrt{5}}{10}$	59

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-1+exp(x)+exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*ln(-1+exp(x)+exp(x)^2)-1/5*5^(1/2)*arctanh(1/5*(1+2*exp(x))*5^(1/2))-ln
(exp(x))
```

Maxima [A]
time = 0.48, size = 43, normalized size = 0.77

$$\frac{1}{10}\sqrt{5}\log\left(-\frac{\sqrt{5}-2e^{x}-1}{\sqrt{5}+2e^{x}+1}\right)-x+\frac{1}{2}\log\left(e^{(2x)}+e^{x}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-1+exp(x)+exp(2*x)),x, algorithm="maxima")
```

```
[Out] 1/10*sqrt(5)*log(-(sqrt(5) - 2*e^x - 1)/(sqrt(5) + 2*e^x + 1)) - x + 1/2*lo
g(e^(2*x) + e^x - 1)
```

Fricas [A]
time = 0.36, size = 53, normalized size = 0.95

$$\frac{1}{10}\sqrt{5}\log\left(-\frac{2\left(\sqrt{5}-1\right)e^{x}+\sqrt{5}-2e^{(2x)}-3}{e^{(2x)}+e^{x}-1}\right)-x+\frac{1}{2}\log\left(e^{(2x)}+e^{x}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-1+exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/10*sqrt(5)*log(-(2*(sqrt(5) - 1)*e^x + sqrt(5) - 2*e^(2*x) - 3)/(e^(2*x)
+ e^x - 1)) - x + 1/2*log(e^(2*x) + e^x - 1)
```

Sympy [A]
time = 0.04, size = 22, normalized size = 0.39

$$-x+\operatorname{RootSum}\left(5z^{2}-5z+1,\left(i\mapsto i\log\left(-5i+e^{x}+3\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-1+exp(x)+exp(2*x)),x)
```

```
[Out] -x + RootSum(5*_z**2 - 5*_z + 1, Lambda(_i, _i*log(-5*_i + exp(x) + 3)))
```

Giac [A]
time = 3.58, size = 46, normalized size = 0.82

$$\frac{1}{10}\sqrt{5}\log\left(\frac{\left|-\sqrt{5}+2e^{x}+1\right|}{\sqrt{5}+2e^{x}+1}\right)-x+\frac{1}{2}\log\left(\left|e^{(2x)}+e^{x}-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-1+exp(x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] 1/10*sqrt(5)*log(abs(-sqrt(5) + 2*e^x + 1)/(sqrt(5) + 2*e^x + 1)) - x + 1/2
*log(abs(e^(2*x) + e^x - 1))
```

Mupad [B]
time = 3.70, size = 32, normalized size = 0.57

$$\frac{\ln\left(e^{2x}+e^{x}-1\right)}{2}-x-\frac{\sqrt{5}\,\operatorname{atanh}\left(\frac{\sqrt{5}\,(2e^{x}+1)}{5}\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(exp(2*x) + exp(x) - 1),x)
```

```
[Out] log(exp(2*x) + exp(x) - 1)/2 - x - (5^(1/2)*atanh((5^(1/2)*(2*exp(x) + 1))/
5))/5
```

3.508 $\int \frac{1}{3+3e^x+e^{2x}}\,dx$

Optimal. Leaf size=44

$$\frac{x}{3}-\frac{\tan^{-1}\left(\frac{3+2e^x}{\sqrt{3}}\right)}{\sqrt{3}}-\frac{1}{6}\log\left(3+3e^x+e^{2x}\right)$$

```
[Out] 1/3*x-1/6*ln(3+3*exp(x)+exp(2*x))-1/3*arctan(1/3*(3+2*exp(x))*3^(1/2))*3^(1
/2)
```

Rubi [A]

time = 0.03, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {2320, 719, 29, 648, 632, 210, 642}

$$-\frac{\text{ArcTan}\left(\frac{2e^x+3}{\sqrt{3}}\right)}{\sqrt{3}}+\frac{x}{3}-\frac{1}{6}\log\left(3e^x+e^{2x}+3\right)$$

Antiderivative was successfully verified.

```
[In] Int[(3 + 3*E^x + E^(2*x))^(-1),x]
```

```
[Out] x/3 - ArcTan[(3 + 2*E^x)/Sqrt[3]]/Sqrt[3] - Log[3 + 3*E^x + E^(2*x)]/6
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

Rule 632

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 642

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[d*(Log[RemoveContent[a + b*x + c*x^2, x]]/b), x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 648

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 719

```
Int[1/(((d_.) + (e_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)), x_Symbol]
 :> Dist[e^2/(c*d^2 - b*d*e + a*e^2), Int[1/(d + e*x), x], x] + Dist[1/(c*d
^2 - b*d*e + a*e^2), Int[(c*d - b*e - c*e*x)/(a + b*x + c*x^2), x], x] /; F
reeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^
2, 0] && NeQ[2*c*d - b*e, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$
\begin{aligned}
\int \frac{1}{3+3e^x+e^{2x}}\,dx &= \text{Subst}\left(\int \frac{1}{x\left(3+3x+x^2\right)}\,dx, x, e^x\right)\\
&= \frac{1}{3}\text{Subst}\left(\int \frac{1}{x}\,dx, x, e^x\right)+\frac{1}{3}\text{Subst}\left(\int \frac{-3-x}{3+3x+x^2}\,dx, x, e^x\right)\\
&= \frac{x}{3}-\frac{1}{6}\text{Subst}\left(\int \frac{3+2x}{3+3x+x^2}\,dx, x, e^x\right)-\frac{1}{2}\text{Subst}\left(\int \frac{1}{3+3x+x^2}\,dx, x, e^x\right)\\
&= \frac{x}{3}-\frac{1}{6}\log\left(3+3e^x+e^{2x}\right)+\text{Subst}\left(\int \frac{1}{-3-x^2}\,dx, x, 3+2e^x\right)\\
&= \frac{x}{3}-\frac{\tan^{-1}\left(\frac{3+2e^x}{\sqrt{3}}\right)}{\sqrt{3}}-\frac{1}{6}\log\left(3+3e^x+e^{2x}\right)
\end{aligned}
$$

Mathematica [A]
time = 0.04, size = 47, normalized size = 1.07

$$
\frac{1}{6}\left(-2\sqrt{3}\,\tan^{-1}\left(\frac{3+2e^x}{\sqrt{3}}\right)+2\log\left(e^x\right)-\log\left(3+3e^x+e^{2x}\right)\right)
$$

Antiderivative was successfully verified.

```
[In] Integrate[(3 + 3*E^x + E^(2*x))^(-1),x]
```

```
[Out] (-2*Sqrt[3]*ArcTan[(3 + 2*E^x)/Sqrt[3]] + 2*Log[E^x] - Log[3 + 3*E^x + E^(2
*x)])/6
```

Maple [A]
time = 0.02, size = 37, normalized size = 0.84

method	result	size
default	$-\frac{\ln(3+3\,e^{x}+e^{2x})}{6}-\frac{\arctan\left(\frac{(3+2\,e^{x})\sqrt{3}}{3}\right)\sqrt{3}}{3}+\frac{\ln(e^{x})}{3}$	37
risch	$\frac{x}{3}-\frac{\ln\left(e^{x}+\frac{3}{2}-\frac{i\sqrt{3}}{2}\right)}{6}+\frac{i\ln\left(e^{x}+\frac{3}{2}-\frac{i\sqrt{3}}{2}\right)\sqrt{3}}{6}-\frac{\ln\left(e^{x}+\frac{3}{2}+\frac{i\sqrt{3}}{2}\right)}{6}-\frac{i\ln\left(e^{x}+\frac{3}{2}+\frac{i\sqrt{3}}{2}\right)\sqrt{3}}{6}$	65

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(3+3*exp(x)+exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/6*ln(3+3*exp(x)+exp(x)^2)-1/3*arctan(1/3*(3+2*exp(x))*3^(1/2))*3^(1/2)+1
/3*ln(exp(x))
```

Maxima [A]
time = 0.49, size = 34, normalized size = 0.77

$$-\frac{1}{3}\sqrt{3}\,\arctan\left(\frac{1}{3}\sqrt{3}\,(2\,e^{x}+3)\right)+\frac{1}{3}\,x-\frac{1}{6}\,\log\left(e^{(2\,x)}+3\,e^{x}+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(3+3*exp(x)+exp(2*x)),x, algorithm="maxima")
```

```
[Out] -1/3*sqrt(3)*arctan(1/3*sqrt(3)*(2*e^x + 3)) + 1/3*x - 1/6*log(e^(2*x) + 3*
e^x + 3)
```

Fricas [A]
time = 0.40, size = 34, normalized size = 0.77

$$-\frac{1}{3}\sqrt{3}\,\arctan\left(\frac{2}{3}\sqrt{3}\,e^{x}+\sqrt{3}\right)+\frac{1}{3}\,x-\frac{1}{6}\,\log\left(e^{(2\,x)}+3\,e^{x}+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(3+3*exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] -1/3*sqrt(3)*arctan(2/3*sqrt(3)*e^x + sqrt(3)) + 1/3*x - 1/6*log(e^(2*x) +
3*e^x + 3)
```

Sympy [A]
time = 0.04, size = 24, normalized size = 0.55

$$\frac{x}{3} + \operatorname{RootSum}\left(9z^2 + 3z + 1, \left(i \mapsto i \log\left(-3i + e^x + 1\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(3+3*exp(x)+exp(2*x)),x)
```

```
[Out] x/3 + RootSum(9*_z**2 + 3*_z + 1, Lambda(_i, _i*log(-3*_i + exp(x) + 1)))
```

Giac [A]
time = 4.30, size = 34, normalized size = 0.77

$$-\frac{1}{3}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}\left(2e^x + 3\right)\right) + \frac{1}{3}x - \frac{1}{6}\log\left(e^{(2x)} + 3e^x + 3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(3+3*exp(x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] -1/3*sqrt(3)*arctan(1/3*sqrt(3)*(2*e^x + 3)) + 1/3*x - 1/6*log(e^(2*x) + 3*
e^x + 3)
```

Mupad [B]
time = 3.52, size = 34, normalized size = 0.77

$$\frac{x}{3} - \frac{\ln\left(e^{2x} + 3e^x + 3\right)}{6} - \frac{\sqrt{3}\operatorname{atan}\left(\sqrt{3} + \frac{2\sqrt{3}e^x}{3}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(exp(2*x) + 3*exp(x) + 3),x)
```

```
[Out] x/3 - log(exp(2*x) + 3*exp(x) + 3)/6 - (3^(1/2)*atan(3^(1/2) + (2*3^(1/2)*e
xp(x))/3))/3
```

3.509 $\int \frac{1}{a+be^x+ce^{2x}}\,dx$

Optimal. Leaf size=67

$$\frac{x}{a}+\frac{b\tanh^{-1}\left(\frac{b+2ce^x}{\sqrt{b^2-4ac}}\right)}{a\sqrt{b^2-4ac}}-\frac{\log\left(a+be^x+ce^{2x}\right)}{2a}$$

```
[Out] x/a-1/2*ln(a+b*exp(x)+c*exp(2*x))/a+b*arctanh((b+2*c*exp(x))/(-4*a*c+b^2)^(
1/2))/a/(-4*a*c+b^2)^(1/2)
```

Rubi [A]
time = 0.05, antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.438$, Rules used = {2320, 719, 29, 648, 632, 212, 642}

$$\frac{b\tanh^{-1}\left(\frac{b+2ce^x}{\sqrt{b^2-4ac}}\right)}{a\sqrt{b^2-4ac}}-\frac{\log\left(a+be^x+ce^{2x}\right)}{2a}+\frac{x}{a}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*E^x + c*E^(2*x))^(-1),x]
```

```
[Out] x/a + (b*ArcTanh[(b + 2*c*E^x)/Sqrt[b^2 - 4*a*c]])/(a*Sqrt[b^2 - 4*a*c]) -
Log[a + b*E^x + c*E^(2*x)]/(2*a)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 632

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 642

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[d*(Log[RemoveContent[a + b*x + c*x^2, x]]/b), x] /; FreeQ[{a, b, c, d,
```

```
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 648

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 719

```
Int[1/(((d_.) + (e_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)), x_Symbol]
 :> Dist[e^2/(c*d^2 - b*d*e + a*e^2), Int[1/(d + e*x), x], x] + Dist[1/(c*d
^2 - b*d*e + a*e^2), Int[(c*d - b*e - c*e*x)/(a + b*x + c*x^2), x], x] /; F
reeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^
2, 0] && NeQ[2*c*d - b*e, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{a+be^x+ce^{2x}}\,dx &= \text{Subst}\left(\int \frac{1}{x\left(a+bx+cx^2\right)}\,dx,x,e^x\right)\\
&= \frac{\text{Subst}\left(\int \frac{1}{x}\,dx,x,e^x\right)}{a}+\frac{\text{Subst}\left(\int \frac{-b-cx}{a+bx+cx^2}\,dx,x,e^x\right)}{a}\\
&= \frac{x}{a}-\frac{\text{Subst}\left(\int \frac{b+2cx}{a+bx+cx^2}\,dx,x,e^x\right)}{2a}-\frac{b\text{Subst}\left(\int \frac{1}{a+bx+cx^2}\,dx,x,e^x\right)}{2a}\\
&= \frac{x}{a}-\frac{\log\left(a+be^x+ce^{2x}\right)}{2a}+\frac{b\text{Subst}\left(\int \frac{1}{b^2-4ac-x^2}\,dx,x,b+2ce^x\right)}{a}\\
&= \frac{x}{a}+\frac{b\tanh^{-1}\left(\frac{b+2ce^x}{\sqrt{b^2-4ac}}\right)}{a\sqrt{b^2-4ac}}-\frac{\log\left(a+be^x+ce^{2x}\right)}{2a}
\end{aligned}$$

Mathematica [A]

time = 0.13, size = 69, normalized size = 1.03

$$-\frac{\frac{2b\tan^{-1}\left(\frac{b+2ce^x}{\sqrt{-b^2+4ac}}\right)}{\sqrt{-b^2+4ac}}-2\log\left(e^x\right)+\log\left(a+e^x(b+ce^x)\right)}{2a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*E^x + c*E^(2*x))^(-1),x]
```

```
[Out] -1/2*((2*b*ArcTan[(b + 2*c*E^x)/Sqrt[-b^2 + 4*a*c]])/Sqrt[-b^2 + 4*a*c] - 2
*Log[E^x] + Log[a + E^x*(b + c*E^x)])/a
```

Maple [A]
time = 0.09, size = 65, normalized size = 0.97

method	result
default	$\frac{\ln(\mathrm{e}^x)}{a}+\frac{-\frac{\ln\left(a+b\,\mathrm{e}^x+c\,\mathrm{e}^{2x}\right)}{2}-\frac{b\arctan\left(\frac{b+2c\,\mathrm{e}^x}{\sqrt{4ca-b^2}}\right)}{\sqrt{4ca-b^2}}}{a}$
risch	$\frac{4xca}{4a^2c-b^2a}-\frac{x\,b^2}{4a^2c-b^2a}-\frac{2\ln\left(\mathrm{e}^x-\frac{-b^2+\sqrt{-4a\,b^2c+b^4}}{2cb}\right)c}{4ca-b^2}+\frac{\ln\left(\mathrm{e}^x-\frac{-b^2+\sqrt{-4a\,b^2c+b^4}}{2cb}\right)b^2}{2a(4ca-b^2)}+\frac{\ln\left(\mathrm{e}^x-\frac{-b^2+\sqrt{}}{}\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*exp(x)+c*exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/a*ln(exp(x))+1/a*(-1/2*ln(a+b*exp(x)+c*exp(x)^2)-b/(4*a*c-b^2)^(1/2)*arct
an((b+2*c*exp(x))/(4*a*c-b^2)^(1/2)))
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*exp(x)+c*exp(2*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re deta
```

Fricas [A]
time = 0.41, size = 219, normalized size = 3.27

$$\left[\frac{\sqrt{b^2-4\,ac}\,b\log\left(\frac{2\,c^2e^{(2\,x)}+2\,bce^x+b^2-2\,ac+\sqrt{b^2-4\,ac}\,(2\,ce^x+b)}{ce^{(2\,x)}+be^x+a}\right)+2\,(b^2-4\,ac)x-(b^2-4\,ac)\log\left(ce^{(2\,x)}+be^x+a\right)}{2\,(ab^2-4\,a^2c)},\ \frac{2\sqrt{-b^2+4\,ac}\,b\arctan\left(-\frac{\sqrt{-b^2+4\,ac}\,(2\,ce^x+b)}{b^2-4\,ac}\right)+2\,(b^2-4\,ac)x-(b^2-4\,ac)\log\left(ce^{(2\,x)}+be^x+a\right)}{2\,(ab^2-4\,a^2c)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*exp(x)+c*exp(2*x)),x, algorithm="fricas")
```

```
[Out] [1/2*(sqrt(b^2 - 4*a*c)*b*log((2*c^2*e^(2*x) + 2*b*c*e^x + b^2 - 2*a*c + sq
rt(b^2 - 4*a*c)*(2*c*e^x + b))/(c*e^(2*x) + b*e^x + a)) + 2*(b^2 - 4*a*c)*x
 - (b^2 - 4*a*c)*log(c*e^(2*x) + b*e^x + a))/(a*b^2 - 4*a^2*c), 1/2*(2*sqrt
(-b^2 + 4*a*c)*b*arctan(-sqrt(-b^2 + 4*a*c)*(2*c*e^x + b)/(b^2 - 4*a*c)) +
2*(b^2 - 4*a*c)*x - (b^2 - 4*a*c)*log(c*e^(2*x) + b*e^x + a))/(a*b^2 - 4*a^
2*c)]
```

Sympy [A]
time = 0.16, size = 63, normalized size = 0.94

$$\text{RootSum}\left(z^2\cdot\left(4a^2c-ab^2\right)+z\left(4ac-b^2\right)+c,\left(i\mapsto i\log\left(e^x+\frac{-4ia^2c+iab^2-2ac+b^2}{bc}\right)\right)\right)+\frac{x}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*exp(x)+c*exp(2*x)),x)
```

```
[Out] RootSum(_z**2*(4*a**2*c - a*b**2) + _z*(4*a*c - b**2) + c, Lambda(_i, _i*lo
g(exp(x) + (-4*_i*a**2*c + _i*a*b**2 - 2*a*c + b**2)/(b*c)))) + x/a
```

Giac [A]
time = 3.95, size = 63, normalized size = 0.94

$$-\frac{b\arctan\left(\frac{2\,ce^x+b}{\sqrt{-b^2+4\,ac}}\right)}{\sqrt{-b^2+4\,ac}\,a}+\frac{x}{a}-\frac{\log\left(ce^{(2\,x)}+be^x+a\right)}{2\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*exp(x)+c*exp(2*x)),x, algorithm="giac")
```

```
[Out] -b*arctan((2*c*e^x + b)/sqrt(-b^2 + 4*a*c))/(sqrt(-b^2 + 4*a*c)*a) + x/a -
1/2*log(c*e^(2*x) + b*e^x + a)/a
```

Mupad [B]
time = 0.23, size = 63, normalized size = 0.94

$$\frac{x}{a}-\frac{\ln\left(a+b\,\mathrm{e}^x+c\,\mathrm{e}^{2\,x}\right)}{2\,a}-\frac{b\,\mathrm{atan}\left(\frac{b+2\,c\,\mathrm{e}^x}{\sqrt{4\,a\,c-b^2}}\right)}{a\,\sqrt{4\,a\,c-b^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a + b*exp(x) + c*exp(2*x)),x)
```

```
[Out] x/a - log(a + b*exp(x) + c*exp(2*x))/(2*a) - (b*atan((b + 2*c*exp(x))/(4*a*
c - b^2)^(1/2)))/(a*(4*a*c - b^2)^(1/2))
```

3.510 $\int \frac{x}{1+2e^x+e^{2x}}\,dx$

Optimal. Leaf size=44

$$-x+\frac{x}{1+e^x}+\frac{x^2}{2}+\log\left(1+e^x\right)-x\log\left(1+e^x\right)-\text{Li}_2\left(-e^x\right)$$

```
[Out] -x+x/(1+exp(x))+1/2*x^2+ln(1+exp(x))-x*ln(1+exp(x))-polylog(2,-exp(x))
```

Rubi [A]
time = 0.09, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 11, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.688, Rules used = {6820, 2216, 2215, 2221, 2317, 2438, 2222, 2320, 36, 29, 31}

$$-\text{PolyLog}(2,-e^x)+\frac{x^2}{2}+\frac{x}{e^x+1}-x-x\log\left(e^x+1\right)+\log\left(e^x+1\right)$$

Antiderivative was successfully verified.

```
[In] Int[x/(1 + 2*E^x + E^(2*x)),x]
```

```
[Out] -x + x/(1 + E^x) + x^2/2 + Log[1 + E^x] - x*Log[1 + E^x] - PolyLog[2, -E^x]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 2215

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[(c + d*x)^m*((F^(g*(e + f*x)))^n/(a + b*(F^(g*(e + f*x)))^n)), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2216

```
Int[((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.))^(p_)*((c_.) +
(d_.)*(x_))^(m_.), x_Symbol] :> Dist[1/a, Int[(c + d*x)^m*(a + b*(F^(g*(e +
```

```
 f*x)))^n)^(p + 1), x], x] - Dist[b/a, Int[(c + d*x)^m*(F^(g*(e + f*x)))^n*
(a + b*(F^(g*(e + f*x)))^n)^p, x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n},
 x] && ILtQ[p, 0] && IGtQ[m, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2222

```
Int[((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((a_.) + (b_.)*((F_)^((g_.)*(
(e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :>
 Simp[(c + d*x)^m*((a + b*(F^(g*(e + f*x)))^n)^(p + 1)/(b*f*g*n*(p + 1)*Log
[F])), x] - Dist[d*(m/(b*f*g*n*(p + 1)*Log[F])), Int[(c + d*x)^(m - 1)*(a +
 b*(F^(g*(e + f*x)))^n)^(p + 1), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m
, n, p}, x] && NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6820

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rubi steps

$$\begin{aligned}\int \frac{x}{1+2e^x+e^{2x}}\,dx &= \int \frac{x}{(1+e^x)^2}\,dx\\ &= -\int \frac{e^x x}{(1+e^x)^2}\,dx+\int \frac{x}{1+e^x}\,dx\\ &= \frac{x}{1+e^x}+\frac{x^2}{2}-\int \frac{1}{1+e^x}\,dx-\int \frac{e^x x}{1+e^x}\,dx\\ &= \frac{x}{1+e^x}+\frac{x^2}{2}-x\log(1+e^x)+\int \log(1+e^x)\,dx-\text{Subst}\left(\int \frac{1}{x(1+x)}\,dx,x,e^x\right)\\ &= \frac{x}{1+e^x}+\frac{x^2}{2}-x\log(1+e^x)-\text{Subst}\left(\int \frac{1}{x}\,dx,x,e^x\right)+\text{Subst}\left(\int \frac{1}{1+x}\,dx,x,e^x\right)+\\ &= -x+\frac{x}{1+e^x}+\frac{x^2}{2}+\log(1+e^x)-x\log(1+e^x)-\text{Li}_2(-e^x)\end{aligned}$$

Mathematica [A]
time = 0.05, size = 38, normalized size = 0.86

$$\frac{1}{2}x\left(-2+\frac{2}{1+e^x}+x\right)-(-1+x)\log(1+e^x)-\text{Li}_2(-e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(1 + 2*E^x + E^(2*x)),x]
[Out] (x*(-2 + 2/(1 + E^x) + x))/2 - (-1 + x)*Log[1 + E^x] - PolyLog[2, -E^x]
```

Maple [A]
time = 0.02, size = 38, normalized size = 0.86

method	result	size
default	$\ln(1+e^x)-\frac{x e^x}{1+e^x}-\text{dilog}(1+e^x)-x\ln(1+e^x)+\frac{x^2}{2}$	38
risch	$\frac{x}{1+e^x}+\frac{x^2}{2}-x\ln(1+e^x)-\text{polylog}(2,-e^x)-\ln(e^x)+\ln(1+e^x)$	41

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(1+2*exp(x)+exp(2*x)),x,method=_RETURNVERBOSE)
[Out] ln(1+exp(x))-x*exp(x)/(1+exp(x))-dilog(1+exp(x))-x*ln(1+exp(x))+1/2*x^2
```

Maxima [A]
time = 0.28, size = 37, normalized size = 0.84

$$\frac{1}{2}x^2-x\log(e^x+1)-x+\frac{x}{e^x+1}-\text{Li}_2(-e^x)+\log(e^x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(1+2*exp(x)+exp(2*x)),x, algorithm="maxima")
[Out] 1/2*x^2 - x*log(e^x + 1) - x + x/(e^x + 1) - dilog(-e^x) + log(e^x + 1)
```

Fricas [A]
time = 0.38, size = 49, normalized size = 1.11

$$\frac{x^2 - 2\,(e^x + 1)\mathrm{Li}_2(-e^x) + (x^2 - 2\,x)e^x - 2\,((x - 1)e^x + x - 1)\log{(e^x + 1)}}{2\,(e^x + 1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(1+2*exp(x)+exp(2*x)),x, algorithm="fricas")
[Out] 1/2*(x^2 - 2*(e^x + 1)*dilog(-e^x) + (x^2 - 2*x)*e^x - 2*((x - 1)*e^x + x -
 1)*log(e^x + 1))/(e^x + 1)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{x}{e^x + 1} + \int \frac{x - 1}{e^x + 1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(1+2*exp(x)+exp(2*x)),x)
[Out] x/(exp(x) + 1) + Integral((x - 1)/(exp(x) + 1), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(1+2*exp(x)+exp(2*x)),x, algorithm="giac")
[Out] integrate(x/(e^(2*x) + 2*e^x + 1), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x}{\mathrm{e}^{2\,x} + 2\,\mathrm{e}^x + 1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(exp(2*x) + 2*exp(x) + 1),x)
[Out] int(x/(exp(2*x) + 2*exp(x) + 1), x)
```

3.511 $\int \frac{x}{2+3e^x+e^{2x}}\,dx$

Optimal. Leaf size=54

$$\frac{x^2}{4}+\frac{1}{2}x\log\left(1+\frac{e^x}{2}\right)-x\log\left(1+e^x\right)-\text{Li}_2(-e^x)+\frac{1}{2}\text{Li}_2\left(-\frac{e^x}{2}\right)$$

```
[Out] 1/4*x^2+1/2*x*ln(1+1/2*exp(x))-x*ln(1+exp(x))-polylog(2,-exp(x))+1/2*polylo
g(2,-1/2*exp(x))
```

Rubi [A]
time = 0.08, antiderivative size = 54, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.312$, Rules used = {2295, 2215, 2221, 2317, 2438}

$$-\text{PolyLog}(2,-e^x)+\frac{1}{2}\text{PolyLog}\left(2,-\frac{e^x}{2}\right)+\frac{x^2}{4}+\frac{1}{2}x\log\left(\frac{e^x}{2}+1\right)-x\log\left(e^x+1\right)$$

Antiderivative was successfully verified.

```
[In] Int[x/(2 + 3*E^x + E^(2*x)),x]
```

```
[Out] x^2/4 + (x*Log[1 + E^x/2])/2 - x*Log[1 + E^x] - PolyLog[2, -E^x] + PolyLog[
2, -1/2*E^x]/2
```

Rule 2215

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[(c + d*x)^m*((F^(g*(e + f*x)))^n/(a + b*(F^(g*(e + f*x)))^n)), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2295

```
Int[((f_.) + (g_.)*(x_))^(m_.)/((a_.) + (b_.)*(F_)^(u_) + (c_.)*(F_)^(v_)),
 x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[(f + g*x)^m/
(b - q + 2*c*F^u), x], x] - Dist[2*(c/q), Int[(f + g*x)^m/(b + q + 2*c*F^u)
, x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v, 2*u] && LinearQ[u, x] &
& NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{x}{2+3e^x+e^{2x}}\,dx &= 2\int \frac{x}{2+2e^x}\,dx-2\int \frac{x}{4+2e^x}\,dx\\ &= \frac{x^2}{4}-2\int \frac{e^x x}{2+2e^x}\,dx+\int \frac{e^x x}{4+2e^x}\,dx\\ &= \frac{x^2}{4}+\frac{1}{2}x\log\left(1+\frac{e^x}{2}\right)-x\log\left(1+e^x\right)-\frac{1}{2}\int \log\left(1+\frac{e^x}{2}\right)\,dx+\int \log\left(1+e^x\right)\,dx\\ &= \frac{x^2}{4}+\frac{1}{2}x\log\left(1+\frac{e^x}{2}\right)-x\log\left(1+e^x\right)-\frac{1}{2}\text{Subst}\left(\int \frac{\log\left(1+\frac{x}{2}\right)}{x}\,dx,x,e^x\right)+\text{Subst}\\ &= \frac{x^2}{4}+\frac{1}{2}x\log\left(1+\frac{e^x}{2}\right)-x\log\left(1+e^x\right)-\text{Li}_2(-e^x)+\frac{1}{2}\text{Li}_2\left(-\frac{e^x}{2}\right)\end{aligned}$$

Mathematica [A]
time = 0.05, size = 49, normalized size = 0.91

$$-x\log\left(1+e^{-x}\right)+\frac{1}{2}x\log\left(1+2e^{-x}\right)-\frac{1}{2}\text{Li}_2\left(-2e^{-x}\right)+\text{Li}_2\left(-e^{-x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(2 + 3*E^x + E^(2*x)),x]
[Out] -(x*Log[1 + E^(-x)]) + (x*Log[1 + 2/E^x])/2 - PolyLog[2, -2/E^x]/2 + PolyLo
g[2, -E^(-x)]
```

Maple [A]
time = 0.03, size = 41, normalized size = 0.76

method	result	size
default	$\frac{x^2}{4}+\frac{x\ln\left(1+\frac{e^x}{2}\right)}{2}-x\ln\left(1+e^x\right)-\text{polylog}\left(2,-e^x\right)+\frac{\text{polylog}\left(2,-\frac{e^x}{2}\right)}{2}$	41

risch	$\frac{x^2}{4}+\frac{x\ln\left(1+\frac{e^x}{2}\right)}{2}-x\ln\left(1+e^x\right)-\operatorname{polylog}\left(2,-e^x\right)+\frac{\operatorname{polylog}\left(2,-\frac{e^x}{2}\right)}{2}$	41

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(2+3*exp(x)+exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/4*x^2+1/2*x*ln(1+1/2*exp(x))-x*ln(1+exp(x))-polylog(2,-exp(x))+1/2*polylo
g(2,-1/2*exp(x))
```

Maxima [A]
time = 0.28, size = 38, normalized size = 0.70

$$\frac{1}{4}x^2-x\log\left(e^x+1\right)+\frac{1}{2}x\log\left(\frac{1}{2}e^x+1\right)+\frac{1}{2}\operatorname{Li}_2\left(-\frac{1}{2}e^x\right)-\operatorname{Li}_2(-e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(2+3*exp(x)+exp(2*x)),x, algorithm="maxima")
```

```
[Out] 1/4*x^2 - x*log(e^x + 1) + 1/2*x*log(1/2*e^x + 1) + 1/2*dilog(-1/2*e^x) - d
ilog(-e^x)
```

Fricas [A]
time = 0.39, size = 38, normalized size = 0.70

$$\frac{1}{4}x^2-x\log\left(e^x+1\right)+\frac{1}{2}x\log\left(\frac{1}{2}e^x+1\right)+\frac{1}{2}\operatorname{Li}_2\left(-\frac{1}{2}e^x\right)-\operatorname{Li}_2(-e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(2+3*exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/4*x^2 - x*log(e^x + 1) + 1/2*x*log(1/2*e^x + 1) + 1/2*dilog(-1/2*e^x) - d
ilog(-e^x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{x}{\left(e^x+1\right)\left(e^x+2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(2+3*exp(x)+exp(2*x)),x)
```

```
[Out] Integral(x/((exp(x) + 1)*(exp(x) + 2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(2+3*exp(x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] integrate(x/(e^(2*x) + 3*e^x + 2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x}{e^{2x} + 3e^{x} + 2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(exp(2*x) + 3*exp(x) + 2),x)
```

```
[Out] int(x/(exp(2*x) + 3*exp(x) + 2), x)
```

3.512 $\int \frac{x}{-1+e^x+e^{2x}}\,dx$

Optimal. Leaf size=180

$$\frac{x^2}{\sqrt{5}\left(1-\sqrt{5}\right)}-\frac{x^2}{\sqrt{5}\left(1+\sqrt{5}\right)}-\frac{2x\log\left(1+\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)}+\frac{2x\log\left(1+\frac{2e^x}{1+\sqrt{5}}\right)}{\sqrt{5}\left(1+\sqrt{5}\right)}-\frac{2\text{Li}_2\left(-\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)}+\frac{2\text{Li}_2\left(-\right.}{\sqrt{5}\left(1\right.}$$

```
[Out] 1/5*x^2/(-5^(1/2)+1)*5^(1/2)-2/5*x*ln(1+2*exp(x)/(-5^(1/2)+1))/(-5^(1/2)+1)
*5^(1/2)-2/5*polylog(2,-2*exp(x)/(-5^(1/2)+1))/(-5^(1/2)+1)*5^(1/2)-1/5*x^2
*5^(1/2)/(5^(1/2)+1)+2/5*x*ln(1+2*exp(x)/(5^(1/2)+1))*5^(1/2)/(5^(1/2)+1)+2
/5*polylog(2,-2*exp(x)/(5^(1/2)+1))*5^(1/2)/(5^(1/2)+1)
```

Rubi [A]
time = 0.13, antiderivative size = 180, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.357$, Rules used = {2295, 2215, 2221, 2317, 2438}

$$-\frac{2\text{PolyLog}\left(2,-\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)}+\frac{2\text{PolyLog}\left(2,-\frac{2e^x}{1+\sqrt{5}}\right)}{\sqrt{5}\left(1+\sqrt{5}\right)}-\frac{x^2}{\sqrt{5}\left(1+\sqrt{5}\right)}+\frac{x^2}{\sqrt{5}\left(1-\sqrt{5}\right)}-\frac{2x\log\left(\frac{2e^x}{1-\sqrt{5}}+1\right)}{\sqrt{5}\left(1-\sqrt{5}\right)}+\frac{2x\log\left(\frac{2e^x}{1+\sqrt{5}}+1\right)}{\sqrt{5}\left(1+\sqrt{5}\right)}$$

Antiderivative was successfully verified.

```
[In] Int[x/(-1 + E^x + E^(2*x)),x]
```

```
[Out] x^2/(Sqrt[5]*(1 - Sqrt[5])) - x^2/(Sqrt[5]*(1 + Sqrt[5])) - (2*x*Log[1 + (2
*E^x)/(1 - Sqrt[5])])/(Sqrt[5]*(1 - Sqrt[5])) + (2*x*Log[1 + (2*E^x)/(1 + S
qrt[5])])/(Sqrt[5]*(1 + Sqrt[5])) - (2*PolyLog[2, (-2*E^x)/(1 - Sqrt[5])])/
(Sqrt[5]*(1 - Sqrt[5])) + (2*PolyLog[2, (-2*E^x)/(1 + Sqrt[5])])/(Sqrt[5]*(
1 + Sqrt[5]))
```

Rule 2215

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[(c + d*x)^m*((F^(g*(e + f*x)))^n/(a + b*(F^(g*(e + f*x)))^n)), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2295

```
Int[((f_.) + (g_.)*(x_))^(m_.)/((a_.) + (b_.)*(F_)^(u_) + (c_.)*(F_)^(v_)),
 x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[(f + g*x)^m/
(b - q + 2*c*F^u), x], x] - Dist[2*(c/q), Int[(f + g*x)^m/(b + q + 2*c*F^u)
, x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v, 2*u] && LinearQ[u, x] &
& NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{x}{-1+e^x+e^{2x}}\,dx &= \frac{2\int \frac{x}{1-\sqrt{5}+2e^x}\,dx}{\sqrt{5}}-\frac{2\int \frac{x}{1+\sqrt{5}+2e^x}\,dx}{\sqrt{5}}\\
&= \frac{x^2}{\sqrt{5}\left(1-\sqrt{5}\right)}-\frac{x^2}{\sqrt{5}\left(1+\sqrt{5}\right)}-\frac{4\int \frac{e^x x}{1-\sqrt{5}+2e^x}\,dx}{\sqrt{5}\left(1-\sqrt{5}\right)}+\frac{4\int \frac{e^x x}{1+\sqrt{5}+2e^x}\,dx}{\sqrt{5}\left(1+\sqrt{5}\right)}\\
&= \frac{x^2}{\sqrt{5}\left(1-\sqrt{5}\right)}-\frac{x^2}{\sqrt{5}\left(1+\sqrt{5}\right)}-\frac{2x\log\left(1+\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)}+\frac{2x\log\left(1+\frac{2e^x}{1+\sqrt{5}}\right)}{\sqrt{5}\left(1+\sqrt{5}\right)}\\
&= \frac{x^2}{\sqrt{5}\left(1-\sqrt{5}\right)}-\frac{x^2}{\sqrt{5}\left(1+\sqrt{5}\right)}-\frac{2x\log\left(1+\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)}+\frac{2x\log\left(1+\frac{2e^x}{1+\sqrt{5}}\right)}{\sqrt{5}\left(1+\sqrt{5}\right)}\\
&= \frac{x^2}{\sqrt{5}\left(1-\sqrt{5}\right)}-\frac{x^2}{\sqrt{5}\left(1+\sqrt{5}\right)}-\frac{2x\log\left(1+\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)}+\frac{2x\log\left(1+\frac{2e^x}{1+\sqrt{5}}\right)}{\sqrt{5}\left(1+\sqrt{5}\right)}
\end{aligned}$$

Mathematica [A]

time = 0.08, size = 120, normalized size = 0.67

$$\frac{\left(1+\sqrt{5}\right)x\log\left(1-\frac{1}{2}\left(-1+\sqrt{5}\right)e^{-x}\right)+\left(-1+\sqrt{5}\right)x\log\left(1+\frac{1}{2}\left(1+\sqrt{5}\right)e^{-x}\right)-\left(1+\sqrt{5}\right)\text{Li}_2\left(\frac{1}{2}\left(-1+\sqrt{5}\right)e^{-x}\right)-\left(-1+\sqrt{5}\right)\text{Li}_2\left(-\frac{1}{2}\left(1+\sqrt{5}\right)e^{-x}\right)}{2\sqrt{5}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(-1 + E^x + E^(2*x)),x]
```

```
[Out] ((1 + Sqrt[5])*x*Log[1 - (-1 + Sqrt[5])/(2*E^x)] + (-1 + Sqrt[5])*x*Log[1 +
 (1 + Sqrt[5])/(2*E^x)] - (1 + Sqrt[5])*PolyLog[2, (-1 + Sqrt[5])/(2*E^x)]
- (-1 + Sqrt[5])*PolyLog[2, -1/2*(1 + Sqrt[5])/E^x])/(2*Sqrt[5])
```

Maple [A]
time = 0.02, size = 183, normalized size = 1.02

method	result
default	$\frac{\sqrt{5}\,x\ln\left(\frac{\sqrt{5}-1-2\,\mathrm{e}^{x}}{\sqrt{5}-1}\right)}{10}+\frac{x\ln\left(\frac{\sqrt{5}-1-2\,\mathrm{e}^{x}}{\sqrt{5}-1}\right)}{2}-\frac{\sqrt{5}\,x\ln\left(\frac{1+2\,\mathrm{e}^{x}+\sqrt{5}}{\sqrt{5}+1}\right)}{10}+\frac{x\ln\left(\frac{1+2\,\mathrm{e}^{x}+\sqrt{5}}{\sqrt{5}+1}\right)}{2}+\frac{\sqrt{5}\,\mathrm{dilog}\left(\sqrt{5}\right.}{10}$
risch	$\frac{\sqrt{5}\,x\ln\left(\frac{\sqrt{5}-1-2\,\mathrm{e}^{x}}{\sqrt{5}-1}\right)}{10}+\frac{x\ln\left(\frac{\sqrt{5}-1-2\,\mathrm{e}^{x}}{\sqrt{5}-1}\right)}{2}-\frac{\sqrt{5}\,x\ln\left(\frac{1+2\,\mathrm{e}^{x}+\sqrt{5}}{\sqrt{5}+1}\right)}{10}+\frac{x\ln\left(\frac{1+2\,\mathrm{e}^{x}+\sqrt{5}}{\sqrt{5}+1}\right)}{2}+\frac{\sqrt{5}\,\mathrm{dilog}\left(\sqrt{5}\right.}{10}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(-1+exp(x)+exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/10*5^(1/2)*x*ln((5^(1/2)-1-2*exp(x))/(5^(1/2)-1))+1/2*x*ln((5^(1/2)-1-2*e
xp(x))/(5^(1/2)-1))-1/10*5^(1/2)*x*ln((1+2*exp(x)+5^(1/2))/(5^(1/2)+1))+1/2
*x*ln((1+2*exp(x)+5^(1/2))/(5^(1/2)+1))+1/10*5^(1/2)*dilog((5^(1/2)-1-2*exp
(x))/(5^(1/2)-1))+1/2*dilog((5^(1/2)-1-2*exp(x))/(5^(1/2)-1))-1/10*5^(1/2)*
dilog((1+2*exp(x)+5^(1/2))/(5^(1/2)+1))+1/2*dilog((1+2*exp(x)+5^(1/2))/(5^(
1/2)+1))-1/2*x^2
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-1+exp(x)+exp(2*x)),x, algorithm="maxima")
```

```
[Out] integrate(x/(e^(2*x) + e^x - 1), x)
```

Fricas [A]
time = 0.37, size = 86, normalized size = 0.48

$$-\frac{1}{2}\,x^{2}+\frac{1}{10}\left(\sqrt{5}+5\right)\text{Li}_2\left(\frac{1}{2}\left(\sqrt{5}+1\right)e^{x}\right)-\frac{1}{10}\left(\sqrt{5}-5\right)\text{Li}_2\left(-\frac{1}{2}\left(\sqrt{5}-1\right)e^{x}\right)+\frac{1}{10}\left(\sqrt{5}\,x+5\,x\right)\log\left(-\frac{1}{2}\left(\sqrt{5}+1\right)e^{x}+1\right)-\frac{1}{10}\left(\sqrt{5}\,x-5\,x\right)\log\left(\frac{1}{2}\left(\sqrt{5}-1\right)e^{x}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-1+exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] -1/2*x^2 + 1/10*(sqrt(5) + 5)*dilog(1/2*(sqrt(5) + 1)*e^x) - 1/10*(sqrt(5)
- 5)*dilog(-1/2*(sqrt(5) - 1)*e^x) + 1/10*(sqrt(5)*x + 5*x)*log(-1/2*(sqrt(
5) + 1)*e^x + 1) - 1/10*(sqrt(5)*x - 5*x)*log(1/2*(sqrt(5) - 1)*e^x + 1)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{e^{2x} + e^{x} - 1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-1+exp(x)+exp(2*x)),x)
```

```
[Out] Integral(x/(exp(2*x) + exp(x) - 1), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-1+exp(x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] integrate(x/(e^(2*x) + e^x - 1), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x}{\mathrm{e}^{2\,x} + \mathrm{e}^{x} - 1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(exp(2*x) + exp(x) - 1),x)
```

```
[Out] int(x/(exp(2*x) + exp(x) - 1), x)
```

3.513 $\int \frac{x}{3+3e^x+e^{2x}}\,dx$

Optimal. Leaf size=204

$$-\frac{x^2}{\sqrt{3}\left(3i-\sqrt{3}\right)}+\frac{x^2}{\sqrt{3}\left(3i+\sqrt{3}\right)}-\frac{2x\log\left(1+\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(3i+\sqrt{3}\right)}+\frac{2x\log\left(1+\frac{2e^x}{3+i\sqrt{3}}\right)}{\sqrt{3}\left(3i-\sqrt{3}\right)}-\frac{2\text{Li}_2\left(-\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(3i+\sqrt{3}\right)}+\frac{2\text{L}}{\sqrt{}}$$

```
[Out] -1/3*x^2/(3*I-3^(1/2))*3^(1/2)+2/3*x*ln(1+2*exp(x)/(3+I*3^(1/2)))/(3*I-3^(1
/2))*3^(1/2)+2/3*polylog(2,-2*exp(x)/(3+I*3^(1/2)))/(3*I-3^(1/2))*3^(1/2)+1
/3*x^2*3^(1/2)/(3*I+3^(1/2))-2/3*x*ln(1+2*exp(x)/(3-I*3^(1/2)))*3^(1/2)/(3*
I+3^(1/2))-2/3*polylog(2,-2*exp(x)/(3-I*3^(1/2)))*3^(1/2)/(3*I+3^(1/2))
```

Rubi [A]
time = 0.14, antiderivative size = 204, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.312$, Rules used = {2295, 2215, 2221, 2317, 2438}

$$-\frac{2\text{PolyLog}\left(2,-\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(\sqrt{3}+3i\right)}+\frac{2\text{PolyLog}\left(2,-\frac{2e^x}{3+i\sqrt{3}}\right)}{\sqrt{3}\left(-\sqrt{3}+3i\right)}+\frac{x^2}{\sqrt{3}\left(\sqrt{3}+3i\right)}-\frac{x^2}{\sqrt{3}\left(-\sqrt{3}+3i\right)}-\frac{2x\log\left(1+\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(\sqrt{3}+3i\right)}+\frac{2x\log\left(1+\frac{2e^x}{3+i\sqrt{3}}\right)}{\sqrt{3}\left(-\sqrt{3}+3i\right)}$$

Antiderivative was successfully verified.

```
[In] Int[x/(3 + 3*E^x + E^(2*x)),x]
```

```
[Out] -(x^2/(Sqrt[3]*(3*I - Sqrt[3]))) + x^2/(Sqrt[3]*(3*I + Sqrt[3])) - (2*x*Log
[1 + (2*E^x)/(3 - I*Sqrt[3])])/(Sqrt[3]*(3*I + Sqrt[3])) + (2*x*Log[1 + (2*
E^x)/(3 + I*Sqrt[3])])/(Sqrt[3]*(3*I - Sqrt[3])) - (2*PolyLog[2, (-2*E^x)/(
3 - I*Sqrt[3])])/(Sqrt[3]*(3*I + Sqrt[3])) + (2*PolyLog[2, (-2*E^x)/(3 + I*
Sqrt[3])])/(Sqrt[3]*(3*I - Sqrt[3]))
```

Rule 2215

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[(c + d*x)^m*((F^(g*(e + f*x)))^n/(a + b*(F^(g*(e + f*x)))^n)), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2295

```
Int[((f_.) + (g_.)*(x_))^(m_.)/((a_.) + (b_.)*(F_)^(u_) + (c_.)*(F_)^(v_)),
 x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[(f + g*x)^m/
(b - q + 2*c*F^u), x], x] - Dist[2*(c/q), Int[(f + g*x)^m/(b + q + 2*c*F^u)
, x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v, 2*u] && LinearQ[u, x] &
& NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$
\begin{aligned}
\int \frac{x}{3+3e^x+e^{2x}}\,dx &= -\frac{(2i)\int \frac{x}{3-i\sqrt{3}+2e^x}\,dx}{\sqrt{3}}+\frac{(2i)\int \frac{x}{3+i\sqrt{3}+2e^x}\,dx}{\sqrt{3}} \\
&= -\frac{x^2}{\sqrt{3}\left(3i-\sqrt{3}\right)}+\frac{x^2}{\sqrt{3}\left(3i+\sqrt{3}\right)}+\frac{(4i)\int \frac{e^x x}{3-i\sqrt{3}+2e^x}\,dx}{\sqrt{3}\left(3-i\sqrt{3}\right)}-\frac{(4i)\int \frac{e^x x}{3+i\sqrt{3}+2e^x}\,d}{\sqrt{3}\left(3+i\sqrt{3}\right)} \\
&= -\frac{x^2}{\sqrt{3}\left(3i-\sqrt{3}\right)}+\frac{x^2}{\sqrt{3}\left(3i+\sqrt{3}\right)}-\frac{2x\log\left(1+\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(3i+\sqrt{3}\right)}+\frac{2x\log\left(1+\frac{2e^x}{3+i\sqrt{3}}\right.}{\sqrt{3}\left(3i-\sqrt{3}\right.} \\
&= -\frac{x^2}{\sqrt{3}\left(3i-\sqrt{3}\right)}+\frac{x^2}{\sqrt{3}\left(3i+\sqrt{3}\right)}-\frac{2x\log\left(1+\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(3i+\sqrt{3}\right)}+\frac{2x\log\left(1+\frac{2e^x}{3+i\sqrt{3}}\right.}{\sqrt{3}\left(3i-\sqrt{3}\right.} \\
&= -\frac{x^2}{\sqrt{3}\left(3i-\sqrt{3}\right)}+\frac{x^2}{\sqrt{3}\left(3i+\sqrt{3}\right)}-\frac{2x\log\left(1+\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(3i+\sqrt{3}\right)}+\frac{2x\log\left(1+\frac{2e^x}{3+i\sqrt{3}}\right.}{\sqrt{3}\left(3i-\sqrt{3}\right.}
\end{aligned}
$$

Mathematica [A]

time = 0.08, size = 144, normalized size = 0.71

$$\frac{-x\left(\left(-3i+\sqrt{3}\right)\log\left(1+\frac{1}{2}\left(3-i\sqrt{3}\right)e^{-x}\right)+\left(3i+\sqrt{3}\right)\log\left(1+\frac{1}{2}\left(3+i\sqrt{3}\right)e^{-x}\right)\right)+\left(3i+\sqrt{3}\right)\text{Li}_2\left(-\frac{1}{2}i\left(-3i+\sqrt{3}\right)e^{-x}\right)+\left(-3i+\sqrt{3}\right)\text{Li}_2\left(\frac{1}{2}i\left(3i+\sqrt{3}\right)e^{-x}\right)}{6\sqrt{3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(3 + 3*E^x + E^(2*x)),x]
```

```
[Out] (-(x*((-3*I + Sqrt[3])*Log[1 + (3 - I*Sqrt[3])/(2*E^x)] + (3*I + Sqrt[3])*L
og[1 + (3 + I*Sqrt[3])/(2*E^x)])) + (3*I + Sqrt[3])*PolyLog[2, ((-1/2*I)*(-
3*I + Sqrt[3]))/E^x] + (-3*I + Sqrt[3])*PolyLog[2, ((I/2)*(3*I + Sqrt[3]))/
E^x])/(6*Sqrt[3])
```

Maple [A]
time = 0.03, size = 235, normalized size = 1.15

method	result
default	$\frac{i\sqrt{3}\,x\ln\left(\frac{i\sqrt{3}-2\,e^{x}-3}{-3+i\sqrt{3}}\right)}{6}-\frac{x\ln\left(\frac{i\sqrt{3}-2\,e^{x}-3}{-3+i\sqrt{3}}\right)}{6}-\frac{i\sqrt{3}\,x\ln\left(\frac{i\sqrt{3}+2\,e^{x}+3}{3+i\sqrt{3}}\right)}{6}-\frac{x\ln\left(\frac{i\sqrt{3}+2\,e^{x}+3}{3+i\sqrt{3}}\right)}{6}+\frac{i\sqrt{3}\,\operatorname{dilog}(}{}$
risch	$\frac{i\sqrt{3}\,x\ln\left(\frac{i\sqrt{3}-2\,e^{x}-3}{-3+i\sqrt{3}}\right)}{6}-\frac{x\ln\left(\frac{i\sqrt{3}-2\,e^{x}-3}{-3+i\sqrt{3}}\right)}{6}-\frac{i\sqrt{3}\,x\ln\left(\frac{i\sqrt{3}+2\,e^{x}+3}{3+i\sqrt{3}}\right)}{6}-\frac{x\ln\left(\frac{i\sqrt{3}+2\,e^{x}+3}{3+i\sqrt{3}}\right)}{6}+\frac{i\sqrt{3}\,\operatorname{dilog}(}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(3+3*exp(x)+exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/6*I*3^(1/2)*x*ln((I*3^(1/2)-2*exp(x)-3)/(-3+I*3^(1/2)))-1/6*x*ln((I*3^(1/
2)-2*exp(x)-3)/(-3+I*3^(1/2)))-1/6*I*3^(1/2)*x*ln((I*3^(1/2)+2*exp(x)+3)/(3
+I*3^(1/2)))-1/6*x*ln((I*3^(1/2)+2*exp(x)+3)/(3+I*3^(1/2)))+1/6*I*3^(1/2)*d
ilog((I*3^(1/2)-2*exp(x)-3)/(-3+I*3^(1/2)))-1/6*dilog((I*3^(1/2)-2*exp(x)-3
)/(-3+I*3^(1/2)))-1/6*I*3^(1/2)*dilog((I*3^(1/2)+2*exp(x)+3)/(3+I*3^(1/2)))
-1/6*dilog((I*3^(1/2)+2*exp(x)+3)/(3+I*3^(1/2)))+1/6*x^2
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(3+3*exp(x)+exp(2*x)),x, algorithm="maxima")
```

```
[Out] integrate(x/(e^(2*x) + 3*e^x + 3), x)
```

Fricas [A]
time = 0.37, size = 100, normalized size = 0.49

$$\frac{1}{6}x^2+\frac{1}{6}\left(i\sqrt{3}-1\right)\text{Li}_2\left(-\frac{1}{6}\left(i\sqrt{3}+3\right)e^{x}\right)+\frac{1}{6}\left(-i\sqrt{3}-1\right)\text{Li}_2\left(-\frac{1}{6}\left(-i\sqrt{3}+3\right)e^{x}\right)+\frac{1}{6}\left(i\sqrt{3}\,x-x\right)\log\left(\frac{1}{6}\left(i\sqrt{3}+3\right)e^{x}+1\right)+\frac{1}{6}\left(-i\sqrt{3}\,x-x\right)\log\left(\frac{1}{6}\left(-i\sqrt{3}+3\right)e^{x}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(3+3*exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/6*x^2 + 1/6*(I*sqrt(3) - 1)*dilog(-1/6*(I*sqrt(3) + 3)*e^x) + 1/6*(-I*sqr
t(3) - 1)*dilog(-1/6*(-I*sqrt(3) + 3)*e^x) + 1/6*(I*sqrt(3)*x - x)*log(1/6*
(I*sqrt(3) + 3)*e^x + 1) + 1/6*(-I*sqrt(3)*x - x)*log(1/6*(-I*sqrt(3) + 3)*
e^x + 1)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{e^{2x} + 3e^{x} + 3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(3+3*exp(x)+exp(2*x)),x)
```

```
[Out] Integral(x/(exp(2*x) + 3*exp(x) + 3), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(3+3*exp(x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] integrate(x/(e^(2*x) + 3*e^x + 3), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x}{\mathrm{e}^{2\,x} + 3\,\mathrm{e}^{x} + 3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(exp(2*x) + 3*exp(x) + 3),x)
```

```
[Out] int(x/(exp(2*x) + 3*exp(x) + 3), x)
```

3.514 $\int \frac{x}{a+be^x+ce^{2x}}\,dx$

Optimal. Leaf size=276

$$-\frac{cx^2}{b^2-4ac-b\sqrt{b^2-4ac}}-\frac{cx^2}{b^2-4ac+b\sqrt{b^2-4ac}}+\frac{2cx\log\left(1+\frac{2ce^x}{b-\sqrt{b^2-4ac}}\right)}{b^2-4ac-b\sqrt{b^2-4ac}}+\frac{2cx\log\left(1+\frac{2ce^x}{b+\sqrt{b^2-4ac}}\right)}{b^2-4ac+b\sqrt{b^2-4ac}}$$

```
[Out] -c*x^2/(b^2-4*a*c-b*(-4*a*c+b^2)^(1/2))+2*c*x*ln(1+2*c*exp(x)/(b-(-4*a*c+b^
2)^(1/2)))/(b^2-4*a*c-b*(-4*a*c+b^2)^(1/2))+2*c*polylog(2,-2*c*exp(x)/(b-(-
4*a*c+b^2)^(1/2)))/(b^2-4*a*c-b*(-4*a*c+b^2)^(1/2))-c*x^2/(b^2-4*a*c+b*(-4*
a*c+b^2)^(1/2))+2*c*x*ln(1+2*c*exp(x)/(b+(-4*a*c+b^2)^(1/2)))/(b^2-4*a*c+b*
(-4*a*c+b^2)^(1/2))+2*c*polylog(2,-2*c*exp(x)/(b+(-4*a*c+b^2)^(1/2)))/(b^2-
4*a*c+b*(-4*a*c+b^2)^(1/2))
```

Rubi [A]
time = 0.28, antiderivative size = 276, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.278$, Rules used = {2295, 2215, 2221, 2317, 2438}

$$\frac{2c\text{PolyLog}\left(2,-\frac{2ce^x}{b-\sqrt{b^2-4ac}}\right)}{-b\sqrt{b^2-4ac}-4ac+b^2}+\frac{2c\text{PolyLog}\left(2,-\frac{2ce^x}{\sqrt{b^2-4ac}+b}\right)}{b\sqrt{b^2-4ac}-4ac+b^2}-\frac{cx^2}{-b\sqrt{b^2-4ac}-4ac+b^2}-\frac{cx^2}{b\sqrt{b^2-4ac}-4ac+b^2}+\frac{2cx\log\left(\frac{2ce^x}{b-\sqrt{b^2-4ac}}+1\right)}{-b\sqrt{b^2-4ac}-4ac+b^2}+\frac{2cx\log\left(\frac{2ce^x}{\sqrt{b^2-4ac}+b}+1\right)}{b\sqrt{b^2-4ac}-4ac+b^2}$$

Antiderivative was successfully verified.

```
[In] Int[x/(a + b*E^x + c*E^(2*x)),x]
```

```
[Out] -((c*x^2)/(b^2 - 4*a*c - b*Sqrt[b^2 - 4*a*c])) - (c*x^2)/(b^2 - 4*a*c + b*S
qrt[b^2 - 4*a*c]) + (2*c*x*Log[1 + (2*c*E^x)/(b - Sqrt[b^2 - 4*a*c])])/(b^2
 - 4*a*c - b*Sqrt[b^2 - 4*a*c]) + (2*c*x*Log[1 + (2*c*E^x)/(b + Sqrt[b^2 -
4*a*c])])/(b^2 - 4*a*c + b*Sqrt[b^2 - 4*a*c]) + (2*c*PolyLog[2, (-2*c*E^x)/
(b - Sqrt[b^2 - 4*a*c])])/(b^2 - 4*a*c - b*Sqrt[b^2 - 4*a*c]) + (2*c*PolyLo
g[2, (-2*c*E^x)/(b + Sqrt[b^2 - 4*a*c])])/(b^2 - 4*a*c + b*Sqrt[b^2 - 4*a*c
])
```

Rule 2215

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[(c + d*x)^m*((F^(g*(e + f*x)))^n/(a + b*(F^(g*(e + f*x)))^n)), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
```

```
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2295

```
Int[((f_.) + (g_.)*(x_))^(m_.)/((a_.) + (b_.)*(F_)^(u_) + (c_.)*(F_)^(v_)),
 x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[(f + g*x)^m/
(b - q + 2*c*F^u), x], x] - Dist[2*(c/q), Int[(f + g*x)^m/(b + q + 2*c*F^u)
, x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v, 2*u] && LinearQ[u, x] &
& NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{x}{a+be^x+ce^{2x}}\,dx &= \frac{(2c)\int \frac{x}{b-\sqrt{b^2-4ac}+2ce^x}\,dx}{\sqrt{b^2-4ac}} - \frac{(2c)\int \frac{x}{b+\sqrt{b^2-4ac}+2ce^x}\,dx}{\sqrt{b^2-4ac}}\\
&= -\frac{cx^2}{b^2-4ac-b\sqrt{b^2-4ac}} - \frac{cx^2}{b^2-4ac+b\sqrt{b^2-4ac}} + \frac{(4c^2)\int \frac{e^x x}{b-\sqrt{b^2-4ac}+2ce^x}\,d}{b^2-4ac-b\sqrt{b^2-4ac}}\\
&= -\frac{cx^2}{b^2-4ac-b\sqrt{b^2-4ac}} - \frac{cx^2}{b^2-4ac+b\sqrt{b^2-4ac}} + \frac{2cx\log\left(1+\frac{2ce^x}{b-\sqrt{b^2-4ac}}\right)}{b^2-4ac-b\sqrt{b^2-4ac}}\\
&= -\frac{cx^2}{b^2-4ac-b\sqrt{b^2-4ac}} - \frac{cx^2}{b^2-4ac+b\sqrt{b^2-4ac}} + \frac{2cx\log\left(1+\frac{2ce^x}{b-\sqrt{b^2-4ac}}\right)}{b^2-4ac-b\sqrt{b^2-4ac}}\\
&= -\frac{cx^2}{b^2-4ac-b\sqrt{b^2-4ac}} - \frac{cx^2}{b^2-4ac+b\sqrt{b^2-4ac}} + \frac{2cx\log\left(1+\frac{2ce^x}{b-\sqrt{b^2-4ac}}\right)}{b^2-4ac-b\sqrt{b^2-4ac}}\end{aligned}$$

Mathematica [A]

time = 0.17, size = 205, normalized size = 0.74

$$\frac{x\left(\sqrt{b^2-4ac}\,x-\left(b+\sqrt{b^2-4ac}\right)\log\left(1+\frac{2ce^x}{b-\sqrt{b^2-4ac}}\right)+\left(b-\sqrt{b^2-4ac}\right)\log\left(1+\frac{2ce^x}{b+\sqrt{b^2-4ac}}\right)\right)-\left(b+\sqrt{b^2-4ac}\right)\text{Li}_2\left(\frac{2ce^x}{-b+\sqrt{b^2-4ac}}\right)+\left(b-\sqrt{b^2-4ac}\right)\text{Li}_2\left(-\frac{2ce^x}{b+\sqrt{b^2-4ac}}\right)}{2a\sqrt{b^2-4ac}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(a + b*E^x + c*E^(2*x)),x]
```

```
[Out] (x*(Sqrt[b^2 - 4*a*c]*x - (b + Sqrt[b^2 - 4*a*c])*Log[1 + (2*c*E^x)/(b - Sq
rt[b^2 - 4*a*c])] + (b - Sqrt[b^2 - 4*a*c])*Log[1 + (2*c*E^x)/(b + Sqrt[b^2
 - 4*a*c])]) - (b + Sqrt[b^2 - 4*a*c])*PolyLog[2, (2*c*E^x)/(-b + Sqrt[b^2
- 4*a*c])] + (b - Sqrt[b^2 - 4*a*c])*PolyLog[2, (-2*c*E^x)/(b + Sqrt[b^2 -
4*a*c])])/(2*a*Sqrt[b^2 - 4*a*c])
```

Maple [A]
time = 0.04, size = 376, normalized size = 1.36

method	result
default	$\frac{x^2}{2a}+\frac{-\frac{x\left(\ln\left(\frac{-2c\,e^x+\sqrt{-4ca+b^2}-b}{-b+\sqrt{-4ca+b^2}}\right)\sqrt{-4ca+b^2}+\ln\left(\frac{-2c\,e^x+\sqrt{-4ca+b^2}-b}{-b+\sqrt{-4ca+b^2}}\right)b+\ln\left(\frac{2c\,e^x+\sqrt{-4ca+b^2}+b}{b+\sqrt{-4ca+b^2}}\right)\right.}{2\sqrt{-4ca+b^2}}}{}$
risch	$\frac{x^2}{2a}-\frac{x\ln\left(\frac{2c\,e^x+\sqrt{-4ca+b^2}+b}{b+\sqrt{-4ca+b^2}}\right)}{2a}-\frac{x\ln\left(\frac{-2c\,e^x+\sqrt{-4ca+b^2}-b}{-b+\sqrt{-4ca+b^2}}\right)}{2a}+\frac{x\ln\left(\frac{2c\,e^x+\sqrt{-4ca+b^2}+b}{b+\sqrt{-4ca+b^2}}\right)b}{2a\sqrt{-4ca+b^2}}-\frac{x\ln\left(\right.}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a+b*exp(x)+c*exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*x^2/a+(-1/2*x*(ln((-2*c*exp(x)+(-4*a*c+b^2)^(1/2)-b)/(-b+(-4*a*c+b^2)^(
1/2)))*(-4*a*c+b^2)^(1/2)+ln((-2*c*exp(x)+(-4*a*c+b^2)^(1/2)-b)/(-b+(-4*a*c
+b^2)^(1/2)))*b+ln((2*c*exp(x)+(-4*a*c+b^2)^(1/2)+b)/(b+(-4*a*c+b^2)^(1/2))
)*(-4*a*c+b^2)^(1/2)-ln((2*c*exp(x)+(-4*a*c+b^2)^(1/2)+b)/(b+(-4*a*c+b^2)^(
1/2)))*b)/(-4*a*c+b^2)^(1/2)-1/2*(dilog((-2*c*exp(x)+(-4*a*c+b^2)^(1/2)-b)/
(-b+(-4*a*c+b^2)^(1/2)))*(-4*a*c+b^2)^(1/2)+dilog((-2*c*exp(x)+(-4*a*c+b^2)
^(1/2)-b)/(-b+(-4*a*c+b^2)^(1/2)))*b+dilog((2*c*exp(x)+(-4*a*c+b^2)^(1/2)+b
)/(b+(-4*a*c+b^2)^(1/2)))*(-4*a*c+b^2)^(1/2)-dilog((2*c*exp(x)+(-4*a*c+b^2)
^(1/2)+b)/(b+(-4*a*c+b^2)^(1/2)))*b)/(-4*a*c+b^2)^(1/2))/a
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*exp(x)+c*exp(2*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re deta
```

Fricas [A]
time = 0.41, size = 280, normalized size = 1.01

$$\frac{(b^2-4\,ac)x^2-\left(ab\sqrt{\frac{b^2-4\,ac}{a^2}}+b^2-4\,ac\right)\mathrm{Li}_2\left(-\frac{a\sqrt{\frac{b^2-4\,ac}{a^2}}\,e^x+be^x+2\,a}{2\,a}+1\right)+\left(ab\sqrt{\frac{b^2-4\,ac}{a^2}}-b^2+4\,ac\right)\mathrm{Li}_2\left(\frac{a\sqrt{\frac{b^2-4\,ac}{a^2}}\,e^x-be^x-2\,a}{2\,a}+1\right)-\left(abx\sqrt{\frac{b^2-4\,ac}{a^2}}+(b^2-4\,ac)x\right)\log\left(\frac{a\sqrt{\frac{b^2-4\,ac}{a^2}}\,e^x+be^x+2\,a}{2\,a}\right)+\left(abx\sqrt{\frac{b^2-4\,ac}{a^2}}-(b^2-4\,ac)x\right)\log\left(-\frac{a\sqrt{\frac{b^2-4\,ac}{a^2}}\,e^x-be^x-2\,a}{2\,a}\right)}{2\,(ab^2-4\,a^2c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*exp(x)+c*exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/2*((b^2 - 4*a*c)*x^2 - (a*b*sqrt((b^2 - 4*a*c)/a^2) + b^2 - 4*a*c)*dilog(
-1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^x + b*e^x + 2*a)/a + 1) + (a*b*sqrt((b^2
- 4*a*c)/a^2) - b^2 + 4*a*c)*dilog(1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^x - b*e
^x - 2*a)/a + 1) - (a*b*x*sqrt((b^2 - 4*a*c)/a^2) + (b^2 - 4*a*c)*x)*log(1/
2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^x + b*e^x + 2*a)/a) + (a*b*x*sqrt((b^2 - 4*a
*c)/a^2) - (b^2 - 4*a*c)*x)*log(-1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^x - b*e^x
 - 2*a)/a))/(a*b^2 - 4*a^2*c)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{a+be^x+ce^{2x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*exp(x)+c*exp(2*x)),x)
```

```
[Out] Integral(x/(a + b*exp(x) + c*exp(2*x)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*exp(x)+c*exp(2*x)),x, algorithm="giac")
```

```
[Out] integrate(x/(c*e^(2*x) + b*e^x + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x}{a+b\,\mathrm{e}^x+c\,\mathrm{e}^{2\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a + b*exp(x) + c*exp(2*x)),x)
[Out] int(x/(a + b*exp(x) + c*exp(2*x)), x)
```

3.515 $\int \frac{x^2}{1+2e^x+e^{2x}}\,dx$

Optimal. Leaf size=72

$$-x^2+\frac{x^2}{1+e^x}+\frac{x^3}{3}+2x\log\left(1+e^x\right)-x^2\log\left(1+e^x\right)+2\text{Li}_2(-e^x)-2x\text{Li}_2(-e^x)+2\text{Li}_3(-e^x)$$

```
[Out] -x^2+x^2/(1+exp(x))+1/3*x^3+2*x*ln(1+exp(x))-x^2*ln(1+exp(x))+2*polylog(2,-
exp(x))-2*x*polylog(2,-exp(x))+2*polylog(3,-exp(x))
```

Rubi [A]
time = 0.15, antiderivative size = 72, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 10, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.556$, Rules used = {6820, 2216, 2215, 2221, 2611, 2320, 6724, 2222, 2317, 2438}

$$-2x\text{PolyLog}(2,-e^x)+2\text{PolyLog}(2,-e^x)+2\text{PolyLog}(3,-e^x)+\frac{x^3}{3}+\frac{x^2}{e^x+1}-x^2-x^2\log\left(e^x+1\right)+2x\log\left(e^x+1\right)$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(1 + 2*E^x + E^(2*x)),x]
```

```
[Out] -x^2 + x^2/(1 + E^x) + x^3/3 + 2*x*Log[1 + E^x] - x^2*Log[1 + E^x] + 2*Poly
Log[2, -E^x] - 2*x*PolyLog[2, -E^x] + 2*PolyLog[3, -E^x]
```

Rule 2215

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[(c + d*x)^m*((F^(g*(e + f*x)))^n/(a + b*(F^(g*(e + f*x)))^n)), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2216

```
Int[((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.))^(p_)*((c_.) +
(d_.)*(x_))^(m_.), x_Symbol] :> Dist[1/a, Int[(c + d*x)^m*(a + b*(F^(g*(e +
 f*x)))^n)^(p + 1), x], x] - Dist[b/a, Int[(c + d*x)^m*(F^(g*(e + f*x)))^n*
(a + b*(F^(g*(e + f*x)))^n)^p, x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n},
 x] && ILtQ[p, 0] && IGtQ[m, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2222

```
Int[((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((a_.) + (b_.)*((F_)^((g_.)*(
(e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :>
 Simp[(c + d*x)^m*((a + b*(F^(g*(e + f*x)))^n)^(p + 1)/(b*f*g*n*(p + 1)*Log
[F])), x] - Dist[d*(m/(b*f*g*n*(p + 1)*Log[F])), Int[(c + d*x)^(m - 1)*(a +
 b*(F^(g*(e + f*x)))^n)^(p + 1), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m
, n, p}, x] && NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6820

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rubi steps

$$
\begin{aligned}
\int \frac{x^2}{1+2e^x+e^{2x}}\,dx &= \int \frac{x^2}{(1+e^x)^2}\,dx\\
&= -\int \frac{e^x x^2}{(1+e^x)^2}\,dx + \int \frac{x^2}{1+e^x}\,dx\\
&= \frac{x^2}{1+e^x} + \frac{x^3}{3} - 2\int \frac{x}{1+e^x}\,dx - \int \frac{e^x x^2}{1+e^x}\,dx\\
&= -x^2 + \frac{x^2}{1+e^x} + \frac{x^3}{3} - x^2\log(1+e^x) + 2\int \frac{e^x x}{1+e^x}\,dx + 2\int x\log(1+e^x)\,dx\\
&= -x^2 + \frac{x^2}{1+e^x} + \frac{x^3}{3} + 2x\log(1+e^x) - x^2\log(1+e^x) - 2x\text{Li}_2(-e^x) - 2\int \log(1+e\\
&= -x^2 + \frac{x^2}{1+e^x} + \frac{x^3}{3} + 2x\log(1+e^x) - x^2\log(1+e^x) - 2x\text{Li}_2(-e^x) - 2\text{Subst}\bigg(\int \frac{\text{lo}}{}\\
&= -x^2 + \frac{x^2}{1+e^x} + \frac{x^3}{3} + 2x\log(1+e^x) - x^2\log(1+e^x) + 2\text{Li}_2(-e^x) - 2x\text{Li}_2(-e^x) +
\end{aligned}
$$

Mathematica [A]
time = 0.08, size = 57, normalized size = 0.79

$$\frac{x^2(e^x(-3+x)+x)}{3(1+e^x)} - (-2+x)x\log(1+e^x) - 2(-1+x)\text{Li}_2(-e^x) + 2\text{Li}_3(-e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(1 + 2*E^x + E^(2*x)),x]
```

```
[Out] (x^2*(E^x*(-3 + x) + x))/(3*(1 + E^x)) - (-2 + x)*x*Log[1 + E^x] - 2*(-1 +
x)*PolyLog[2, -E^x] + 2*PolyLog[3, -E^x]
```

Maple [A]
time = 0.02, size = 65, normalized size = 0.90

method	result
risch	$-x^2 + \frac{x^2}{1+e^x} + \frac{x^3}{3} + 2x\ln(1+e^x) - x^2\ln(1+e^x) + 2\,\text{polylog}(2,-e^x) - 2x\,\text{polylog}(2,-e^x) + 2$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(1+2*exp(x)+exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -x^2+x^2/(1+exp(x))+1/3*x^3+2*x*ln(1+exp(x))-x^2*ln(1+exp(x))+2*polylog(2,-
exp(x))-2*x*polylog(2,-exp(x))+2*polylog(3,-exp(x))
```

Maxima [A]
time = 0.28, size = 62, normalized size = 0.86

$$\frac{1}{3}x^3 - x^2\log\left(e^x+1\right) - x^2 - 2\,x\mathrm{Li}_2(-e^x) + 2\,x\log\left(e^x+1\right) + \frac{x^2}{e^x+1} + 2\,\mathrm{Li}_2(-e^x) + 2\,\mathrm{Li}_3(-e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(1+2*exp(x)+exp(2*x)),x, algorithm="maxima")
```

```
[Out] 1/3*x^3 - x^2*log(e^x + 1) - x^2 - 2*x*dilog(-e^x) + 2*x*log(e^x + 1) + x^2
/(e^x + 1) + 2*dilog(-e^x) + 2*polylog(3, -e^x)
```

Fricas [A]
time = 0.36, size = 76, normalized size = 1.06

$$\frac{x^3 - 6\left((x-1)e^x + x - 1\right)\mathrm{Li}_2(-e^x) + \left(x^3 - 3\,x^2\right)e^x - 3\left(x^2 + \left(x^2 - 2\,x\right)e^x - 2\,x\right)\log\left(e^x+1\right) + 6\left(e^x+1\right)\mathrm{polylog}(3, -e^x)}{3\left(e^x+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(1+2*exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/3*(x^3 - 6*((x - 1)*e^x + x - 1)*dilog(-e^x) + (x^3 - 3*x^2)*e^x - 3*(x^2
 + (x^2 - 2*x)*e^x - 2*x)*log(e^x + 1) + 6*(e^x + 1)*polylog(3, -e^x))/(e^x
 + 1)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{x^2}{e^x+1} + \int \frac{x(x-2)}{e^x+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(1+2*exp(x)+exp(2*x)),x)
```

```
[Out] x**2/(exp(x) + 1) + Integral(x*(x - 2)/(exp(x) + 1), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(1+2*exp(x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] integrate(x^2/(e^(2*x) + 2*e^x + 1), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{e^{2x} + 2e^x + 1} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(exp(2*x) + 2*exp(x) + 1),x)
[Out] int(x^2/(exp(2*x) + 2*exp(x) + 1), x)
```

3.516 $\int \frac{x^2}{2+3e^x+e^{2x}} \, dx$

Optimal. Leaf size=77

$$\frac{x^3}{6}+\frac{1}{2}x^2\log\left(1+\frac{e^x}{2}\right)-x^2\log\left(1+e^x\right)-2x\text{Li}_2(-e^x)+x\text{Li}_2\left(-\frac{e^x}{2}\right)+2\text{Li}_3(-e^x)-\text{Li}_3\left(-\frac{e^x}{2}\right)$$

```
[Out] 1/6*x^3+1/2*x^2*ln(1+1/2*exp(x))-x^2*ln(1+exp(x))-2*x*polylog(2,-exp(x))+x*
polylog(2,-1/2*exp(x))+2*polylog(3,-exp(x))-polylog(3,-1/2*exp(x))
```

Rubi [A]
time = 0.14, antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 6, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {2295, 2215, 2221, 2611, 2320, 6724}

$$-2x\text{PolyLog}(2,-e^x)+x\text{PolyLog}\left(2,-\frac{e^x}{2}\right)+2\text{PolyLog}(3,-e^x)-\text{PolyLog}\left(3,-\frac{e^x}{2}\right)+\frac{x^3}{6}+\frac{1}{2}x^2\log\left(\frac{e^x}{2}+1\right)-x^2\log\left(e^x+1\right)$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(2 + 3*E^x + E^(2*x)),x]
```

```
[Out] x^3/6 + (x^2*Log[1 + E^x/2])/2 - x^2*Log[1 + E^x] - 2*x*PolyLog[2, -E^x] +
x*PolyLog[2, -1/2*E^x] + 2*PolyLog[3, -E^x] - PolyLog[3, -1/2*E^x]
```

Rule 2215

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[(c + d*x)^m*((F^(g*(e + f*x)))^n/(a + b*(F^(g*(e + f*x)))^n)), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2295

```
Int[((f_.) + (g_.)*(x_))^(m_.)/((a_.) + (b_.)*(F_)^(u_) + (c_.)*(F_)^(v_)),
 x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[(f + g*x)^m/
(b - q + 2*c*F^u), x], x] - Dist[2*(c/q), Int[(f + g*x)^m/(b + q + 2*c*F^u)
, x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v, 2*u] && LinearQ[u, x] &
& NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2}{2+3e^x+e^{2x}}\,dx &= 2\int \frac{x^2}{2+2e^x}\,dx - 2\int \frac{x^2}{4+2e^x}\,dx \\
&= \frac{x^3}{6} - 2\int \frac{e^x x^2}{2+2e^x}\,dx + \int \frac{e^x x^2}{4+2e^x}\,dx \\
&= \frac{x^3}{6} + \frac{1}{2}x^2\log\left(1+\frac{e^x}{2}\right) - x^2\log\left(1+e^x\right) + 2\int x\log\left(1+e^x\right)\,dx - \int x\log\left(1+\frac{e^x}{2}\right. \\
&= \frac{x^3}{6} + \frac{1}{2}x^2\log\left(1+\frac{e^x}{2}\right) - x^2\log\left(1+e^x\right) - 2x\mathrm{Li}_2(-e^x) + x\mathrm{Li}_2\left(-\frac{e^x}{2}\right) + 2\int \mathrm{Li}_2(-e \\
&= \frac{x^3}{6} + \frac{1}{2}x^2\log\left(1+\frac{e^x}{2}\right) - x^2\log\left(1+e^x\right) - 2x\mathrm{Li}_2(-e^x) + x\mathrm{Li}_2\left(-\frac{e^x}{2}\right) + 2\mathrm{Subst}\Big(\int \\
&= \frac{x^3}{6} + \frac{1}{2}x^2\log\left(1+\frac{e^x}{2}\right) - x^2\log\left(1+e^x\right) - 2x\mathrm{Li}_2(-e^x) + x\mathrm{Li}_2\left(-\frac{e^x}{2}\right) + 2\mathrm{Li}_3(-e^x)
\end{aligned}$$

Mathematica [A]
time = 0.06, size = 77, normalized size = 1.00

$$-x^2\log\left(1+e^{-x}\right) + \frac{1}{2}x^2\log\left(1+2e^{-x}\right) - x\mathrm{Li}_2\left(-2e^{-x}\right) + 2x\mathrm{Li}_2\left(-e^{-x}\right) - \mathrm{Li}_3\left(-2e^{-x}\right) + 2\mathrm{Li}_3\left(-e^{-x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(2 + 3*E^x + E^(2*x)),x]
```

```
[Out] -(x^2*Log[1 + E^(-x)]) + (x^2*Log[1 + 2/E^x])/2 - x*PolyLog[2, -2/E^x] + 2*
x*PolyLog[2, -E^(-x)] - PolyLog[3, -2/E^x] + 2*PolyLog[3, -E^(-x)]
```

Maple [A]
time = 0.02, size = 62, normalized size = 0.81

method	result
default	$\frac{x^3}{6}+\frac{x^2\ln\left(1+\frac{e^x}{2}\right)}{2}-x^2\ln\left(1+e^x\right)-2x\,\mathrm{polylog}\left(2,-e^x\right)+x\,\mathrm{polylog}\left(2,-\frac{e^x}{2}\right)+2\,\mathrm{polylog}\left(3,-e^x\right)-$
risch	$\frac{x^3}{6}+\frac{x^2\ln\left(1+\frac{e^x}{2}\right)}{2}-x^2\ln\left(1+e^x\right)-2x\,\mathrm{polylog}\left(2,-e^x\right)+x\,\mathrm{polylog}\left(2,-\frac{e^x}{2}\right)+2\,\mathrm{polylog}\left(3,-e^x\right)-$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(2+3*exp(x)+exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/6*x^3+1/2*x^2*ln(1+1/2*exp(x))-x^2*ln(1+exp(x))-2*x*polylog(2,-exp(x))+x*
polylog(2,-1/2*exp(x))+2*polylog(3,-exp(x))-polylog(3,-1/2*exp(x))
```

Maxima [A]
time = 0.31, size = 59, normalized size = 0.77

$$\frac{1}{6}x^3-x^2\log\left(e^x+1\right)+\frac{1}{2}x^2\log\left(\frac{1}{2}e^x+1\right)+x\mathrm{Li}_2\left(-\frac{1}{2}e^x\right)-2x\mathrm{Li}_2(-e^x)-\mathrm{Li}_3(-\frac{1}{2}e^x)+2\,\mathrm{Li}_3(-e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(2+3*exp(x)+exp(2*x)),x, algorithm="maxima")
```

```
[Out] 1/6*x^3 - x^2*log(e^x + 1) + 1/2*x^2*log(1/2*e^x + 1) + x*dilog(-1/2*e^x) -
 2*x*dilog(-e^x) - polylog(3, -1/2*e^x) + 2*polylog(3, -e^x)
```

Fricas [A]
time = 0.38, size = 59, normalized size = 0.77

$$\frac{1}{6}x^3-x^2\log\left(e^x+1\right)+\frac{1}{2}x^2\log\left(\frac{1}{2}e^x+1\right)+x\mathrm{Li}_2\left(-\frac{1}{2}e^x\right)-2x\mathrm{Li}_2(-e^x)-\mathrm{polylog}\left(3,-\frac{1}{2}e^x\right)+2\,\mathrm{polylog}(3,-e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(2+3*exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/6*x^3 - x^2*log(e^x + 1) + 1/2*x^2*log(1/2*e^x + 1) + x*dilog(-1/2*e^x) -
 2*x*dilog(-e^x) - polylog(3, -1/2*e^x) + 2*polylog(3, -e^x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{x^2}{\left(e^x+1\right)\left(e^x+2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(2+3*exp(x)+exp(2*x)),x)
```

```
[Out] Integral(x**2/((exp(x) + 1)*(exp(x) + 2)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(2+3*exp(x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] integrate(x^2/(e^(2*x) + 3*e^x + 2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{e^{2x} + 3\,e^x + 2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(exp(2*x) + 3*exp(x) + 2),x)
```

```
[Out] int(x^2/(exp(2*x) + 3*exp(x) + 2), x)
```

3.517 $\int \frac{x^2}{-1+e^x+e^{2x}}\,dx$

Optimal. Leaf size=259

$$\frac{2x^3}{3\sqrt{5}\left(1-\sqrt{5}\right)}-\frac{2x^3}{3\sqrt{5}\left(1+\sqrt{5}\right)}-\frac{2x^2\log\left(1+\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)}+\frac{2x^2\log\left(1+\frac{2e^x}{1+\sqrt{5}}\right)}{\sqrt{5}\left(1+\sqrt{5}\right)}-\frac{4x\text{Li}_2\left(-\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)}+\frac{4x}{\sqrt{}}$$

```
[Out] 2/15*x^3/(-5^(1/2)+1)*5^(1/2)-2/5*x^2*ln(1+2*exp(x)/(-5^(1/2)+1))/(-5^(1/2)
+1)*5^(1/2)-4/5*x*polylog(2,-2*exp(x)/(-5^(1/2)+1))/(-5^(1/2)+1)*5^(1/2)+4/
5*polylog(3,-2*exp(x)/(-5^(1/2)+1))/(-5^(1/2)+1)*5^(1/2)-2/15*x^3*5^(1/2)/(
5^(1/2)+1)+2/5*x^2*ln(1+2*exp(x)/(5^(1/2)+1))*5^(1/2)/(5^(1/2)+1)+4/5*x*pol
ylog(2,-2*exp(x)/(5^(1/2)+1))*5^(1/2)/(5^(1/2)+1)-4/5*polylog(3,-2*exp(x)/(
5^(1/2)+1))*5^(1/2)/(5^(1/2)+1)
```

Rubi [A]
time = 0.19, antiderivative size = 259, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 6, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.375$, Rules used = {2295, 2215, 2221, 2611, 2320, 6724}

$$-\frac{4x\text{PolyLog}\left(2,-\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)}+\frac{4x\text{PolyLog}\left(2,-\frac{2e^x}{1+\sqrt{5}}\right)}{\sqrt{5}\left(1+\sqrt{5}\right)}+\frac{4\text{PolyLog}\left(3,-\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)}-\frac{4\text{PolyLog}\left(3,-\frac{2e^x}{1+\sqrt{5}}\right)}{\sqrt{5}\left(1+\sqrt{5}\right)}-\frac{2x^3}{3\sqrt{5}\left(1+\sqrt{5}\right)}+\frac{2x^3}{3\sqrt{5}\left(1-\sqrt{5}\right)}-\frac{2x^2\log\left(\frac{2e^x}{1-\sqrt{5}}+1\right)}{\sqrt{5}\left(1-\sqrt{5}\right)}+\frac{2x^2\log\left(\frac{2e^x}{1+\sqrt{5}}+1\right)}{\sqrt{5}\left(1+\sqrt{5}\right)}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(-1 + E^x + E^(2*x)),x]
```

```
[Out] (2*x^3)/(3*Sqrt[5]*(1 - Sqrt[5])) - (2*x^3)/(3*Sqrt[5]*(1 + Sqrt[5])) - (2*
x^2*Log[1 + (2*E^x)/(1 - Sqrt[5])])/(Sqrt[5]*(1 - Sqrt[5])) + (2*x^2*Log[1
+ (2*E^x)/(1 + Sqrt[5])])/(Sqrt[5]*(1 + Sqrt[5])) - (4*x*PolyLog[2, (-2*E^x
)/(1 - Sqrt[5])])/(Sqrt[5]*(1 - Sqrt[5])) + (4*x*PolyLog[2, (-2*E^x)/(1 + S
qrt[5])])/(Sqrt[5]*(1 + Sqrt[5])) + (4*PolyLog[3, (-2*E^x)/(1 - Sqrt[5])])/
(Sqrt[5]*(1 - Sqrt[5])) - (4*PolyLog[3, (-2*E^x)/(1 + Sqrt[5])])/(Sqrt[5]*(
1 + Sqrt[5]))
```

Rule 2215

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[(c + d*x)^m*((F^(g*(e + f*x)))^n/(a + b*(F^(g*(e + f*x)))^n)), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
```

```
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2295

```
Int[((f_.) + (g_.)*(x_))^(m_.)/((a_.) + (b_.)*(F_)^(u_) + (c_.)*(F_)^(v_)),
 x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[(f + g*x)^m/
(b - q + 2*c*F^u), x], x] - Dist[2*(c/q), Int[(f + g*x)^m/(b + q + 2*c*F^u)
, x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v, 2*u] && LinearQ[u, x] &
& NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^2}{-1+e^x+e^{2x}}\,dx = \frac{2\int \frac{x^2}{1-\sqrt{5}+2e^x}\,dx}{\sqrt{5}} - \frac{2\int \frac{x^2}{1+\sqrt{5}+2e^x}\,dx}{\sqrt{5}}$$

$$= \frac{2x^3}{3\sqrt{5}\left(1-\sqrt{5}\right)} - \frac{2x^3}{3\sqrt{5}\left(1+\sqrt{5}\right)} - \frac{4\int \frac{e^x x^2}{1-\sqrt{5}+2e^x}\,dx}{\sqrt{5}\left(1-\sqrt{5}\right)} + \frac{4\int \frac{e^x x^2}{1+\sqrt{5}+2e^x}\,dx}{\sqrt{5}\left(1+\sqrt{5}\right)}$$

$$= \frac{2x^3}{3\sqrt{5}\left(1-\sqrt{5}\right)} - \frac{2x^3}{3\sqrt{5}\left(1+\sqrt{5}\right)} - \frac{2x^2\log\left(1+\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)} + \frac{2x^2\log\left(1+\frac{2e^x}{1+\sqrt{5}\ldots}\right.}{\sqrt{5}\left(1+\sqrt{5}\right)}$$

$$= \frac{2x^3}{3\sqrt{5}\left(1-\sqrt{5}\right)} - \frac{2x^3}{3\sqrt{5}\left(1+\sqrt{5}\right)} - \frac{2x^2\log\left(1+\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)} + \frac{2x^2\log\left(1+\frac{2e^x}{1+\sqrt{5}\ldots}\right.}{\sqrt{5}\left(1+\sqrt{5}\right)}$$

$$= \frac{2x^3}{3\sqrt{5}\left(1-\sqrt{5}\right)} - \frac{2x^3}{3\sqrt{5}\left(1+\sqrt{5}\right)} - \frac{2x^2\log\left(1+\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)} + \frac{2x^2\log\left(1+\frac{2e^x}{1+\sqrt{5}\ldots}\right.}{\sqrt{5}\left(1+\sqrt{5}\right)}$$

$$= \frac{2x^3}{3\sqrt{5}\left(1-\sqrt{5}\right)} - \frac{2x^3}{3\sqrt{5}\left(1+\sqrt{5}\right)} - \frac{2x^2\log\left(1+\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)} + \frac{2x^2\log\left(1+\frac{2e^x}{1+\sqrt{5}\ldots}\right.}{\sqrt{5}\left(1+\sqrt{5}\right)}$$

Mathematica [A]
time = 0.11, size = 172, normalized size = 0.66

$$\frac{2\left(\frac{x^2\log\left(1-\frac{1}{2}\left(-1+\sqrt{5}\right)e^{-x}\right)}{-1+\sqrt{5}}+\frac{x^2\log\left(1+\frac{1}{2}\left(1+\sqrt{5}\right)e^{-x}\right)}{1+\sqrt{5}}-\frac{2\left(x\mathrm{Li}_2\left(\frac{1}{2}\left(-1+\sqrt{5}\right)e^{-x}\right)+\mathrm{Li}_3\left(\frac{1}{2}\left(-1+\sqrt{5}\right)e^{-x}\right)\right)}{-1+\sqrt{5}}-\frac{2\left(x\mathrm{Li}_2\left(-\frac{1}{2}\left(1+\sqrt{5}\right)e^{-x}\right)+\mathrm{Li}_3\left(-\frac{1}{2}\left(1+\sqrt{5}\right)e^{-x}\right)\right)}{1+\sqrt{5}}\right)}{\sqrt{5}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(-1 + E^x + E^(2*x)),x]
```

```
[Out] (2*((x^2*Log[1 - (-1 + Sqrt[5])/(2*E^x)])/(-1 + Sqrt[5]) + (x^2*Log[1 + (1
+ Sqrt[5])/(2*E^x)])/(1 + Sqrt[5]) - (2*(x*PolyLog[2, (-1 + Sqrt[5])/(2*E^x
)] + PolyLog[3, (-1 + Sqrt[5])/(2*E^x)]))/(-1 + Sqrt[5]) - (2*(x*PolyLog[2,
 -1/2*(1 + Sqrt[5])/E^x] + PolyLog[3, -1/2*(1 + Sqrt[5])/E^x]))/(1 + Sqrt[5
])))/Sqrt[5]
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{x^2}{-1+\mathrm{e}^x+\mathrm{e}^{2x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(-1+exp(x)+exp(2*x)),x)
```

```
[Out] int(x^2/(-1+exp(x)+exp(2*x)),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-1+exp(x)+exp(2*x)),x, algorithm="maxima")
```

```
[Out] integrate(x^2/(e^(2*x) + e^x - 1), x)
```

Fricas [A]
time = 0.40, size = 138, normalized size = 0.53

$$-\frac{1}{3}x^3+\frac{1}{5}\left(\sqrt{5}\,x+5\,x\right)\mathrm{Li}_2\left(\frac{1}{2}\left(\sqrt{5}+1\right)e^x\right)-\frac{1}{5}\left(\sqrt{5}\,x-5\,x\right)\mathrm{Li}_2\left(-\frac{1}{2}\left(\sqrt{5}-1\right)e^x\right)+\frac{1}{10}\left(\sqrt{5}\,x^2+5\,x^2\right)\log\left(-\frac{1}{2}\left(\sqrt{5}+1\right)e^x+1\right)-\frac{1}{10}\left(\sqrt{5}\,x^2-5\,x^2\right)\log\left(\frac{1}{2}\left(\sqrt{5}-1\right)e^x+1\right)-\frac{1}{5}\left(\sqrt{5}+5\right)\mathrm{polylog}\left(3,\frac{1}{2}\left(\sqrt{5}+1\right)e^x\right)+\frac{1}{5}\left(\sqrt{5}-5\right)\mathrm{polylog}\left(3,-\frac{1}{2}\left(\sqrt{5}-1\right)e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-1+exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] -1/3*x^3 + 1/5*(sqrt(5)*x + 5*x)*dilog(1/2*(sqrt(5) + 1)*e^x) - 1/5*(sqrt(5
)*x - 5*x)*dilog(-1/2*(sqrt(5) - 1)*e^x) + 1/10*(sqrt(5)*x^2 + 5*x^2)*log(-
1/2*(sqrt(5) + 1)*e^x + 1) - 1/10*(sqrt(5)*x^2 - 5*x^2)*log(1/2*(sqrt(5) -
1)*e^x + 1) - 1/5*(sqrt(5) + 5)*polylog(3, 1/2*(sqrt(5) + 1)*e^x) + 1/5*(sq
rt(5) - 5)*polylog(3, -1/2*(sqrt(5) - 1)*e^x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{e^{2x}+e^x-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(-1+exp(x)+exp(2*x)),x)
```

```
[Out] Integral(x**2/(exp(2*x) + exp(x) - 1), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-1+exp(x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] integrate(x^2/(e^(2*x) + e^x - 1), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2}{e^{2x} + e^x - 1} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(exp(2*x) + exp(x) - 1),x)
```

```
[Out] int(x^2/(exp(2*x) + exp(x) - 1), x)
```

3.518 $\int \frac{x^2}{3+3e^x+e^{2x}}\,dx$

Optimal. Leaf size=293

$$-\frac{2x^3}{3\sqrt{3}\left(3i-\sqrt{3}\right)}+\frac{2x^3}{3\sqrt{3}\left(3i+\sqrt{3}\right)}-\frac{2x^2\log\left(1+\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(3i+\sqrt{3}\right)}+\frac{2x^2\log\left(1+\frac{2e^x}{3+i\sqrt{3}}\right)}{\sqrt{3}\left(3i-\sqrt{3}\right)}-\frac{4x\text{Li}_2\left(-\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(3i+\sqrt{3}\right)}$$

```
[Out] -2/9*x^3/(3*I-3^(1/2))*3^(1/2)+2/3*x^2*ln(1+2*exp(x)/(3+I*3^(1/2)))/(3*I-3^
(1/2))*3^(1/2)+4/3*x*polylog(2,-2*exp(x)/(3+I*3^(1/2)))/(3*I-3^(1/2))*3^(1/
2)-4/3*polylog(3,-2*exp(x)/(3+I*3^(1/2)))/(3*I-3^(1/2))*3^(1/2)+2/9*x^3*3^(
1/2)/(3*I+3^(1/2))-2/3*x^2*ln(1+2*exp(x)/(3-I*3^(1/2)))*3^(1/2)/(3*I+3^(1/2
))-4/3*x*polylog(2,-2*exp(x)/(3-I*3^(1/2)))*3^(1/2)/(3*I+3^(1/2))+4/3*polyl
og(3,-2*exp(x)/(3-I*3^(1/2)))*3^(1/2)/(3*I+3^(1/2))
```

Rubi [A]
time = 0.21, antiderivative size = 293, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 6, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {2295, 2215, 2221, 2611, 2320, 6724}

$$-\frac{4x\text{PolyLog}\left(2,-\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(\sqrt{3}+3i\right)}+\frac{4x\text{PolyLog}\left(2,-\frac{2e^x}{3+i\sqrt{3}}\right)}{\sqrt{3}\left(-\sqrt{3}+3i\right)}+\frac{4\text{PolyLog}\left(3,-\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(\sqrt{3}+3i\right)}-\frac{4\text{PolyLog}\left(3,-\frac{2e^x}{3+i\sqrt{3}}\right)}{\sqrt{3}\left(-\sqrt{3}+3i\right)}+\frac{2x^3}{3\sqrt{3}\left(\sqrt{3}+3i\right)}-\frac{2x^3}{3\sqrt{3}\left(-\sqrt{3}+3i\right)}-\frac{2x^2\log\left(1+\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(\sqrt{3}+3i\right)}+\frac{2x^2\log\left(1+\frac{2e^x}{3+i\sqrt{3}}\right)}{\sqrt{3}\left(-\sqrt{3}+3i\right)}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(3 + 3*E^x + E^(2*x)),x]
```

```
[Out] (-2*x^3)/(3*Sqrt[3]*(3*I - Sqrt[3])) + (2*x^3)/(3*Sqrt[3]*(3*I + Sqrt[3]))
- (2*x^2*Log[1 + (2*E^x)/(3 - I*Sqrt[3])])/(Sqrt[3]*(3*I + Sqrt[3])) + (2*x
^2*Log[1 + (2*E^x)/(3 + I*Sqrt[3])])/(Sqrt[3]*(3*I - Sqrt[3])) - (4*x*PolyL
og[2, (-2*E^x)/(3 - I*Sqrt[3])])/(Sqrt[3]*(3*I + Sqrt[3])) + (4*x*PolyLog[2
, (-2*E^x)/(3 + I*Sqrt[3])])/(Sqrt[3]*(3*I - Sqrt[3])) + (4*PolyLog[3, (-2*
E^x)/(3 - I*Sqrt[3])])/(Sqrt[3]*(3*I + Sqrt[3])) - (4*PolyLog[3, (-2*E^x)/(
3 + I*Sqrt[3])])/(Sqrt[3]*(3*I - Sqrt[3]))
```

Rule 2215

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[(c + d*x)^m*((F^(g*(e + f*x)))^n/(a + b*(F^(g*(e + f*x)))^n)), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
```

```
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2295

```
Int[((f_.) + (g_.)*(x_))^(m_.)/((a_.) + (b_.)*(F_)^(u_) + (c_.)*(F_)^(v_)),
 x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[(f + g*x)^m/
(b - q + 2*c*F^u), x], x] - Dist[2*(c/q), Int[(f + g*x)^m/(b + q + 2*c*F^u)
, x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v, 2*u] && LinearQ[u, x] &
& NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^2}{3+3e^x+e^{2x}}\,dx = -\frac{(2i)\int \frac{x^2}{3-i\sqrt{3}+2e^x}\,dx}{\sqrt{3}} + \frac{(2i)\int \frac{x^2}{3+i\sqrt{3}+2e^x}\,dx}{\sqrt{3}}$$

$$= -\frac{2x^3}{3\sqrt{3}\left(3i-\sqrt{3}\right)} + \frac{2x^3}{3\sqrt{3}\left(3i+\sqrt{3}\right)} + \frac{(4i)\int \frac{e^x x^2}{3-i\sqrt{3}+2e^x}\,dx}{\sqrt{3}\left(3-i\sqrt{3}\right)} - \frac{(4i)\int \frac{e^x x^2}{3+i\sqrt{3}+2e}}{\sqrt{3}\left(3+i\sqrt{3}\right.}$$

$$= -\frac{2x^3}{3\sqrt{3}\left(3i-\sqrt{3}\right)} + \frac{2x^3}{3\sqrt{3}\left(3i+\sqrt{3}\right)} - \frac{2x^2\log\left(1+\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(3i+\sqrt{3}\right)} + \frac{2x^2\log\left(1+\right.}{\sqrt{3}\left(3i-\right.}$$

$$= -\frac{2x^3}{3\sqrt{3}\left(3i-\sqrt{3}\right)} + \frac{2x^3}{3\sqrt{3}\left(3i+\sqrt{3}\right)} - \frac{2x^2\log\left(1+\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(3i+\sqrt{3}\right)} + \frac{2x^2\log\left(1+\right.}{\sqrt{3}\left(3i-\right.}$$

$$= -\frac{2x^3}{3\sqrt{3}\left(3i-\sqrt{3}\right)} + \frac{2x^3}{3\sqrt{3}\left(3i+\sqrt{3}\right)} - \frac{2x^2\log\left(1+\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(3i+\sqrt{3}\right)} + \frac{2x^2\log\left(1+\right.}{\sqrt{3}\left(3i-\right.}$$

$$= -\frac{2x^3}{3\sqrt{3}\left(3i-\sqrt{3}\right)} + \frac{2x^3}{3\sqrt{3}\left(3i+\sqrt{3}\right)} - \frac{2x^2\log\left(1+\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(3i+\sqrt{3}\right)} + \frac{2x^2\log\left(1+\right.}{\sqrt{3}\left(3i-\right.}$$

Mathematica [A]
time = 0.14, size = 216, normalized size = 0.74

$$\frac{2i\left(\frac{ix^2\log\left(1+\frac{1}{2}\left(3-i\sqrt{3}\right)e^{-x}\right)}{3i+\sqrt{3}} + \frac{ix^2\log\left(1+\frac{1}{2}\left(3+i\sqrt{3}\right)e^{-x}\right)}{-3i+\sqrt{3}} + \frac{2\left(x\text{Li}_2\left(-\frac{1}{2}i\left(-3i+\sqrt{3}\right)e^{-x}\right)+\text{Li}_3\left(-\frac{1}{2}i\left(-3i+\sqrt{3}\right)e^{-x}\right)\right)}{3+i\sqrt{3}} - \frac{2i\left(x\text{Li}_2\left(\frac{1}{2}i\left(3i+\sqrt{3}\right)e^{-x}\right)+\text{Li}_3\left(\frac{1}{2}i\left(3i+\sqrt{3}\right)e^{-x}\right)\right)}{3i+\sqrt{3}}\right)}{\sqrt{3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(3 + 3*E^x + E^(2*x)),x]
[Out] ((2*I)*((I*x^2*Log[1 + (3 - I*Sqrt[3])/(2*E^x)])/(3*I + Sqrt[3]) + (I*x^2*L
og[1 + (3 + I*Sqrt[3])/(2*E^x)])/(-3*I + Sqrt[3]) + (2*(x*PolyLog[2, ((-1/2
*I)*(-3*I + Sqrt[3]))/E^x] + PolyLog[3, ((-1/2*I)*(-3*I + Sqrt[3]))/E^x]))/
(3 + I*Sqrt[3]) - ((2*I)*(x*PolyLog[2, ((I/2)*(3*I + Sqrt[3]))/E^x] + PolyL
og[3, ((I/2)*(3*I + Sqrt[3]))/E^x]))/(3*I + Sqrt[3])))/Sqrt[3]
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{x^2}{3+3\,e^{x}+e^{2x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(3+3*exp(x)+exp(2*x)),x)
```

```
[Out] int(x^2/(3+3*exp(x)+exp(2*x)),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(3+3*exp(x)+exp(2*x)),x, algorithm="maxima")
```

```
[Out] integrate(x^2/(e^(2*x) + 3*e^x + 3), x)
```

Fricas [A]
time = 0.38, size = 150, normalized size = 0.51

$$\frac{1}{9}x^3 - \frac{1}{3}\left(-i\sqrt{3}x + x\right)\mathrm{Li}_2\left(-\frac{1}{6}\left(i\sqrt{3}+3\right)e^x\right) - \frac{1}{3}\left(i\sqrt{3}x + x\right)\mathrm{Li}_2\left(-\frac{1}{6}\left(-i\sqrt{3}+3\right)e^x\right) - \frac{1}{6}\left(-i\sqrt{3}x^2 + x^2\right)\log\left(\frac{1}{6}\left(i\sqrt{3}+3\right)e^x + 1\right) - \frac{1}{6}\left(i\sqrt{3}x^2 + x^2\right)\log\left(\frac{1}{6}\left(-i\sqrt{3}+3\right)e^x + 1\right) - \frac{1}{3}\left(-i\sqrt{3}-1\right)\mathrm{polylog}\left(3, \frac{1}{6}\left(i\sqrt{3}-3\right)e^x\right) - \frac{1}{3}\left(i\sqrt{3}-1\right)\mathrm{polylog}\left(3, \frac{1}{6}\left(-i\sqrt{3}-3\right)e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(3+3*exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/9*x^3 - 1/3*(-I*sqrt(3)*x + x)*dilog(-1/6*(I*sqrt(3) + 3)*e^x) - 1/3*(I*s
qrt(3)*x + x)*dilog(-1/6*(-I*sqrt(3) + 3)*e^x) - 1/6*(-I*sqrt(3)*x^2 + x^2)
*log(1/6*(I*sqrt(3) + 3)*e^x + 1) - 1/6*(I*sqrt(3)*x^2 + x^2)*log(1/6*(-I*s
qrt(3) + 3)*e^x + 1) - 1/3*(-I*sqrt(3) - 1)*polylog(3, 1/6*(I*sqrt(3) - 3)*
e^x) - 1/3*(I*sqrt(3) - 1)*polylog(3, 1/6*(-I*sqrt(3) - 3)*e^x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{e^{2x} + 3e^x + 3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(3+3*exp(x)+exp(2*x)),x)
```

```
[Out] Integral(x**2/(exp(2*x) + 3*exp(x) + 3), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(3+3*exp(x)+exp(2*x)),x, algorithm="giac")
[Out] integrate(x^2/(e^(2*x) + 3*e^x + 3), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2}{\mathrm{e}^{2\,x}+3\,\mathrm{e}^x+3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(exp(2*x) + 3*exp(x) + 3),x)
[Out] int(x^2/(exp(2*x) + 3*exp(x) + 3), x)
```

3.519 $\int \frac{x^2}{a+be^x+ce^{2x}}\,dx$

Optimal. Leaf size=391

$$-\frac{2cx^3}{3\left(b^2-4ac-b\sqrt{b^2-4ac}\right)}-\frac{2cx^3}{3\left(b^2-4ac+b\sqrt{b^2-4ac}\right)}+\frac{2cx^2\log\left(1+\frac{2ce^x}{b-\sqrt{b^2-4ac}}\right)}{b^2-4ac-b\sqrt{b^2-4ac}}+\frac{2cx^2\log\left(1+\right.}{b^2-4ac+}$$

```
[Out] -2/3*c*x^3/(b^2-4*a*c-b*(-4*a*c+b^2)^(1/2))+2*c*x^2*ln(1+2*c*exp(x)/(b-(-4*
a*c+b^2)^(1/2)))/(b^2-4*a*c-b*(-4*a*c+b^2)^(1/2))+4*c*x*polylog(2,-2*c*exp(
x)/(b-(-4*a*c+b^2)^(1/2)))/(b^2-4*a*c-b*(-4*a*c+b^2)^(1/2))-4*c*polylog(3,-
2*c*exp(x)/(b-(-4*a*c+b^2)^(1/2)))/(b^2-4*a*c-b*(-4*a*c+b^2)^(1/2))-2/3*c*x
^3/(b^2-4*a*c+b*(-4*a*c+b^2)^(1/2))+2*c*x^2*ln(1+2*c*exp(x)/(b+(-4*a*c+b^2)
^(1/2)))/(b^2-4*a*c+b*(-4*a*c+b^2)^(1/2))+4*c*x*polylog(2,-2*c*exp(x)/(b+(-
4*a*c+b^2)^(1/2)))/(b^2-4*a*c+b*(-4*a*c+b^2)^(1/2))-4*c*polylog(3,-2*c*exp(
x)/(b+(-4*a*c+b^2)^(1/2)))/(b^2-4*a*c+b*(-4*a*c+b^2)^(1/2))
```

Rubi [A]
time = 0.42, antiderivative size = 391, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 6, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.300$, Rules used = {2295, 2215, 2221, 2611, 2320, 6724}

$$\frac{4cx\text{PolyLog}\left(2,-\frac{2ce^x}{b-\sqrt{b^2-4ac}}\right)}{-b\sqrt{b^2-4ac}-4ac+b^2}+\frac{4cx\text{PolyLog}\left(2,-\frac{2ce^x}{\sqrt{b^2-4ac}+b}\right)}{b\sqrt{b^2-4ac}-4ac+b^2}-\frac{4c\text{PolyLog}\left(3,-\frac{2ce^x}{b-\sqrt{b^2-4ac}}\right)}{-b\sqrt{b^2-4ac}-4ac+b^2}-\frac{4c\text{PolyLog}\left(3,-\frac{2ce^x}{\sqrt{b^2-4ac}+b}\right)}{b\sqrt{b^2-4ac}-4ac+b^2}-\frac{2cx^3}{3\left(-b\sqrt{b^2-4ac}-4ac+b^2\right)}-\frac{2cx^3}{3\left(b\sqrt{b^2-4ac}-4ac+b^2\right)}+\frac{2cx^2\log\left(\frac{2ce^x}{b-\sqrt{b^2-4ac}}+1\right)}{-b\sqrt{b^2-4ac}-4ac+b^2}+\frac{2cx^2\log\left(\frac{2ce^x}{\sqrt{b^2-4ac}+b}+1\right)}{b\sqrt{b^2-4ac}-4ac+b^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(a + b*E^x + c*E^(2*x)),x]
```

```
[Out] (-2*c*x^3)/(3*(b^2 - 4*a*c - b*Sqrt[b^2 - 4*a*c])) - (2*c*x^3)/(3*(b^2 - 4*
a*c + b*Sqrt[b^2 - 4*a*c])) + (2*c*x^2*Log[1 + (2*c*E^x)/(b - Sqrt[b^2 - 4*
a*c])])/(b^2 - 4*a*c - b*Sqrt[b^2 - 4*a*c]) + (2*c*x^2*Log[1 + (2*c*E^x)/(b
 + Sqrt[b^2 - 4*a*c])])/(b^2 - 4*a*c + b*Sqrt[b^2 - 4*a*c]) + (4*c*x*PolyLo
g[2, (-2*c*E^x)/(b - Sqrt[b^2 - 4*a*c])])/(b^2 - 4*a*c - b*Sqrt[b^2 - 4*a*c
]) + (4*c*x*PolyLog[2, (-2*c*E^x)/(b + Sqrt[b^2 - 4*a*c])])/(b^2 - 4*a*c +
b*Sqrt[b^2 - 4*a*c]) - (4*c*PolyLog[3, (-2*c*E^x)/(b - Sqrt[b^2 - 4*a*c])])
/(b^2 - 4*a*c - b*Sqrt[b^2 - 4*a*c]) - (4*c*PolyLog[3, (-2*c*E^x)/(b + Sqrt
[b^2 - 4*a*c])])/(b^2 - 4*a*c + b*Sqrt[b^2 - 4*a*c])
```

Rule 2215

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[(c + d*x)^m*((F^(g*(e + f*x)))^n/(a + b*(F^(g*(e + f*x)))^n)), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2295

```
Int[((f_.) + (g_.)*(x_))^(m_.)/((a_.) + (b_.)*(F_)^(u_) + (c_.)*(F_)^(v_)),
 x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[(f + g*x)^m/
(b - q + 2*c*F^u), x], x] - Dist[2*(c/q), Int[(f + g*x)^m/(b + q + 2*c*F^u)
, x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v, 2*u] && LinearQ[u, x] &
& NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^2}{a+be^x+ce^{2x}}\,dx = \frac{(2c)\int \frac{x^2}{b-\sqrt{b^2-4ac}+2ce^x}\,dx}{\sqrt{b^2-4ac}} - \frac{(2c)\int \frac{x^2}{b+\sqrt{b^2-4ac}+2ce^x}\,dx}{\sqrt{b^2-4ac}}$$

$$= -\frac{2cx^3}{3\left(b^2-4ac-b\sqrt{b^2-4ac}\right)} - \frac{2cx^3}{3\left(b^2-4ac+b\sqrt{b^2-4ac}\right)} + \frac{(4c^2)\int \frac{e^x x^2}{b-\sqrt{b^2-4ac}\ldots}}{b^2-4ac-b\sqrt{b^2-\ldots}}$$

$$= -\frac{2cx^3}{3\left(b^2-4ac-b\sqrt{b^2-4ac}\right)} - \frac{2cx^3}{3\left(b^2-4ac+b\sqrt{b^2-4ac}\right)} + \frac{2cx^2\log\left(1+\frac{2\ldots}{b-\sqrt{b^2\ldots}}\right.}{b^2-4ac-b\sqrt{b^2\ldots}}$$

$$= -\frac{2cx^3}{3\left(b^2-4ac-b\sqrt{b^2-4ac}\right)} - \frac{2cx^3}{3\left(b^2-4ac+b\sqrt{b^2-4ac}\right)} + \frac{2cx^2\log\left(1+\frac{2\ldots}{b-\sqrt{b^2\ldots}}\right.}{b^2-4ac-b\sqrt{b^2\ldots}}$$

$$= -\frac{2cx^3}{3\left(b^2-4ac-b\sqrt{b^2-4ac}\right)} - \frac{2cx^3}{3\left(b^2-4ac+b\sqrt{b^2-4ac}\right)} + \frac{2cx^2\log\left(1+\frac{2\ldots}{b-\sqrt{b^2\ldots}}\right.}{b^2-4ac-b\sqrt{b^2\ldots}}$$

$$= -\frac{2cx^3}{3\left(b^2-4ac-b\sqrt{b^2-4ac}\right)} - \frac{2cx^3}{3\left(b^2-4ac+b\sqrt{b^2-4ac}\right)} + \frac{2cx^2\log\left(1+\frac{2\ldots}{b-\sqrt{b^2\ldots}}\right.}{b^2-4ac-b\sqrt{b^2\ldots}}$$

Mathematica [A]
time = 0.16, size = 407, normalized size = 1.04

$$\frac{2\sqrt{b^2-4ac}\,x^3-3bx^2\log\left(1+\frac{2ce^x}{b-\sqrt{b^2-4ac}}\right)-3\sqrt{b^2-4ac}\,x^2\log\left(1+\frac{2ce^x}{b-\sqrt{b^2-4ac}}\right)+3bx^2\log\left(1+\frac{2ce^x}{b+\sqrt{b^2-4ac}}\right)-3\sqrt{b^2-4ac}\,x^2\log\left(1+\frac{2ce^x}{b+\sqrt{b^2-4ac}}\right)-6\left(b+\sqrt{b^2-4ac}\right)x\,\mathrm{Li}_2\left(\frac{2ce^x}{-b+\sqrt{b^2-4ac}}\right)+6\left(b-\sqrt{b^2-4ac}\right)x\,\mathrm{Li}_2\left(-\frac{2ce^x}{b+\sqrt{b^2-4ac}}\right)+6b\,\mathrm{Li}_3\left(\frac{2ce^x}{-b+\sqrt{b^2-4ac}}\right)+6\sqrt{b^2-4ac}\,\mathrm{Li}_3\left(\frac{2ce^x}{-b+\sqrt{b^2-4ac}}\right)-6b\,\mathrm{Li}_3\left(-\frac{2ce^x}{b+\sqrt{b^2-4ac}}\right)+6\sqrt{b^2-4ac}\,\mathrm{Li}_3\left(-\frac{2ce^x}{b+\sqrt{b^2-4ac}}\right)}{6a\sqrt{b^2-4ac}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(a + b*E^x + c*E^(2*x)),x]
```

```
[Out] (2*Sqrt[b^2 - 4*a*c]*x^3 - 3*b*x^2*Log[1 + (2*c*E^x)/(b - Sqrt[b^2 - 4*a*c]
)] - 3*Sqrt[b^2 - 4*a*c]*x^2*Log[1 + (2*c*E^x)/(b - Sqrt[b^2 - 4*a*c])] + 3
*b*x^2*Log[1 + (2*c*E^x)/(b + Sqrt[b^2 - 4*a*c])] - 3*Sqrt[b^2 - 4*a*c]*x^2
*Log[1 + (2*c*E^x)/(b + Sqrt[b^2 - 4*a*c])] - 6*(b + Sqrt[b^2 - 4*a*c])*x*P
olyLog[2, (2*c*E^x)/(-b + Sqrt[b^2 - 4*a*c])] + 6*(b - Sqrt[b^2 - 4*a*c])*x
*PolyLog[2, (-2*c*E^x)/(b + Sqrt[b^2 - 4*a*c])] + 6*b*PolyLog[3, (2*c*E^x)/
(-b + Sqrt[b^2 - 4*a*c])] + 6*Sqrt[b^2 - 4*a*c]*PolyLog[3, (2*c*E^x)/(-b +
Sqrt[b^2 - 4*a*c])] - 6*b*PolyLog[3, (-2*c*E^x)/(b + Sqrt[b^2 - 4*a*c])] +
6*Sqrt[b^2 - 4*a*c]*PolyLog[3, (-2*c*E^x)/(b + Sqrt[b^2 - 4*a*c])])/(6*a*Sq
rt[b^2 - 4*a*c])
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{x^2}{a + b\,\mathrm{e}^{x} + c\,\mathrm{e}^{2x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a+b*exp(x)+c*exp(2*x)),x)
```

```
[Out] int(x^2/(a+b*exp(x)+c*exp(2*x)),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*exp(x)+c*exp(2*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re deta
```

Fricas [A]
time = 0.37, size = 415, normalized size = 1.06

$$\frac{2\,(b^2-4\,ac)x^3-6\left(abx\sqrt{\frac{b^2-4\,ac}{a^2}}+(b^2-4\,ac)x\right)\mathrm{Li}_2\left(-\frac{a\sqrt{\frac{b^2-4\,ac}{a^2}}\,e^x+be^x+2\,a}{2\,a}+1\right)+6\left(abx\sqrt{\frac{b^2-4\,ac}{a^2}}-(b^2-4\,ac)x\right)\mathrm{Li}_2\left(\frac{a\sqrt{\frac{b^2-4\,ac}{a^2}}\,e^x-be^x-2\,a}{2\,a}+1\right)-3\left(abx^2\sqrt{\frac{b^2-4\,ac}{a^2}}+(b^2-4\,ac)x^2\right)\log\left(\frac{a\sqrt{\frac{b^2-4\,ac}{a^2}}\,e^x+be^x+2\,a}{2\,a}\right)+3\left(abx^2\sqrt{\frac{b^2-4\,ac}{a^2}}-(b^2-4\,ac)x^2\right)\log\left(-\frac{a\sqrt{\frac{b^2-4\,ac}{a^2}}\,e^x-be^x-2\,a}{2\,a}\right)+6\left(ab\sqrt{\frac{b^2-4\,ac}{a^2}}+b^2-4\,ac\right)\mathrm{polylog}\left(3,-\frac{a\sqrt{\frac{b^2-4\,ac}{a^2}}\,e^x+be^x}{2\,a}\right)-6\left(ab\sqrt{\frac{b^2-4\,ac}{a^2}}-b^2+4\,ac\right)\mathrm{polylog}\left(3,\frac{a\sqrt{\frac{b^2-4\,ac}{a^2}}\,e^x-be^x}{2\,a}\right)}{6\,(ab^2-4\,a^2c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*exp(x)+c*exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/6*(2*(b^2 - 4*a*c)*x^3 - 6*(a*b*x*sqrt((b^2 - 4*a*c)/a^2) + (b^2 - 4*a*c)
*x)*dilog(-1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^x + b*e^x + 2*a)/a + 1) + 6*(a*
b*x*sqrt((b^2 - 4*a*c)/a^2) - (b^2 - 4*a*c)*x)*dilog(1/2*(a*sqrt((b^2 - 4*a
*c)/a^2)*e^x - b*e^x - 2*a)/a + 1) - 3*(a*b*x^2*sqrt((b^2 - 4*a*c)/a^2) + (
b^2 - 4*a*c)*x^2)*log(1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^x + b*e^x + 2*a)/a)
+ 3*(a*b*x^2*sqrt((b^2 - 4*a*c)/a^2) - (b^2 - 4*a*c)*x^2)*log(-1/2*(a*sqrt(
(b^2 - 4*a*c)/a^2)*e^x - b*e^x - 2*a)/a) + 6*(a*b*sqrt((b^2 - 4*a*c)/a^2) +
 b^2 - 4*a*c)*polylog(3, -1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^x + b*e^x)/a) -
6*(a*b*sqrt((b^2 - 4*a*c)/a^2) - b^2 + 4*a*c)*polylog(3, 1/2*(a*sqrt((b^2 -
 4*a*c)/a^2)*e^x - b*e^x)/a))/(a*b^2 - 4*a^2*c)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{a + be^{x} + ce^{2x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a+b*exp(x)+c*exp(2*x)),x)
```

```
[Out] Integral(x**2/(a + b*exp(x) + c*exp(2*x)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*exp(x)+c*exp(2*x)),x, algorithm="giac")
```

```
[Out] integrate(x^2/(c*e^(2*x) + b*e^x + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2}{a+b\,\mathrm{e}^x+c\,\mathrm{e}^{2\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a + b*exp(x) + c*exp(2*x)),x)
```

```
[Out] int(x^2/(a + b*exp(x) + c*exp(2*x)), x)
```

3.520 $\int \frac{1}{1+2f^{c+dx}+f^{2c+2dx}}\,dx$

Optimal. Leaf size=40

$$x+\frac{1}{d\left(1+f^{c+dx}\right)\log(f)}-\frac{\log\left(1+f^{c+dx}\right)}{d\log(f)}$$

```
[Out] x+1/d/(1+f^(d*x+c))/ln(f)-ln(1+f^(d*x+c))/d/ln(f)
```

Rubi [A]
time = 0.02, antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {2320, 46}

$$-\frac{\log\left(f^{c+dx}+1\right)}{d\log(f)}+\frac{1}{d\log(f)\left(f^{c+dx}+1\right)}+x$$

Antiderivative was successfully verified.

```
[In] Int[(1 + 2*f^(c + d*x) + f^(2*c + 2*d*x))^(-1),x]
```

```
[Out] x + 1/(d*(1 + f^(c + d*x))*Log[f]) - Log[1 + f^(c + d*x)]/(d*Log[f])
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{1}{1+2f^{c+dx}+f^{2c+2dx}}\,dx = \frac{\text{Subst}\left(\int \frac{1}{x(1+x)^2}\,dx, x, f^{c+dx}\right)}{d\log(f)}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{1}{-1-x}+\frac{1}{x}-\frac{1}{(1+x)^2}\right)\,dx, x, f^{c+dx}\right)}{d\log(f)}$$
$$= x+\frac{1}{d\left(1+f^{c+dx}\right)\log(f)}-\frac{\log\left(1+f^{c+dx}\right)}{d\log(f)}$$

Mathematica [A]
time = 0.06, size = 44, normalized size = 1.10

$$\frac{\frac{1}{1+f^{c+dx}}+\log\left(f^{c+dx}\right)-\log\left(d\left(1+f^{c+dx}\right)\log(f)\right)}{d\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 + 2*f^(c + d*x) + f^(2*c + 2*d*x))^(-1),x]
[Out] ((1 + f^(c + d*x))^(-1) + Log[f^(c + d*x)] - Log[d*(1 + f^(c + d*x))*Log[f]
])/(d*Log[f])
```

Maple [A]
time = 0.03, size = 46, normalized size = 1.15

method	result	size
risch	$x+\frac{c}{d}+\frac{1}{d\left(1+f^{dx+c}\right)\ln(f)}-\frac{\ln\left(1+f^{dx+c}\right)}{d\ln(f)}$	46
norman	$\frac{x+x\,\mathrm{e}^{(dx+c)\ln(f)}+\frac{1}{d\ln(f)}}{\mathrm{e}^{(dx+c)\ln(f)}+1}-\frac{\ln\left(\mathrm{e}^{(dx+c)\ln(f)}+1\right)}{d\ln(f)}$	58

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(1+2*f^(d*x+c)+f^(2*d*x+2*c)),x,method=_RETURNVERBOSE)
[Out] x+1/d*c+1/d/(1+f^(d*x+c))/ln(f)-ln(1+f^(d*x+c))/d/ln(f)
```

Maxima [A]
time = 0.28, size = 48, normalized size = 1.20

$$\frac{dx+c}{d}-\frac{\log\left(f^{dx+c}+1\right)}{d\log\left(f\right)}+\frac{1}{d(f^{dx+c}+1)\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1+2*f^(d*x+c)+f^(2*d*x+2*c)),x, algorithm="maxima")
```

```
[Out] (d*x + c)/d - log(f^(d*x + c) + 1)/(d*log(f)) + 1/(d*(f^(d*x + c) + 1)*log(
f))
```

Fricas [A]
time = 0.38, size = 59, normalized size = 1.48

$$\frac{df^{dx+c}x\log(f)+dx\log(f)-(f^{dx+c}+1)\log(f^{dx+c}+1)+1}{df^{dx+c}\log(f)+d\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1+2*f^(d*x+c)+f^(2*d*x+2*c)),x, algorithm="fricas")
```

```
[Out] (d*f^(d*x + c)*x*log(f) + d*x*log(f) - (f^(d*x + c) + 1)*log(f^(d*x + c) +
1) + 1)/(d*f^(d*x + c)*log(f) + d*log(f))
```

Sympy [A]
time = 0.05, size = 34, normalized size = 0.85

$$x+\frac{1}{df^{c+dx}\log(f)+d\log(f)}-\frac{\log(f^{c+dx}+1)}{d\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1+2*f**(d*x+c)+f**(2*d*x+2*c)),x)
```

```
[Out] x + 1/(d*f**(c + d*x)*log(f) + d*log(f)) - log(f**(c + d*x) + 1)/(d*log(f))
```

Giac [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1+2*f^(d*x+c)+f^(2*d*x+2*c)),x, algorithm="giac")
```

```
[Out] Exception raised: NotImplementedError >> Unable to parse Giac output: Undef
/Unsigned Inf encountered in limitUndef/Unsigned Inf encountered in limitUn
def/Unsigned Inf encountered in limit(1/ln(sageVARf)*ln(abs(sageVARf)^sageV
ARc*abs(sageVARf
```

Mupad [B]
time = 3.52, size = 50, normalized size = 1.25

$$\frac{1}{d\,\ln(f)\,(f^{d\,x}\,f^c+1)}-\frac{\ln(f^{d\,x}\,f^c+1)-d\,x\,\ln(f)}{d\,\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(f^(2*c + 2*d*x) + 2*f^(c + d*x) + 1),x)
```

```
[Out] 1/(d*log(f)*(f^(d*x)*f^c + 1)) - (log(f^(d*x)*f^c + 1) - d*x*log(f))/(d*log
(f))
```

3.521 $\int \frac{1}{a+bf^{c+dx}+cf^{2c+2dx}}\,dx$

Optimal. Leaf size=94

$$\frac{x}{a}+\frac{b\tanh^{-1}\left(\frac{b+2cf^{c+dx}}{\sqrt{b^2-4ac}}\right)}{a\sqrt{b^2-4ac}\,d\log(f)}-\frac{\log\left(a+bf^{c+dx}+cf^{2c+2dx}\right)}{2ad\log(f)}$$

```
[Out] x/a-1/2*ln(a+b*f^(d*x+c)+c*f^(2*d*x+2*c))/a/d/ln(f)+b*arctanh((b+2*c*f^(d*x
+c))/(-4*a*c+b^2)^(1/2))/a/d/ln(f)/(-4*a*c+b^2)^(1/2)
```

Rubi [A]
time = 0.06, antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.280$, Rules used = {2320, 719, 29, 648, 632, 212, 642}

$$\frac{b\tanh^{-1}\left(\frac{b+2cf^{c+dx}}{\sqrt{b^2-4ac}}\right)}{ad\log(f)\sqrt{b^2-4ac}}-\frac{\log\left(a+bf^{c+dx}+cf^{2c+2dx}\right)}{2ad\log(f)}+\frac{x}{a}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x))^(-1),x]
```

```
[Out] x/a + (b*ArcTanh[(b + 2*c*f^(c + d*x))/Sqrt[b^2 - 4*a*c]])/(a*Sqrt[b^2 - 4*
a*c]*d*Log[f]) - Log[a + b*f^(c + d*x) + c*f^(2*c + 2*d*x)]/(2*a*d*Log[f])
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 632

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 642

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[d*(Log[RemoveContent[a + b*x + c*x^2, x]]/b), x] /; FreeQ[{a, b, c, d,
```

```
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 648

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 719

```
Int[1/(((d_.) + (e_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)), x_Symbol]
 :> Dist[e^2/(c*d^2 - b*d*e + a*e^2), Int[1/(d + e*x), x], x] + Dist[1/(c*d
^2 - b*d*e + a*e^2), Int[(c*d - b*e - c*e*x)/(a + b*x + c*x^2), x], x] /; F
reeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^
2, 0] && NeQ[2*c*d - b*e, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$
\begin{aligned}
\int \frac{1}{a+bf^{c+dx}+cf^{2c+2dx}}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{x(a+bx+cx^2)}\,dx, x, f^{c+dx}\right)}{d\log(f)} \\
&= \frac{\text{Subst}\left(\int \frac{1}{x}\,dx, x, f^{c+dx}\right)}{ad\log(f)} + \frac{\text{Subst}\left(\int \frac{-b-cx}{a+bx+cx^2}\,dx, x, f^{c+dx}\right)}{ad\log(f)} \\
&= \frac{x}{a} - \frac{\text{Subst}\left(\int \frac{b+2cx}{a+bx+cx^2}\,dx, x, f^{c+dx}\right)}{2ad\log(f)} - \frac{b\text{Subst}\left(\int \frac{1}{a+bx+cx^2}\,dx, x, f^{c+dx}\right)}{2ad\log(f)} \\
&= \frac{x}{a} - \frac{\log\left(a+bf^{c+dx}+cf^{2c+2dx}\right)}{2ad\log(f)} + \frac{b\text{Subst}\left(\int \frac{1}{b^2-4ac-x^2}\,dx, x, b+2cf^{c+dx}\right)}{ad\log(f)} \\
&= \frac{x}{a} + \frac{b\tanh^{-1}\left(\frac{b+2cf^{c+dx}}{\sqrt{b^2-4ac}}\right)}{a\sqrt{b^2-4ac}\,d\log(f)} - \frac{\log\left(a+bf^{c+dx}+cf^{2c+2dx}\right)}{2ad\log(f)}
\end{aligned}
$$

Mathematica [A]

time = 0.15, size = 92, normalized size = 0.98

$$-\frac{\frac{2b\tan^{-1}\left(\frac{b+2cf^{c+dx}}{\sqrt{-b^2+4ac}}\right)}{\sqrt{-b^2+4ac}}-2\log\left(f^{c+dx}\right)+\log\left(a+f^{c+dx}\left(b+cf^{c+dx}\right)\right)}{2ad\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x))^(-1),x]
```

```
[Out] -1/2*((2*b*ArcTan[(b + 2*c*f^(c + d*x))/Sqrt[-b^2 + 4*a*c]])/Sqrt[-b^2 + 4*
a*c] - 2*Log[f^(c + d*x)] + Log[a + f^(c + d*x)*(b + c*f^(c + d*x))])/(a*d*
Log[f])
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 546 vs. $2(88) = 176$.
time = 0.06, size = 547, normalized size = 5.82

method	result
risch	$\frac{4\ln(f)^2acd^2x}{4\ln(f)^2a^2cd^2-\ln(f)^2ab^2d^2}-\frac{\ln(f)^2b^2d^2x}{4\ln(f)^2a^2cd^2-\ln(f)^2ab^2d^2}+\frac{4\ln(f)^2ac^2d}{4\ln(f)^2a^2cd^2-\ln(f)^2ab^2d^2}-\frac{\ln(f)^2b^2cd}{4\ln(f)^2a^2cd^2-\ln(f)^2ab^2d^2}-$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x,method=_RETURNVERBOSE)
```

```
[Out] 4/(4*ln(f)^2*a^2*c*d^2-ln(f)^2*a*b^2*d^2)*ln(f)^2*a*c*d^2*x-1/(4*ln(f)^2*a^
2*c*d^2-ln(f)^2*a*b^2*d^2)*ln(f)^2*b^2*d^2*x+4/(4*ln(f)^2*a^2*c*d^2-ln(f)^2
*a*b^2*d^2)*ln(f)^2*a*c^2*d-1/(4*ln(f)^2*a^2*c*d^2-ln(f)^2*a*b^2*d^2)*ln(f)
^2*b^2*c*d-2/(4*a*c-b^2)/d/ln(f)*ln(f^(d*x+c)-1/2*(-b^2+(-4*a*b^2*c+b^4)^(1
/2))/c/b)*c+1/2/a/(4*a*c-b^2)/d/ln(f)*ln(f^(d*x+c)-1/2*(-b^2+(-4*a*b^2*c+b^
4)^(1/2))/c/b)*b^2+1/2/a/(4*a*c-b^2)/d/ln(f)*ln(f^(d*x+c)-1/2*(-b^2+(-4*a*b
^2*c+b^4)^(1/2))/c/b)*(-4*a*b^2*c+b^4)^(1/2)-2/(4*a*c-b^2)/d/ln(f)*ln(f^(d*
x+c)+1/2*(b^2+(-4*a*b^2*c+b^4)^(1/2))/c/b)*c+1/2/a/(4*a*c-b^2)/d/ln(f)*ln(f
^(d*x+c)+1/2*(b^2+(-4*a*b^2*c+b^4)^(1/2))/c/b)*b^2-1/2/a/(4*a*c-b^2)/d/ln(f
)*ln(f^(d*x+c)+1/2*(b^2+(-4*a*b^2*c+b^4)^(1/2))/c/b)*(-4*a*b^2*c+b^4)^(1/2)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x, algorithm="maxima")
```

[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re deta

Fricas [A]
time = 0.39, size = 309, normalized size = 3.29

$$\left[\frac{2\,(b^2-4\,ac)dx\log(f)+\sqrt{b^2-4\,ac}\,b\log\left(\frac{2\,c^2f^{2\,dx+2\,c}+b^2-2\,ac+2\,\left(bc+\sqrt{b^2-4\,ac}\,c\right)f^{dx+c}+\sqrt{b^2-4\,ac}\,b}{cf^{2\,dx+2\,c}+bf^{dx+c}+a}\right)-(b^2-4\,ac)\log\left(cf^{2\,dx+2\,c}+bf^{dx+c}+a\right)}{2\,(ab^2-4\,a^2c)d\log(f)}, \frac{2\,(b^2-4\,ac)dx\log(f)+2\,\sqrt{-b^2+4\,ac}\,b\arctan\left(-\frac{2\,\sqrt{-b^2+4\,ac}\,cf^{dx+c}+\sqrt{-b^2+4\,ac}\,b}{b^2-4\,ac}\right)-(b^2-4\,ac)\log\left(cf^{2\,dx+2\,c}+bf^{dx+c}+a\right)}{2\,(ab^2-4\,a^2c)d\log(f)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x, algorithm="fricas")

[Out] [1/2*(2*(b^2 - 4*a*c)*d*x*log(f) + sqrt(b^2 - 4*a*c)*b*log((2*c^2*f^(2*d*x
+ 2*c) + b^2 - 2*a*c + 2*(b*c + sqrt(b^2 - 4*a*c)*c)*f^(d*x + c) + sqrt(b^2
 - 4*a*c)*b)/(c*f^(2*d*x + 2*c) + b*f^(d*x + c) + a)) - (b^2 - 4*a*c)*log(c
*f^(2*d*x + 2*c) + b*f^(d*x + c) + a))/((a*b^2 - 4*a^2*c)*d*log(f)), 1/2*(2
*(b^2 - 4*a*c)*d*x*log(f) + 2*sqrt(-b^2 + 4*a*c)*b*arctan(-(2*sqrt(-b^2 + 4
*a*c)*c*f^(d*x + c) + sqrt(-b^2 + 4*a*c)*b)/(b^2 - 4*a*c)) - (b^2 - 4*a*c)*
log(c*f^(2*d*x + 2*c) + b*f^(d*x + c) + a))/((a*b^2 - 4*a^2*c)*d*log(f))]

Sympy [A]
time = 0.24, size = 104, normalized size = 1.11

$$\operatorname{RootSum}\left(z^2\cdot\left(4a^2cd^2\log(f)^2-ab^2d^2\log(f)^2\right)+z\left(4acd\log(f)-b^2d\log(f)\right)+c,\left(i\mapsto i\log\left(f^{c+dx}+\frac{-4ia^2cd\log(f)+iab^2d\log(f)-2ac+b^2}{bc}\right)\right)\right)+\frac{x}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a+b*f**(d*x+c)+c*f**(2*d*x+2*c)),x)

[Out] RootSum(_z**2*(4*a**2*c*d**2*log(f)**2 - a*b**2*d**2*log(f)**2) + _z*(4*a*c
*d*log(f) - b**2*d*log(f)) + c, Lambda(_i, _i*log(f**(c + d*x) + (-4*_i*a**
2*c*d*log(f) + _i*a*b**2*d*log(f) - 2*a*c + b**2)/(b*c)))) + x/a

Giac [A]
time = 5.49, size = 110, normalized size = 1.17

$$-\frac{\frac{2\,b\arctan\left(\frac{2\,cf^{dx}f^{c}+b}{\sqrt{-b^2+4\,ac}}\right)}{\sqrt{-b^2+4\,ac}\,a\log(f)}+\frac{\log\left(cf^{2\,dx}f^{2\,c}+bf^{dx}f^{c}+a\right)}{a\log(f)}-\frac{2\,\log\left(|f|^{dx}|f|^{c}\right)}{a\log(f)}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x, algorithm="giac")

[Out] -1/2*(2*b*arctan((2*c*f^(d*x)*f^c + b)/sqrt(-b^2 + 4*a*c))/(sqrt(-b^2 + 4*a
*c)*a*log(f)) + log(c*f^(2*d*x)*f^(2*c) + b*f^(d*x)*f^c + a)/(a*log(f)) - 2
*log(abs(f)^(d*x)*abs(f)^c)/(a*log(f)))/d

Mupad [B]
time = 3.67, size = 96, normalized size = 1.02

$$\frac{x}{a}-\frac{\ln\left(a+c\,f^{2\,d\,x}\,f^{2\,c}+b\,f^{d\,x}\,f^c\right)}{2\,a\,d\,\ln\left(f\right)}-\frac{b\,\mathrm{atan}\left(\frac{b+2\,c\,f^{d\,x}\,f^c}{\sqrt{4\,a\,c-b^2}}\right)}{a\,d\,\ln\left(f\right)\,\sqrt{4\,a\,c-b^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x)),x)
```

```
[Out] x/a - log(a + c*f^(2*d*x)*f^(2*c) + b*f^(d*x)*f^c)/(2*a*d*log(f)) - (b*atan
((b + 2*c*f^(d*x)*f^c)/(4*a*c - b^2)^(1/2)))/(a*d*log(f)*(4*a*c - b^2)^(1/2
))
```

3.522 $\int \frac{1}{a+bf^{g+hx}+cf^{2(g+hx)}}\,dx$

Optimal. Leaf size=94

$$\frac{x}{a}+\frac{b\tanh^{-1}\left(\frac{b+2cf^{g+hx}}{\sqrt{b^2-4ac}}\right)}{a\sqrt{b^2-4ac}\,h\log(f)}-\frac{\log\left(a+bf^{g+hx}+cf^{2g+2hx}\right)}{2ah\log(f)}$$

```
[Out] x/a-1/2*ln(a+b*f^(h*x+g)+c*f^(2*h*x+2*g))/a/h/ln(f)+b*arctanh((b+2*c*f^(h*x
+g))/(-4*a*c+b^2)^(1/2))/a/h/ln(f)/(-4*a*c+b^2)^(1/2)
```

Rubi [A]
time = 0.06, antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.292$, Rules used = {2320, 719, 29, 648, 632, 212, 642}

$$\frac{b\tanh^{-1}\left(\frac{b+2cf^{g+hx}}{\sqrt{b^2-4ac}}\right)}{ah\log(f)\sqrt{b^2-4ac}}-\frac{\log\left(a+bf^{g+hx}+cf^{2g+2hx}\right)}{2ah\log(f)}+\frac{x}{a}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*f^(g + h*x) + c*f^(2*(g + h*x)))^(-1),x]
```

```
[Out] x/a + (b*ArcTanh[(b + 2*c*f^(g + h*x))/Sqrt[b^2 - 4*a*c]])/(a*Sqrt[b^2 - 4*
a*c]*h*Log[f]) - Log[a + b*f^(g + h*x) + c*f^(2*g + 2*h*x)]/(2*a*h*Log[f])
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 632

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 642

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[d*(Log[RemoveContent[a + b*x + c*x^2, x]]/b), x] /; FreeQ[{a, b, c, d,
```

```
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 648

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 719

```
Int[1/(((d_.) + (e_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)), x_Symbol]
 :> Dist[e^2/(c*d^2 - b*d*e + a*e^2), Int[1/(d + e*x), x], x] + Dist[1/(c*d
^2 - b*d*e + a*e^2), Int[(c*d - b*e - c*e*x)/(a + b*x + c*x^2), x], x] /; F
reeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^
2, 0] && NeQ[2*c*d - b*e, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{a+bf^{g+hx}+cf^{2(g+hx)}}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{x(a+bx+cx^2)}\,dx,x,f^{g+hx}\right)}{h\log(f)}\\
&= \frac{\text{Subst}\left(\int \frac{1}{x}\,dx,x,f^{g+hx}\right)}{ah\log(f)}+\frac{\text{Subst}\left(\int \frac{-b-cx}{a+bx+cx^2}\,dx,x,f^{g+hx}\right)}{ah\log(f)}\\
&= \frac{x}{a}-\frac{\text{Subst}\left(\int \frac{b+2cx}{a+bx+cx^2}\,dx,x,f^{g+hx}\right)}{2ah\log(f)}-\frac{b\text{Subst}\left(\int \frac{1}{a+bx+cx^2}\,dx,x,f^{g+hx}\right)}{2ah\log(f)}\\
&= \frac{x}{a}-\frac{\log\left(a+bf^{g+hx}+cf^{2g+2hx}\right)}{2ah\log(f)}+\frac{b\text{Subst}\left(\int \frac{1}{b^2-4ac-x^2}\,dx,x,b+2cf^{g+hx}\right)}{ah\log(f)}\\
&= \frac{x}{a}+\frac{b\tanh^{-1}\left(\frac{b+2cf^{g+hx}}{\sqrt{b^2-4ac}}\right)}{a\sqrt{b^2-4ac}\,h\log(f)}-\frac{\log\left(a+bf^{g+hx}+cf^{2g+2hx}\right)}{2ah\log(f)}
\end{aligned}$$

Mathematica [A]

time = 0.15, size = 92, normalized size = 0.98

$$-\frac{\frac{2b\tan^{-1}\left(\frac{b+2cf^{g+hx}}{\sqrt{-b^2+4ac}}\right)}{\sqrt{-b^2+4ac}}-2\log\left(f^{g+hx}\right)+\log\left(a+f^{g+hx}\left(b+cf^{g+hx}\right)\right)}{2ah\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*f^(g + h*x) + c*f^(2*(g + h*x)))^(-1),x]
```

```
[Out] -1/2*((2*b*ArcTan[(b + 2*c*f^(g + h*x))/Sqrt[-b^2 + 4*a*c]])/Sqrt[-b^2 + 4*
a*c] - 2*Log[f^(g + h*x)] + Log[a + f^(g + h*x)*(b + c*f^(g + h*x))])/(a*h*
Log[f])
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 545 vs. $2(88) = 176$.
time = 0.07, size = 546, normalized size = 5.81

method	result
risch	$\frac{4\ln(f)^2ach^2x}{4\ln(f)^2a^2ch^2-\ln(f)^2ab^2h^2}-\frac{\ln(f)^2b^2h^2x}{4\ln(f)^2a^2ch^2-\ln(f)^2ab^2h^2}+\frac{4\ln(f)^2acgh}{4\ln(f)^2a^2ch^2-\ln(f)^2ab^2h^2}-\frac{\ln(f)^2b^2gh}{4\ln(f)^2a^2ch^2-\ln(f)^2ab^2h^2}-$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*f^(h*x+g)+c*f^(2*h*x+2*g)),x,method=_RETURNVERBOSE)
```

```
[Out] 4/(4*ln(f)^2*a^2*c*h^2-ln(f)^2*a*b^2*h^2)*ln(f)^2*a*c*h^2*x-1/(4*ln(f)^2*a^
2*c*h^2-ln(f)^2*a*b^2*h^2)*ln(f)^2*b^2*h^2*x+4/(4*ln(f)^2*a^2*c*h^2-ln(f)^2
*a*b^2*h^2)*ln(f)^2*a*c*g*h-1/(4*ln(f)^2*a^2*c*h^2-ln(f)^2*a*b^2*h^2)*ln(f)
^2*b^2*g*h-2/(4*a*c-b^2)/h/ln(f)*ln(f^(h*x+g)-1/2*(-b^2+(-4*a*b^2*c+b^4)^(1
/2))/c/b)*c+1/2/a/(4*a*c-b^2)/h/ln(f)*ln(f^(h*x+g)-1/2*(-b^2+(-4*a*b^2*c+b^
4)^(1/2))/c/b)*b^2+1/2/a/(4*a*c-b^2)/h/ln(f)*ln(f^(h*x+g)-1/2*(-b^2+(-4*a*b
^2*c+b^4)^(1/2))/c/b)*(-4*a*b^2*c+b^4)^(1/2)-2/(4*a*c-b^2)/h/ln(f)*ln(f^(h*
x+g)+1/2*(b^2+(-4*a*b^2*c+b^4)^(1/2))/c/b)*c+1/2/a/(4*a*c-b^2)/h/ln(f)*ln(f
^(h*x+g)+1/2*(b^2+(-4*a*b^2*c+b^4)^(1/2))/c/b)*b^2-1/2/a/(4*a*c-b^2)/h/ln(f
)*ln(f^(h*x+g)+1/2*(b^2+(-4*a*b^2*c+b^4)^(1/2))/c/b)*(-4*a*b^2*c+b^4)^(1/2)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*f^(h*x+g)+c*f^(2*h*x+2*g)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re deta
```

Fricas [A]
time = 0.38, size = 309, normalized size = 3.29

$$\left[\frac{2\,(b^2-4\,ac)hx\log\left(f\right)+\sqrt{b^2-4\,ac}\,b\log\left(\frac{2\,c^2f^{2\,hx+2\,g}+b^2-2\,ac+2\,\left(bc+\sqrt{b^2-4\,ac}\,c\right)f^{hx+g}+\sqrt{b^2-4\,ac}\,b}{cf^{2\,hx+2\,g}+bf^{hx+g}+a}\right)-(b^2-4\,ac)\log\left(cf^{2\,hx+2\,g}+bf^{hx+g}+a\right)}{2\,(ab^2-4\,a^2c)h\log\left(f\right)}, \frac{2\,(b^2-4\,ac)hx\log\left(f\right)+2\,\sqrt{-b^2+4\,ac}\,b\arctan\left(-\frac{2\,\sqrt{-b^2+4\,ac}\,cf^{hx+g}+\sqrt{-b^2+4\,ac}\,b}{b^2-4\,ac}\right)-(b^2-4\,ac)\log\left(cf^{2\,hx+2\,g}+bf^{hx+g}+a\right)}{2\,(ab^2-4\,a^2c)h\log\left(f\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*f^(h*x+g)+c*f^(2*h*x+2*g)),x, algorithm="fricas")
```

```
[Out] [1/2*(2*(b^2 - 4*a*c)*h*x*log(f) + sqrt(b^2 - 4*a*c)*b*log((2*c^2*f^(2*h*x
+ 2*g) + b^2 - 2*a*c + 2*(b*c + sqrt(b^2 - 4*a*c)*c)*f^(h*x + g) + sqrt(b^2
 - 4*a*c)*b)/(c*f^(2*h*x + 2*g) + b*f^(h*x + g) + a)) - (b^2 - 4*a*c)*log(c
*f^(2*h*x + 2*g) + b*f^(h*x + g) + a))/((a*b^2 - 4*a^2*c)*h*log(f)), 1/2*(2
*(b^2 - 4*a*c)*h*x*log(f) + 2*sqrt(-b^2 + 4*a*c)*b*arctan(-(2*sqrt(-b^2 + 4
*a*c)*c*f^(h*x + g) + sqrt(-b^2 + 4*a*c)*b)/(b^2 - 4*a*c)) - (b^2 - 4*a*c)*
log(c*f^(2*h*x + 2*g) + b*f^(h*x + g) + a))/((a*b^2 - 4*a^2*c)*h*log(f))]
```

Sympy [A]
time = 0.24, size = 104, normalized size = 1.11

$$\operatorname{RootSum}\left(z^2\cdot\left(4a^2ch^2\log\left(f\right)^2-ab^2h^2\log\left(f\right)^2\right)+z\left(4ach\log\left(f\right)-b^2h\log\left(f\right)\right)+c,\left(i\mapsto i\log\left(f^{g+hx}+\frac{-4ia^2ch\log\left(f\right)+iab^2h\log\left(f\right)-2ac+b^2}{bc}\right)\right)\right)+\frac{x}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*f**(h*x+g)+c*f**(2*h*x+2*g)),x)
```

```
[Out] RootSum(_z**2*(4*a**2*c*h**2*log(f)**2 - a*b**2*h**2*log(f)**2) + _z*(4*a*c
*h*log(f) - b**2*h*log(f)) + c, Lambda(_i, _i*log(f**(g + h*x) + (-4*_i*a**
2*c*h*log(f) + _i*a*b**2*h*log(f) - 2*a*c + b**2)/(b*c)))) + x/a
```

Giac [A]
time = 6.20, size = 110, normalized size = 1.17

$$-\frac{\frac{2\,b\arctan\left(\frac{2\,cf^{hx}f^{g}+b}{\sqrt{-b^2+4\,ac}}\right)}{\sqrt{-b^2+4\,ac}\,a\log\left(f\right)}+\frac{\log\left(cf^{2\,hx}f^{2\,g}+bf^{hx}f^{g}+a\right)}{a\log\left(f\right)}-\frac{2\,\log\left(|f|^{hx}|f|^{g}\right)}{a\log\left(f\right)}}{2\,h}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*f^(h*x+g)+c*f^(2*h*x+2*g)),x, algorithm="giac")
```

```
[Out] -1/2*(2*b*arctan((2*c*f^(h*x)*f^g + b)/sqrt(-b^2 + 4*a*c))/(sqrt(-b^2 + 4*a
*c)*a*log(f)) + log(c*f^(2*h*x)*f^(2*g) + b*f^(h*x)*f^g + a)/(a*log(f)) - 2
*log(abs(f)^(h*x)*abs(f)^g)/(a*log(f)))/h
```

Mupad [B]
time = 3.81, size = 96, normalized size = 1.02

$$\frac{x}{a}-\frac{\ln\left(a+c\,f^{2\,h\,x}\,f^{2\,g}+b\,f^{h\,x}\,f^g\right)}{2\,a\,h\,\ln\left(f\right)}-\frac{b\,\mathrm{atan}\left(\frac{b+2\,c\,f^{h\,x}\,f^g}{\sqrt{4\,a\,c-b^2}}\right)}{a\,h\,\ln\left(f\right)\,\sqrt{4\,a\,c-b^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a + b*f^(g + h*x) + c*f^(2*g + 2*h*x)),x)
```

```
[Out] x/a - log(a + c*f^(2*h*x)*f^(2*g) + b*f^(h*x)*f^g)/(2*a*h*log(f)) - (b*atan
((b + 2*c*f^(h*x)*f^g)/(4*a*c - b^2)^(1/2)))/(a*h*log(f)*(4*a*c - b^2)^(1/2
))
```

3.523 $\int \frac{x}{1+2f^{c+dx}+f^{2c+2dx}} \, dx$

Optimal. Leaf size=96

$$\frac{x^2}{2} - \frac{x}{d\log(f)} + \frac{x}{d\left(1+f^{c+dx}\right)\log(f)} + \frac{\log\left(1+f^{c+dx}\right)}{d^2\log^2(f)} - \frac{x\log\left(1+f^{c+dx}\right)}{d\log(f)} - \frac{\text{Li}_2\left(-f^{c+dx}\right)}{d^2\log^2(f)}$$

```
[Out] 1/2*x^2-x/d/ln(f)+x/d/(1+f^(d*x+c))/ln(f)+ln(1+f^(d*x+c))/d^2/ln(f)^2-x*ln(
1+f^(d*x+c))/d/ln(f)-polylog(2,-f^(d*x+c))/d^2/ln(f)^2
```

Rubi [A]

time = 0.16, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.440$, Rules used = {6820, 2216, 2215, 2221, 2317, 2438, 2222, 2320, 36, 29, 31}

$$-\frac{\text{PolyLog}\left(2,-f^{c+dx}\right)}{d^2\log^2(f)} + \frac{\log\left(f^{c+dx}+1\right)}{d^2\log^2(f)} - \frac{x\log\left(f^{c+dx}+1\right)}{d\log(f)} + \frac{x}{d\log(f)\left(f^{c+dx}+1\right)} - \frac{x}{d\log(f)} + \frac{x^2}{2}$$

Antiderivative was successfully verified.

```
[In] Int[x/(1 + 2*f^(c + d*x) + f^(2*c + 2*d*x)),x]
```

```
[Out] x^2/2 - x/(d*Log[f]) + x/(d*(1 + f^(c + d*x))*Log[f]) + Log[1 + f^(c + d*x)
]/(d^2*Log[f]^2) - (x*Log[1 + f^(c + d*x)])/(d*Log[f]) - PolyLog[2, -f^(c +
 d*x)]/(d^2*Log[f]^2)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 2215

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[(c + d*x)^m*((F^(g*(e + f*x)))^n/(a + b*(F^(g*(e + f*x)))^n)), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2216

```
Int[((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.))^(p_)*((c_.) +
(d_.)*(x_))^(m_.), x_Symbol] :> Dist[1/a, Int[(c + d*x)^m*(a + b*(F^(g*(e +
 f*x)))^n)^(p + 1), x], x] - Dist[b/a, Int[(c + d*x)^m*(F^(g*(e + f*x)))^n*
(a + b*(F^(g*(e + f*x)))^n)^p, x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n},
 x] && ILtQ[p, 0] && IGtQ[m, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2222

```
Int[((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((a_.) + (b_.)*((F_)^((g_.)*(
(e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :>
 Simp[(c + d*x)^m*((a + b*(F^(g*(e + f*x)))^n)^(p + 1)/(b*f*g*n*(p + 1)*Log
[F])), x] - Dist[d*(m/(b*f*g*n*(p + 1)*Log[F])), Int[(c + d*x)^(m - 1)*(a +
 b*(F^(g*(e + f*x)))^n)^(p + 1), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m
, n, p}, x] && NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6820

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rubi steps

$$\begin{aligned}
\int \frac{x}{1+2f^{c+dx}+f^{2c+2dx}}\,dx &= \int \frac{x}{(1+f^{c+dx})^2}\,dx\\
&= -\int \frac{f^{c+dx}x}{(1+f^{c+dx})^2}\,dx + \int \frac{x}{1+f^{c+dx}}\,dx\\
&= \frac{x^2}{2} + \frac{x}{d(1+f^{c+dx})\log(f)} - \frac{\int \frac{1}{1+f^{c+dx}}\,dx}{d\log(f)} - \int \frac{f^{c+dx}x}{1+f^{c+dx}}\,dx\\
&= \frac{x^2}{2} + \frac{x}{d(1+f^{c+dx})\log(f)} - \frac{x\log(1+f^{c+dx})}{d\log(f)} - \frac{\text{Subst}\left(\int \frac{1}{x(1+x)}\,dx, x, f^{c+dx}\right)}{d^2\log^2(f)}\\
&= \frac{x^2}{2} + \frac{x}{d(1+f^{c+dx})\log(f)} - \frac{x\log(1+f^{c+dx})}{d\log(f)} - \frac{\text{Subst}\left(\int \frac{1}{x}\,dx, x, f^{c+dx}\right)}{d^2\log^2(f)} + \text{Su}\\
&= \frac{x^2}{2} - \frac{x}{d\log(f)} + \frac{x}{d(1+f^{c+dx})\log(f)} + \frac{\log(1+f^{c+dx})}{d^2\log^2(f)} - \frac{x\log(1+f^{c+dx})}{d\log(f)} -
\end{aligned}$$

Mathematica [A]
time = 0.15, size = 88, normalized size = 0.92

$$\frac{1}{2}x\left(x+\frac{2}{d\log(f)+df^{c+dx}\log(f)}\right)+\frac{\log(1+f^{c+dx})}{d^2\log^2(f)}-\frac{x(1+\log(1+f^{c+dx}))}{d\log(f)}-\frac{\text{Li}_2(-f^{c+dx})}{d^2\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(1 + 2*f^(c + d*x) + f^(2*c + 2*d*x)),x]
```

```
[Out] (x*(x + 2/(d*Log[f] + d*f^(c + d*x)*Log[f])))/2 + Log[1 + f^(c + d*x)]/(d^2
*Log[f]^2) - (x*(1 + Log[1 + f^(c + d*x)]))/(d*Log[f]) - PolyLog[2, -f^(c +
 d*x)]/(d^2*Log[f]^2)
```

Maple [A]
time = 0.04, size = 143, normalized size = 1.49

method	result
risch	$\frac{x}{d(1+f^{dx+c})\ln(f)}+\frac{x^2}{2}+\frac{cx}{d}+\frac{c^2}{2d^2}-\frac{\ln(1+f^{dx}f^c)x}{d\ln(f)}-\frac{\text{polylog}(2,-f^{dx}f^c)}{d^2\ln(f)^2}+\frac{\ln(1+f^{dx}f^c)}{d^2\ln(f)^2}-\frac{\ln(f^{dx}f^c)}{d^2\ln(f)^2}-\frac{c\ln(f^{dx}f^c)}{d^2\ln(f)}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(1+2*f^(d*x+c)+f^(2*d*x+2*c)),x,method=_RETURNVERBOSE)
```

```
[Out] x/d/(1+f^(d*x+c))/ln(f)+1/2*x^2+1/d*c*x+1/2/d^2*c^2-1/d/ln(f)*ln(1+f^(d*x)*
f^c)*x-1/d^2/ln(f)^2*polylog(2,-f^(d*x)*f^c)+1/d^2/ln(f)^2*ln(1+f^(d*x)*f^c
)-1/d^2/ln(f)^2*ln(f^(d*x)*f^c)-1/d^2/ln(f)*c*ln(f^(d*x)*f^c)
```

Maxima [A]
time = 0.30, size = 95, normalized size = 0.99

$$\frac{1}{2}x^2+\frac{x}{df^{dx}f^c\log(f)+d\log(f)}-\frac{x}{d\log(f)}-\frac{dx\log\left(f^{dx}f^c+1\right)\log(f)+\mathrm{Li}_2\left(-f^{dx}f^c\right)}{d^2\log(f)^2}+\frac{\log\left(f^{dx}f^c+1\right)}{d^2\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(1+2*f^(d*x+c)+f^(2*d*x+2*c)),x, algorithm="maxima")
```

```
[Out] 1/2*x^2 + x/(d*f^(d*x)*f^c*log(f) + d*log(f)) - x/(d*log(f)) - (d*x*log(f^(
d*x)*f^c + 1)*log(f) + dilog(-f^(d*x)*f^c))/(d^2*log(f)^2) + log(f^(d*x)*f^
c + 1)/(d^2*log(f)^2)
```

Fricas [A]
time = 0.41, size = 143, normalized size = 1.49

$$\frac{(d^2x^2-c^2)\log(f)^2+\left((d^2x^2-c^2)\log(f)^2-2(dx+c)\log(f)\right)f^{dx+c}-2\left(f^{dx+c}+1\right)\mathrm{Li}_2\left(-f^{dx+c}\right)-2\left(dx\log(f)+(dx\log(f)-1)f^{dx+c}-1\right)\log\left(f^{dx+c}+1\right)-2c\log(f)}{2\left(d^2f^{dx+c}\log(f)^2+d^2\log(f)^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(1+2*f^(d*x+c)+f^(2*d*x+2*c)),x, algorithm="fricas")
```

```
[Out] 1/2*((d^2*x^2 - c^2)*log(f)^2 + ((d^2*x^2 - c^2)*log(f)^2 - 2*(d*x + c)*log
(f))*f^(d*x + c) - 2*(f^(d*x + c) + 1)*dilog(-f^(d*x + c)) - 2*(d*x*log(f)
+ (d*x*log(f) - 1)*f^(d*x + c) - 1)*log(f^(d*x + c) + 1) - 2*c*log(f))/(d^2
*f^(d*x + c)*log(f)^2 + d^2*log(f)^2)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{x}{df^{c+dx}\log(f)+d\log(f)}+\frac{\int\frac{dx\log(f)}{e^{c\log(f)}e^{dx\log(f)}+1}\,dx+\int\left(-\frac{1}{e^{c\log(f)}e^{dx\log(f)}+1}\right)dx}{d\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(1+2*f**(d*x+c)+f**(2*d*x+2*c)),x)
```

```
[Out] x/(d*f**(c + d*x)*log(f) + d*log(f)) + (Integral(d*x*log(f)/(exp(c*log(f))*
exp(d*x*log(f)) + 1), x) + Integral(-1/(exp(c*log(f))*exp(d*x*log(f)) + 1),
 x))/(d*log(f))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(1+2*f^(d*x+c)+f^(2*d*x+2*c)),x, algorithm="giac")
```

```
[Out] integrate(x/(f^(2*d*x + 2*c) + 2*f^(d*x + c) + 1), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x}{f^{2\,c+2\,d\,x}+2\,f^{c+d\,x}+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(f^(2*c + 2*d*x) + 2*f^(c + d*x) + 1),x)
```

```
[Out] int(x/(f^(2*c + 2*d*x) + 2*f^(c + d*x) + 1), x)
```

3.524 $\int \frac{x}{a+bf^{c+dx}+cf^{2c+2dx}}\,dx$

Optimal. Leaf size=338

$$-\frac{cx^2}{b^2-4ac-b\sqrt{b^2-4ac}}-\frac{cx^2}{b^2-4ac+b\sqrt{b^2-4ac}}-\frac{2cx\log\left(1+\frac{2cf^{c+dx}}{b-\sqrt{b^2-4ac}}\right)}{\sqrt{b^2-4ac}\left(b-\sqrt{b^2-4ac}\right)d\log(f)}+\frac{2cx\log\left(\right.}{\sqrt{b^2-4ac}\left(\right.}$$

```
[Out] -2*c*x*ln(1+2*c*f^(d*x+c)/(b-(-4*a*c+b^2)^(1/2)))/d/ln(f)/(b-(-4*a*c+b^2)^(
1/2))/(-4*a*c+b^2)^(1/2)-2*c*polylog(2,-2*c*f^(d*x+c)/(b-(-4*a*c+b^2)^(1/2)
))/d^2/ln(f)^2/(b-(-4*a*c+b^2)^(1/2))/(-4*a*c+b^2)^(1/2)+2*c*x*ln(1+2*c*f^(
d*x+c)/(b+(-4*a*c+b^2)^(1/2)))/d/ln(f)/(-4*a*c+b^2)^(1/2)/(b+(-4*a*c+b^2)^(
1/2))+2*c*polylog(2,-2*c*f^(d*x+c)/(b+(-4*a*c+b^2)^(1/2)))/d^2/ln(f)^2/(-4*
a*c+b^2)^(1/2)/(b+(-4*a*c+b^2)^(1/2))-c*x^2/(b^2-4*a*c-b*(-4*a*c+b^2)^(1/2)
)-c*x^2/(b^2-4*a*c+b*(-4*a*c+b^2)^(1/2))
```

Rubi [A]
time = 0.46, antiderivative size = 338, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$, Rules used = {2295, 2215, 2221, 2317, 2438}

$$-\frac{2c\text{PolyLog}\left(2,-\frac{2cf^{c+dx}}{b-\sqrt{b^2-4ac}}\right)}{d^2\log^2(f)\sqrt{b^2-4ac}\left(b-\sqrt{b^2-4ac}\right)}+\frac{2c\text{PolyLog}\left(2,-\frac{2cf^{c+dx}}{\sqrt{b^2-4ac}+b}\right)}{d^2\log^2(f)\sqrt{b^2-4ac}\left(\sqrt{b^2-4ac}+b\right)}-\frac{2cx\log\left(\frac{2cf^{c+dx}}{b-\sqrt{b^2-4ac}}+1\right)}{d\log(f)\sqrt{b^2-4ac}\left(b-\sqrt{b^2-4ac}\right)}+\frac{2cx\log\left(\frac{2cf^{c+dx}}{\sqrt{b^2-4ac}+b}+1\right)}{d\log(f)\sqrt{b^2-4ac}\left(\sqrt{b^2-4ac}+b\right)}-\frac{cx^2}{-b\sqrt{b^2-4ac}-4ac+b^2}-\frac{cx^2}{b\sqrt{b^2-4ac}-4ac+b^2}$$

Antiderivative was successfully verified.

```
[In] Int[x/(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x)),x]
```

```
[Out] -((c*x^2)/(b^2 - 4*a*c - b*Sqrt[b^2 - 4*a*c])) - (c*x^2)/(b^2 - 4*a*c + b*S
qrt[b^2 - 4*a*c]) - (2*c*x*Log[1 + (2*c*f^(c + d*x))/(b - Sqrt[b^2 - 4*a*c]
)])/(Sqrt[b^2 - 4*a*c]*(b - Sqrt[b^2 - 4*a*c])*d*Log[f]) + (2*c*x*Log[1 + (
2*c*f^(c + d*x))/(b + Sqrt[b^2 - 4*a*c])])/(Sqrt[b^2 - 4*a*c]*(b + Sqrt[b^2
 - 4*a*c])*d*Log[f]) - (2*c*PolyLog[2, (-2*c*f^(c + d*x))/(b - Sqrt[b^2 - 4
*a*c])])/(Sqrt[b^2 - 4*a*c]*(b - Sqrt[b^2 - 4*a*c])*d^2*Log[f]^2) + (2*c*Po
lyLog[2, (-2*c*f^(c + d*x))/(b + Sqrt[b^2 - 4*a*c])])/(Sqrt[b^2 - 4*a*c]*(b
 + Sqrt[b^2 - 4*a*c])*d^2*Log[f]^2)
```

Rule 2215

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[(c + d*x)^m*((F^(g*(e + f*x)))^n/(a + b*(F^(g*(e + f*x)))^n)), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2295

```
Int[((f_.) + (g_.)*(x_))^(m_.)/((a_.) + (b_.)*(F_)^(u_) + (c_.)*(F_)^(v_)),
 x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[(f + g*x)^m/
(b - q + 2*c*F^u), x], x] - Dist[2*(c/q), Int[(f + g*x)^m/(b + q + 2*c*F^u)
, x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v, 2*u] && LinearQ[u, x] &
& NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x}{a+bf^{c+dx}+cf^{2c+2dx}}\,dx = \frac{(2c)\int \frac{x}{b-\sqrt{b^2-4ac}+2cf^{c+dx}}\,dx}{\sqrt{b^2-4ac}} - \frac{(2c)\int \frac{x}{b+\sqrt{b^2-4ac}+2cf^{c+dx}}\,dx}{\sqrt{b^2-4ac}}$$

$$= -\frac{cx^2}{b^2-4ac-b\sqrt{b^2-4ac}} - \frac{cx^2}{b^2-4ac+b\sqrt{b^2-4ac}} + \frac{(4c^2)\int \frac{f^{c+dx}x}{b-\sqrt{b^2-4ac}+\cdots}}{b^2-4ac-b\sqrt{b^2-\cdots}}$$

$$= -\frac{cx^2}{b^2-4ac-b\sqrt{b^2-4ac}} - \frac{cx^2}{b^2-4ac+b\sqrt{b^2-4ac}} + \frac{2cx\log\left(1+\frac{2c\cdots}{b-\sqrt{b\cdots}}\right.}{\left(b^2-4ac-b\sqrt{b^2-4\cdots}\right.}$$

$$= -\frac{cx^2}{b^2-4ac-b\sqrt{b^2-4ac}} - \frac{cx^2}{b^2-4ac+b\sqrt{b^2-4ac}} + \frac{2cx\log\left(1+\frac{2c\cdots}{b-\sqrt{b\cdots}}\right.}{\left(b^2-4ac-b\sqrt{b^2-4\cdots}\right.}$$

$$= -\frac{cx^2}{b^2-4ac-b\sqrt{b^2-4ac}} - \frac{cx^2}{b^2-4ac+b\sqrt{b^2-4ac}} + \frac{2cx\log\left(1+\frac{2c\cdots}{b-\sqrt{b\cdots}}\right.}{\left(b^2-4ac-b\sqrt{b^2-4\cdots}\right.}$$

Mathematica [F]
time = 5.10, size = 0, normalized size = 0.00

$$\int \frac{x}{a+bf^{c+dx}+cf^{2c+2dx}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[x/(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x)),x]
```

```
[Out] Integrate[x/(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x)), x]
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 854 vs. $2(310) = 620$.
time = 0.05, size = 855, normalized size = 2.53

method	result
risch	$-\frac{\ln\left(\frac{-2c\,f^{dx} f^{c}+\sqrt{-4ca+b^{2}}-b}{-b+\sqrt{-4ca+b^{2}}}\right)x}{2d\ln(f)a}-\frac{\ln\left(\frac{-2c\,f^{dx} f^{c}+\sqrt{-4ca+b^{2}}-b}{-b+\sqrt{-4ca+b^{2}}}\right)c}{2d^{2}\ln(f)a}-\frac{\ln\left(\frac{-2c\,f^{dx} f^{c}+\sqrt{-4ca+b^{2}}-b}{-b+\sqrt{-4ca+b^{2}}}\right)bx}{2d\ln(f)a\sqrt{-4ca+b^{2}}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2/d/ln(f)/a*ln((-2*c*f^(d*x)*f^c+(-4*a*c+b^2)^(1/2)-b)/(-b+(-4*a*c+b^2)^
(1/2)))*x-1/2/d^2/ln(f)/a*ln((-2*c*f^(d*x)*f^c+(-4*a*c+b^2)^(1/2)-b)/(-b+(-
4*a*c+b^2)^(1/2)))*c-1/2/d/ln(f)/a/(-4*a*c+b^2)^(1/2)*ln((-2*c*f^(d*x)*f^c+
(-4*a*c+b^2)^(1/2)-b)/(-b+(-4*a*c+b^2)^(1/2)))*b*x-1/2/d^2/ln(f)/a/(-4*a*c+
b^2)^(1/2)*ln((-2*c*f^(d*x)*f^c+(-4*a*c+b^2)^(1/2)-b)/(-b+(-4*a*c+b^2)^(1/2
)))*b*c-1/2/d/ln(f)/a*ln((2*c*f^(d*x)*f^c+(-4*a*c+b^2)^(1/2)+b)/(b+(-4*a*c+
b^2)^(1/2)))*x-1/2/d^2/ln(f)/a*ln((2*c*f^(d*x)*f^c+(-4*a*c+b^2)^(1/2)+b)/(b
+(-4*a*c+b^2)^(1/2)))*c+1/2/d/ln(f)/a/(-4*a*c+b^2)^(1/2)*ln((2*c*f^(d*x)*f^
c+(-4*a*c+b^2)^(1/2)+b)/(b+(-4*a*c+b^2)^(1/2)))*b*x+1/2/d^2/ln(f)/a/(-4*a*c
+b^2)^(1/2)*ln((2*c*f^(d*x)*f^c+(-4*a*c+b^2)^(1/2)+b)/(b+(-4*a*c+b^2)^(1/2)
))*b*c-1/2/d^2/ln(f)^2/a*dilog((2*c*f^(d*x)*f^c+(-4*a*c+b^2)^(1/2)+b)/(b+(-
4*a*c+b^2)^(1/2)))+1/2/d^2/ln(f)^2/a/(-4*a*c+b^2)^(1/2)*dilog((2*c*f^(d*x)*
f^c+(-4*a*c+b^2)^(1/2)+b)/(b+(-4*a*c+b^2)^(1/2)))*b-1/2/d^2/ln(f)^2/a*dilog
((-2*c*f^(d*x)*f^c+(-4*a*c+b^2)^(1/2)-b)/(-b+(-4*a*c+b^2)^(1/2)))-1/2/d^2/l
n(f)^2/a/(-4*a*c+b^2)^(1/2)*dilog((-2*c*f^(d*x)*f^c+(-4*a*c+b^2)^(1/2)-b)/(
-b+(-4*a*c+b^2)^(1/2)))*b+1/2*x^2/a+1/d/a*c*x+1/2/d^2/a*c^2+1/2/d^2/ln(f)*c
/a*ln(a+b*f^(d*x)*f^c+c*(f^(d*x))^2*(f^c)^2)+1/d^2/ln(f)*c/a*b/(4*a*c-b^2)^
(1/2)*arctan((2*c*f^(d*x)*f^c+b)/(4*a*c-b^2)^(1/2))-1/d^2/ln(f)*c/a*ln(f^(d
*x)*f^c)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re deta
```

Fricas [**A**]
time = 0.38, size = 497, normalized size = 1.47

$$\frac{(b^2-4\,ac)d^2x^2\log(f)^2-\left(ab\sqrt{\frac{b^2-4\,ac}{a^2}}+b^2-4\,ac\right){\rm Li}_2\left(-\frac{\left(a\sqrt{\frac{b^2-4\,ac}{a^2}}+b\right)f^{dx+c}+2\,a}{2\,a}+1\right)+\left(ab\sqrt{\frac{b^2-4\,ac}{a^2}}-b^2+4\,ac\right){\rm Li}_2\left(\frac{\left(a\sqrt{\frac{b^2-4\,ac}{a^2}}-b\right)f^{dx+c}-2\,a}{2\,a}+1\right)-\left(abc\sqrt{\frac{b^2-4\,ac}{a^2}}\log(f)-(b^2c-4\,ac^2)\log(f)\right)\log\left(2\,cf^{dx+c}+a\sqrt{\frac{b^2-4\,ac}{a^2}}+b\right)+\left(abc\sqrt{\frac{b^2-4\,ac}{a^2}}\log(f)+(b^2c-4\,ac^2)\log(f)\right)\log\left(2\,cf^{dx+c}-a\sqrt{\frac{b^2-4\,ac}{a^2}}+b\right)-\left((abdx+abc)\sqrt{\frac{b^2-4\,ac}{a^2}}\log(f)+(b^2c-4\,ac^2+(b^2-4\,ac)dx)\log(f)\right)\log\left(\frac{\left(a\sqrt{\frac{b^2-4\,ac}{a^2}}+b\right)f^{dx+c}+2\,a}{2\,a}\right)+\left((abdx+abc)\sqrt{\frac{b^2-4\,ac}{a^2}}\log(f)-(b^2c-4\,ac^2+(b^2-4\,ac)dx)\log(f)\right)\log\left(-\frac{\left(a\sqrt{\frac{b^2-4\,ac}{a^2}}-b\right)f^{dx+c}-2\,a}{2\,a}\right)}{2\,(ab^2-4\,a^2c)d^2\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x, algorithm="fricas")
```

```
[Out] 1/2*((b^2 - 4*a*c)*d^2*x^2*log(f)^2 - (a*b*sqrt((b^2 - 4*a*c)/a^2) + b^2 -
4*a*c)*dilog(-1/2*((a*sqrt((b^2 - 4*a*c)/a^2) + b)*f^(d*x + c) + 2*a)/a + 1
) + (a*b*sqrt((b^2 - 4*a*c)/a^2) - b^2 + 4*a*c)*dilog(1/2*((a*sqrt((b^2 - 4
*a*c)/a^2) - b)*f^(d*x + c) - 2*a)/a + 1) - (a*b*c*sqrt((b^2 - 4*a*c)/a^2)*
log(f) - (b^2*c - 4*a*c^2)*log(f))*log(2*c*f^(d*x + c) + a*sqrt((b^2 - 4*a*
c)/a^2) + b) + (a*b*c*sqrt((b^2 - 4*a*c)/a^2)*log(f) + (b^2*c - 4*a*c^2)*lo
g(f))*log(2*c*f^(d*x + c) - a*sqrt((b^2 - 4*a*c)/a^2) + b) - ((a*b*d*x + a*
b*c)*sqrt((b^2 - 4*a*c)/a^2)*log(f) + (b^2*c - 4*a*c^2 + (b^2 - 4*a*c)*d*x)
*log(f))*log(1/2*((a*sqrt((b^2 - 4*a*c)/a^2) + b)*f^(d*x + c) + 2*a)/a) + (
(a*b*d*x + a*b*c)*sqrt((b^2 - 4*a*c)/a^2)*log(f) - (b^2*c - 4*a*c^2 + (b^2
- 4*a*c)*d*x)*log(f))*log(-1/2*((a*sqrt((b^2 - 4*a*c)/a^2) - b)*f^(d*x + c)
 - 2*a)/a))/((a*b^2 - 4*a^2*c)*d^2*log(f)^2)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{a+bf^cf^{dx}+cf^{2c}f^{2dx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*f**(d*x+c)+c*f**(2*d*x+2*c)),x)
```

```
[Out] Integral(x/(a + b*f**c*f**(d*x) + c*f**(2*c)*f**(2*d*x)), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x, algorithm="giac")
```

```
[Out] integrate(x/(c*f^(2*d*x + 2*c) + b*f^(d*x + c) + a), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x}{a+b\,f^{c+d\,x}+c\,f^{2\,c+2\,d\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x)),x)
```

```
[Out] int(x/(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x)), x)
```

3.525 $\int \frac{x^2}{1+2f^{c+dx}+f^{2c+2dx}} \, dx$

Optimal. Leaf size=145

$$\frac{x^3}{3}-\frac{x^2}{d\log(f)}+\frac{x^2}{d\left(1+f^{c+dx}\right)\log(f)}+\frac{2x\log\left(1+f^{c+dx}\right)}{d^2\log^2(f)}-\frac{x^2\log\left(1+f^{c+dx}\right)}{d\log(f)}+\frac{2\text{Li}_2\left(-f^{c+dx}\right)}{d^3\log^3(f)}-\frac{2x\text{Li}_2\left(-f^{c+dx}\right)}{d^2\log^2(f)}$$

```
[Out] 1/3*x^3-x^2/d/ln(f)+x^2/d/(1+f^(d*x+c))/ln(f)+2*x*ln(1+f^(d*x+c))/d^2/ln(f)
^2-x^2*ln(1+f^(d*x+c))/d/ln(f)+2*polylog(2,-f^(d*x+c))/d^3/ln(f)^3-2*x*poly
log(2,-f^(d*x+c))/d^2/ln(f)^2+2*polylog(3,-f^(d*x+c))/d^3/ln(f)^3
```

Rubi [A]
time = 0.29, antiderivative size = 145, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 10, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.370$, Rules used = {6820, 2216, 2215, 2221, 2611, 2320, 6724, 2222, 2317, 2438}

$$\frac{2\text{PolyLog}\left(2,-f^{c+dx}\right)}{d^3\log^3(f)}+\frac{2\text{PolyLog}\left(3,-f^{c+dx}\right)}{d^3\log^3(f)}-\frac{2x\text{PolyLog}\left(2,-f^{c+dx}\right)}{d^2\log^2(f)}+\frac{2x\log\left(f^{c+dx}+1\right)}{d^2\log^2(f)}-\frac{x^2\log\left(f^{c+dx}+1\right)}{d\log(f)}+\frac{x^2}{d\log(f)\left(f^{c+dx}+1\right)}-\frac{x^2}{d\log(f)}+\frac{x^3}{3}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(1 + 2*f^(c + d*x) + f^(2*c + 2*d*x)),x]
```

```
[Out] x^3/3 - x^2/(d*Log[f]) + x^2/(d*(1 + f^(c + d*x))*Log[f]) + (2*x*Log[1 + f^
(c + d*x)])/(d^2*Log[f]^2) - (x^2*Log[1 + f^(c + d*x)])/(d*Log[f]) + (2*Pol
yLog[2, -f^(c + d*x)])/(d^3*Log[f]^3) - (2*x*PolyLog[2, -f^(c + d*x)])/(d^2
*Log[f]^2) + (2*PolyLog[3, -f^(c + d*x)])/(d^3*Log[f]^3)
```

Rule 2215

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[(c + d*x)^m*((F^(g*(e + f*x)))^n/(a + b*(F^(g*(e + f*x)))^n)), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2216

```
Int[((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.))^(p_)*((c_.) +
(d_.)*(x_))^(m_.), x_Symbol] :> Dist[1/a, Int[(c + d*x)^m*(a + b*(F^(g*(e +
 f*x)))^n)^(p + 1), x], x] - Dist[b/a, Int[(c + d*x)^m*(F^(g*(e + f*x)))^n*
(a + b*(F^(g*(e + f*x)))^n)^p, x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n},
 x] && ILtQ[p, 0] && IGtQ[m, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
```

```
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2222

```
Int[((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((a_.) + (b_.)*((F_)^((g_.)*(
(e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :>
 Simp[(c + d*x)^m*((a + b*(F^(g*(e + f*x)))^n)^(p + 1)/(b*f*g*n*(p + 1)*Log
[F])), x] - Dist[d*(m/(b*f*g*n*(p + 1)*Log[F])), Int[(c + d*x)^(m - 1)*(a +
 b*(F^(g*(e + f*x)))^n)^(p + 1), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m
, n, p}, x] && NeQ[p, -1]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6820

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2}{1+2f^{c+dx}+f^{2c+2dx}}\,dx &= \int \frac{x^2}{(1+f^{c+dx})^2}\,dx\\
&= -\int \frac{f^{c+dx}x^2}{(1+f^{c+dx})^2}\,dx + \int \frac{x^2}{1+f^{c+dx}}\,dx\\
&= \frac{x^3}{3} + \frac{x^2}{d(1+f^{c+dx})\log(f)} - \frac{2\int \frac{x}{1+f^{c+dx}}\,dx}{d\log(f)} - \int \frac{f^{c+dx}x^2}{1+f^{c+dx}}\,dx\\
&= \frac{x^3}{3} - \frac{x^2}{d\log(f)} + \frac{x^2}{d(1+f^{c+dx})\log(f)} - \frac{x^2\log(1+f^{c+dx})}{d\log(f)} + \frac{2\int \frac{f^{c+dx}x}{1+f^{c+dx}}\,dx}{d\log(f)} +\\
&= \frac{x^3}{3} - \frac{x^2}{d\log(f)} + \frac{x^2}{d(1+f^{c+dx})\log(f)} + \frac{2x\log(1+f^{c+dx})}{d^2\log^2(f)} - \frac{x^2\log(1+f^{c+dx}}{d\log(f)}\\
&= \frac{x^3}{3} - \frac{x^2}{d\log(f)} + \frac{x^2}{d(1+f^{c+dx})\log(f)} + \frac{2x\log(1+f^{c+dx})}{d^2\log^2(f)} - \frac{x^2\log(1+f^{c+dx}}{d\log(f)}\\
&= \frac{x^3}{3} - \frac{x^2}{d\log(f)} + \frac{x^2}{d(1+f^{c+dx})\log(f)} + \frac{2x\log(1+f^{c+dx})}{d^2\log^2(f)} - \frac{x^2\log(1+f^{c+dx}}{d\log(f)}
\end{aligned}$$

Mathematica [A]
time = 0.20, size = 123, normalized size = 0.85

$$\frac{d^3x^3\log^3(f) + 6dx\log(f)\log(1+f^{c+dx}) - \frac{3d^2x^2\log^2(f)(f^{c+dx}+(1+f^{c+dx})\log(1+f^{c+dx}))}{1+f^{c+dx}} + (6-6dx\log(f))\text{Li}_2(-f^{c+dx}) + 6\text{Li}_3(-f^{c+dx})}{3d^3\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(1 + 2*f^(c + d*x) + f^(2*c + 2*d*x)),x]
```

```
[Out] (d^3*x^3*Log[f]^3 + 6*d*x*Log[f]*Log[1 + f^(c + d*x)] - (3*d^2*x^2*Log[f]^2
*(f^(c + d*x) + (1 + f^(c + d*x))*Log[1 + f^(c + d*x)]))/(1 + f^(c + d*x))
+ (6 - 6*d*x*Log[f])*PolyLog[2, -f^(c + d*x)] + 6*PolyLog[3, -f^(c + d*x)])
/(3*d^3*Log[f]^3)
```

Maple [A]
time = 0.04, size = 232, normalized size = 1.60

method	result

risch	$\frac{x^2}{d(1+f^{dx+c})\ln(f)}+\frac{x^3}{3}-\frac{c^2x}{d^2}-\frac{2c^3}{3d^3}-\frac{\ln(1+f^{dx}f^c)x^2}{d\ln(f)}-\frac{2\,\mathrm{polylog}(2,-f^{dx}f^c)x}{d^2\ln(f)^2}+\frac{2\,\mathrm{polylog}(3,-f^{dx}f^c)}{d^3\ln(f)^3}+\frac{c^2\ln(f^{dx}f^c}{d^3\ln(f)}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(1+2*f^(d*x+c)+f^(2*d*x+2*c)),x,method=_RETURNVERBOSE)
```

```
[Out] x^2/d/(1+f^(d*x+c))/ln(f)+1/3*x^3-1/d^2*c^2*x-2/3/d^3*c^3-1/d/ln(f)*ln(1+f^
(d*x)*f^c)*x^2-2/d^2/ln(f)^2*polylog(2,-f^(d*x)*f^c)*x+2/d^3/ln(f)^3*polylo
g(3,-f^(d*x)*f^c)+1/d^3/ln(f)*c^2*ln(f^(d*x)*f^c)-x^2/d/ln(f)-2/d^2/ln(f)*c
*x-1/d^3/ln(f)*c^2+2/d^2/ln(f)^2*ln(1+f^(d*x)*f^c)*x+2/d^3/ln(f)^3*polylog(
2,-f^(d*x)*f^c)+2/d^3/ln(f)^2*c*ln(f^(d*x)*f^c)
```

Maxima [A]
time = 0.30, size = 159, normalized size = 1.10

$$\frac{x^2}{df^{dx}f^c\log(f)+d\log(f)}+\frac{d^3x^3\log(f)^3-3\,d^2x^2\log(f)^2}{3\,d^3\log(f)^3}-\frac{d^2x^2\log(f^{dx}f^c+1)\log(f)^2+2\,dx\mathrm{Li}_2(-f^{dx}f^c)\log(f)-2\,\mathrm{Li}_3(-f^{dx}f^c)}{d^3\log(f)^3}+\frac{2\,(dx\log(f^{dx}f^c+1)\log(f)+\mathrm{Li}_2(-f^{dx}f^c))}{d^3\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(1+2*f^(d*x+c)+f^(2*d*x+2*c)),x, algorithm="maxima")
```

```
[Out] x^2/(d*f^(d*x)*f^c*log(f) + d*log(f)) + 1/3*(d^3*x^3*log(f)^3 - 3*d^2*x^2*l
og(f)^2)/(d^3*log(f)^3) - (d^2*x^2*log(f^(d*x)*f^c + 1)*log(f)^2 + 2*d*x*di
log(-f^(d*x)*f^c)*log(f) - 2*polylog(3, -f^(d*x)*f^c))/(d^3*log(f)^3) + 2*(
d*x*log(f^(d*x)*f^c + 1)*log(f) + dilog(-f^(d*x)*f^c))/(d^3*log(f)^3)
```

Fricas [A]
time = 0.41, size = 210, normalized size = 1.45

$$\frac{3\,c^2\log(f)^2+(d^3x^3+c^3)\log(f)^3+((d^3x^3+c^3)\log(f)^3-3\,(d^2x^2-c^2)\log(f)^2)f^{dx+c}-6\,(dx\log(f)+(dx\log(f)-1)f^{dx+c}-1)\mathrm{Li}_2(-f^{dx+c})-3\,(d^2x^2\log(f)^2-2\,dx\log(f)+(d^2x^2\log(f)^2-2\,dx\log(f))f^{dx+c})\log(f^{dx+c}+1)+6\,(f^{dx+c}+1)\mathrm{polylog}(3,-f^{dx+c})}{3\,(d^3f^{dx+c}\log(f)^3+d^3\log(f)^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(1+2*f^(d*x+c)+f^(2*d*x+2*c)),x, algorithm="fricas")
```

```
[Out] 1/3*(3*c^2*log(f)^2 + (d^3*x^3 + c^3)*log(f)^3 + ((d^3*x^3 + c^3)*log(f)^3
- 3*(d^2*x^2 - c^2)*log(f)^2)*f^(d*x + c) - 6*(d*x*log(f) + (d*x*log(f) - 1
)*f^(d*x + c) - 1)*dilog(-f^(d*x + c)) - 3*(d^2*x^2*log(f)^2 - 2*d*x*log(f)
 + (d^2*x^2*log(f)^2 - 2*d*x*log(f))*f^(d*x + c))*log(f^(d*x + c) + 1) + 6*
(f^(d*x + c) + 1)*polylog(3, -f^(d*x + c)))/(d^3*f^(d*x + c)*log(f)^3 + d^3
*log(f)^3)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{x^2}{df^{c+dx}\log(f)+d\log(f)}+\frac{\int\left(-\frac{2x}{e^{c\log(f)}e^{dx\log(f)}+1}\right)dx+\int\frac{dx^2\log(f)}{e^{c\log(f)}e^{dx\log(f)}+1}\,dx}{d\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(1+2*f**(d*x+c)+f**(2*d*x+2*c)),x)
```

```
[Out] x**2/(d*f**(c + d*x)*log(f) + d*log(f)) + (Integral(-2*x/(exp(c*log(f))*exp
(d*x*log(f)) + 1), x) + Integral(d*x**2*log(f)/(exp(c*log(f))*exp(d*x*log(f
)) + 1), x))/(d*log(f))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(1+2*f^(d*x+c)+f^(2*d*x+2*c)),x, algorithm="giac")
```

```
[Out] integrate(x^2/(f^(2*d*x + 2*c) + 2*f^(d*x + c) + 1), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{f^{2\,c+2\,d\,x}+2\,f^{c+d\,x}+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(f^(2*c + 2*d*x) + 2*f^(c + d*x) + 1),x)
```

```
[Out] int(x^2/(f^(2*c + 2*d*x) + 2*f^(c + d*x) + 1), x)
```

3.526 $\int \frac{x^2}{a+bf^{c+dx}+cf^{2c+2dx}}\,dx$

Optimal. Leaf size=484

$$-\frac{2cx^3}{3\left(b^2-4ac-b\sqrt{b^2-4ac}\right)}-\frac{2cx^3}{3\left(b^2-4ac+b\sqrt{b^2-4ac}\right)}-\frac{2cx^2\log\left(1+\frac{2cf^{c+dx}}{b-\sqrt{b^2-4ac}}\right)}{\sqrt{b^2-4ac}\left(b-\sqrt{b^2-4ac}\right)d\log(f)}+\frac{}{\sqrt{b^2}}$$

```
[Out] -2*c*x^2*ln(1+2*c*f^(d*x+c)/(b-(-4*a*c+b^2)^(1/2)))/d/ln(f)/(b-(-4*a*c+b^2)
^(1/2))/(-4*a*c+b^2)^(1/2)-4*c*x*polylog(2,-2*c*f^(d*x+c)/(b-(-4*a*c+b^2)^(
1/2)))/d^2/ln(f)^2/(b-(-4*a*c+b^2)^(1/2))/(-4*a*c+b^2)^(1/2)+4*c*polylog(3,
-2*c*f^(d*x+c)/(b-(-4*a*c+b^2)^(1/2)))/d^3/ln(f)^3/(b-(-4*a*c+b^2)^(1/2))/(
-4*a*c+b^2)^(1/2)+2*c*x^2*ln(1+2*c*f^(d*x+c)/(b+(-4*a*c+b^2)^(1/2)))/d/ln(f
)/(-4*a*c+b^2)^(1/2)/(b+(-4*a*c+b^2)^(1/2))+4*c*x*polylog(2,-2*c*f^(d*x+c)/
(b+(-4*a*c+b^2)^(1/2)))/d^2/ln(f)^2/(-4*a*c+b^2)^(1/2)/(b+(-4*a*c+b^2)^(1/2
))-4*c*polylog(3,-2*c*f^(d*x+c)/(b+(-4*a*c+b^2)^(1/2)))/d^3/ln(f)^3/(-4*a*c
+b^2)^(1/2)/(b+(-4*a*c+b^2)^(1/2))-2/3*c*x^3/(b^2-4*a*c-b*(-4*a*c+b^2)^(1/2
))-2/3*c*x^3/(b^2-4*a*c+b*(-4*a*c+b^2)^(1/2))
```

Rubi [A]

time = 0.59, antiderivative size = 484, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 6, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.207$, Rules used = {2295, 2215, 2221, 2611, 2320, 6724}

$$\frac{4c\,\text{PolyLog}\left(3,-\frac{2cf^{c+dx}}{b-\sqrt{b^2-4ac}}\right)}{d^3\log^3(f)\sqrt{b^2-4ac}\left(b-\sqrt{b^2-4ac}\right)}-\frac{4c\,\text{PolyLog}\left(3,-\frac{2cf^{c+dx}}{\sqrt{b^2-4ac}+b}\right)}{d^3\log^3(f)\sqrt{b^2-4ac}\left(\sqrt{b^2-4ac}+b\right)}-\frac{4cx\,\text{PolyLog}\left(2,-\frac{2cf^{c+dx}}{b-\sqrt{b^2-4ac}}\right)}{d^2\log^2(f)\sqrt{b^2-4ac}\left(b-\sqrt{b^2-4ac}\right)}+\frac{4cx\,\text{PolyLog}\left(2,-\frac{2cf^{c+dx}}{\sqrt{b^2-4ac}+b}\right)}{d^2\log^2(f)\sqrt{b^2-4ac}\left(\sqrt{b^2-4ac}+b\right)}-\frac{2cx^2\log\left(\frac{2cf^{c+dx}}{b-\sqrt{b^2-4ac}}+1\right)}{d\log(f)\sqrt{b^2-4ac}\left(b-\sqrt{b^2-4ac}\right)}+\frac{2cx^2\log\left(\frac{2cf^{c+dx}}{\sqrt{b^2-4ac}+b}+1\right)}{d\log(f)\sqrt{b^2-4ac}\left(\sqrt{b^2-4ac}+b\right)}-\frac{2cx^3}{3\left(-b\sqrt{b^2-4ac}-4ac+b^2\right)}-\frac{2cx^3}{3\left(b\sqrt{b^2-4ac}-4ac+b^2\right)}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x)),x]
```

```
[Out] (-2*c*x^3)/(3*(b^2 - 4*a*c - b*Sqrt[b^2 - 4*a*c])) - (2*c*x^3)/(3*(b^2 - 4*
a*c + b*Sqrt[b^2 - 4*a*c])) - (2*c*x^2*Log[1 + (2*c*f^(c + d*x))/(b - Sqrt[
b^2 - 4*a*c])])/(Sqrt[b^2 - 4*a*c]*(b - Sqrt[b^2 - 4*a*c])*d*Log[f]) + (2*c
*x^2*Log[1 + (2*c*f^(c + d*x))/(b + Sqrt[b^2 - 4*a*c])])/(Sqrt[b^2 - 4*a*c]
*(b + Sqrt[b^2 - 4*a*c])*d*Log[f]) - (4*c*x*PolyLog[2, (-2*c*f^(c + d*x))/(
b - Sqrt[b^2 - 4*a*c])])/(Sqrt[b^2 - 4*a*c]*(b - Sqrt[b^2 - 4*a*c])*d^2*Log
[f]^2) + (4*c*x*PolyLog[2, (-2*c*f^(c + d*x))/(b + Sqrt[b^2 - 4*a*c])])/(Sq
rt[b^2 - 4*a*c]*(b + Sqrt[b^2 - 4*a*c])*d^2*Log[f]^2) + (4*c*PolyLog[3, (-2
*c*f^(c + d*x))/(b - Sqrt[b^2 - 4*a*c])])/(Sqrt[b^2 - 4*a*c]*(b - Sqrt[b^2
- 4*a*c])*d^3*Log[f]^3) - (4*c*PolyLog[3, (-2*c*f^(c + d*x))/(b + Sqrt[b^2
- 4*a*c])])/(Sqrt[b^2 - 4*a*c]*(b + Sqrt[b^2 - 4*a*c])*d^3*Log[f]^3)
```

Rule 2215

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
```

```
b/a, Int[(c + d*x)^m*((F^(g*(e + f*x)))^n/(a + b*(F^(g*(e + f*x)))^n)), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2295

```
Int[((f_.) + (g_.)*(x_))^(m_.)/((a_.) + (b_.)*(F_)^(u_) + (c_.)*(F_)^(v_)),
 x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[(f + g*x)^m/
(b - q + 2*c*F^u), x], x] - Dist[2*(c/q), Int[(f + g*x)^m/(b + q + 2*c*F^u)
, x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v, 2*u] && LinearQ[u, x] &
& NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^2}{a+bf^{c+dx}+cf^{2c+2dx}}\,dx = \frac{(2c)\int \frac{x^2}{b-\sqrt{b^2-4ac}+2cf^{c+dx}}\,dx}{\sqrt{b^2-4ac}} - \frac{(2c)\int \frac{x^2}{b+\sqrt{b^2-4ac}+2cf^{c+dx}}\,dx}{\sqrt{b^2-4ac}}$$

$$= -\frac{2cx^3}{3\left(b^2-4ac-b\sqrt{b^2-4ac}\right)} - \frac{2cx^3}{3\left(b^2-4ac+b\sqrt{b^2-4ac}\right)} + \frac{(4c^2)\int \frac{\cdots}{b-\sqrt{\cdots}}}{b^2-4a\cdots}$$

$$= -\frac{2cx^3}{3\left(b^2-4ac-b\sqrt{b^2-4ac}\right)} - \frac{2cx^3}{3\left(b^2-4ac+b\sqrt{b^2-4ac}\right)} + \frac{2cx^2\log\cdots}{\left(b^2-4ac-\cdots\right.}$$

$$= -\frac{2cx^3}{3\left(b^2-4ac-b\sqrt{b^2-4ac}\right)} - \frac{2cx^3}{3\left(b^2-4ac+b\sqrt{b^2-4ac}\right)} + \frac{2cx^2\log\cdots}{\left(b^2-4ac-\cdots\right.}$$

$$= -\frac{2cx^3}{3\left(b^2-4ac-b\sqrt{b^2-4ac}\right)} - \frac{2cx^3}{3\left(b^2-4ac+b\sqrt{b^2-4ac}\right)} + \frac{2cx^2\log\cdots}{\left(b^2-4ac-\cdots\right.}$$

$$= -\frac{2cx^3}{3\left(b^2-4ac-b\sqrt{b^2-4ac}\right)} - \frac{2cx^3}{3\left(b^2-4ac+b\sqrt{b^2-4ac}\right)} + \frac{2cx^2\log\cdots}{\left(b^2-4ac-\cdots\right.}$$

Mathematica [F]
time = 3.82, size = 0, normalized size = 0.00

$$\int \frac{x^2}{a+bf^{c+dx}+cf^{2c+2dx}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[x^2/(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x)),x]
[Out] Integrate[x^2/(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x)), x]
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{x^2}{a+b\,f^{dx+c}+c\,f^{2dx+2c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x)
```

```
[Out] int(x^2/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x)
```

Maxima [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re deta
```

Fricas [**A**]
time = 0.38, size = 694, normalized size = 1.43

[illegible]

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x, algorithm="fricas")
```

```
[Out] 1/6*(2*(b^2 - 4*a*c)*d^3*x^3*log(f)^3 - 6*(a*b*d*x*sqrt((b^2 - 4*a*c)/a^2)*
log(f) + (b^2 - 4*a*c)*d*x*log(f))*dilog(-1/2*((a*sqrt((b^2 - 4*a*c)/a^2) +
 b)*f^(d*x + c) + 2*a)/a + 1) + 6*(a*b*d*x*sqrt((b^2 - 4*a*c)/a^2)*log(f) -
 (b^2 - 4*a*c)*d*x*log(f))*dilog(1/2*((a*sqrt((b^2 - 4*a*c)/a^2) - b)*f^(d*
x + c) - 2*a)/a + 1) + 3*(a*b*c^2*sqrt((b^2 - 4*a*c)/a^2)*log(f)^2 - (b^2*c
^2 - 4*a*c^3)*log(f)^2)*log(2*c*f^(d*x + c) + a*sqrt((b^2 - 4*a*c)/a^2) + b
) - 3*(a*b*c^2*sqrt((b^2 - 4*a*c)/a^2)*log(f)^2 + (b^2*c^2 - 4*a*c^3)*log(f
)^2)*log(2*c*f^(d*x + c) - a*sqrt((b^2 - 4*a*c)/a^2) + b) - 3*((a*b*d^2*x^2
 - a*b*c^2)*sqrt((b^2 - 4*a*c)/a^2)*log(f)^2 + ((b^2 - 4*a*c)*d^2*x^2 - b^2
*c^2 + 4*a*c^3)*log(f)^2)*log(1/2*((a*sqrt((b^2 - 4*a*c)/a^2) + b)*f^(d*x +
 c) + 2*a)/a) + 3*((a*b*d^2*x^2 - a*b*c^2)*sqrt((b^2 - 4*a*c)/a^2)*log(f)^2
 - ((b^2 - 4*a*c)*d^2*x^2 - b^2*c^2 + 4*a*c^3)*log(f)^2)*log(-1/2*((a*sqrt(
(b^2 - 4*a*c)/a^2) - b)*f^(d*x + c) - 2*a)/a) + 6*(a*b*sqrt((b^2 - 4*a*c)/a
^2) + b^2 - 4*a*c)*polylog(3, -1/2*(a*sqrt((b^2 - 4*a*c)/a^2) + b)*f^(d*x +
 c)/a) - 6*(a*b*sqrt((b^2 - 4*a*c)/a^2) - b^2 + 4*a*c)*polylog(3, 1/2*(a*sq
rt((b^2 - 4*a*c)/a^2) - b)*f^(d*x + c)/a))/((a*b^2 - 4*a^2*c)*d^3*log(f)^3)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{a + bf^c f^{dx} + cf^{2c} f^{2dx}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a+b*f**(d*x+c)+c*f**(2*d*x+2*c)),x)
```

```
[Out] Integral(x**2/(a + b*f**c*f**(d*x) + c*f**(2*c)*f**(2*d*x)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x, algorithm="giac")
```

```
[Out] integrate(x^2/(c*f^(2*d*x + 2*c) + b*f^(d*x + c) + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2}{a+b\,f^{c+d\,x}+c\,f^{2\,c+2\,d\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x)),x)
```

```
[Out] int(x^2/(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x)), x)
```

3.527 $\int \frac{d+ef^{g+hx}}{a+bf^{g+hx}+cf^{2g+2hx}}\,dx$

Optimal. Leaf size=103

$$\frac{dx}{a}+\frac{(bd-2ae)\tanh^{-1}\left(\frac{b+2cf^{g+hx}}{\sqrt{b^2-4ac}}\right)}{a\sqrt{b^2-4ac}\,h\log(f)}-\frac{d\log\left(a+bf^{g+hx}+cf^{2g+2hx}\right)}{2ah\log(f)}$$

```
[Out] d*x/a-1/2*d*ln(a+b*f^(h*x+g)+c*f^(2*h*x+2*g))/a/h/ln(f)+(-2*a*e+b*d)*arctan
h((b+2*c*f^(h*x+g))/(-4*a*c+b^2)^(1/2))/a/h/ln(f)/(-4*a*c+b^2)^(1/2)
```

Rubi [A]
time = 0.11, antiderivative size = 103, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.162, Rules used = {2320, 814, 648, 632, 212, 642}

$$\frac{(bd-2ae)\tanh^{-1}\left(\frac{b+2cf^{g+hx}}{\sqrt{b^2-4ac}}\right)}{ah\log(f)\sqrt{b^2-4ac}}-\frac{d\log\left(a+bf^{g+hx}+cf^{2g+2hx}\right)}{2ah\log(f)}+\frac{dx}{a}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*f^(g + h*x))/(a + b*f^(g + h*x) + c*f^(2*g + 2*h*x)),x]
```

```
[Out] (d*x)/a + ((b*d - 2*a*e)*ArcTanh[(b + 2*c*f^(g + h*x))/Sqrt[b^2 - 4*a*c]])/
(a*Sqrt[b^2 - 4*a*c]*h*Log[f]) - (d*Log[a + b*f^(g + h*x) + c*f^(2*g + 2*h*
x)])/(2*a*h*Log[f])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 632

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 642

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[d*(Log[RemoveContent[a + b*x + c*x^2, x]]/b), x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 648

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 814

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_.) + (b_.)*(x_) +
(c_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*((f + g*x)/(a +
 b*x + c*x^2)), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[b^2 - 4*a*
c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegerQ[m]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$
\begin{aligned}
\int \frac{d+ef^{g+hx}}{a+bf^{g+hx}+cf^{2g+2hx}}\,dx &= \frac{\text{Subst}\left(\int \frac{d+ex}{x(a+bx+cx^2)}\,dx,x,f^{g+hx}\right)}{h\log(f)}\\
&= \frac{\text{Subst}\left(\int \left(\frac{d}{ax}+\frac{-bd+ae-cdx}{a(a+bx+cx^2)}\right)\,dx,x,f^{g+hx}\right)}{h\log(f)}\\
&= \frac{dx}{a}+\frac{\text{Subst}\left(\int \frac{-bd+ae-cdx}{a+bx+cx^2}\,dx,x,f^{g+hx}\right)}{ah\log(f)}\\
&= \frac{dx}{a}-\frac{d\text{Subst}\left(\int \frac{b+2cx}{a+bx+cx^2}\,dx,x,f^{g+hx}\right)}{2ah\log(f)}-\frac{(bd-2ae)\text{Subst}\left(\int \frac{1}{a+bx+cx^2}\,dx,x,\right.}{2ah\log(f)}\\
&= \frac{dx}{a}-\frac{d\log\left(a+bf^{g+hx}+cf^{2g+2hx}\right)}{2ah\log(f)}+\frac{(bd-2ae)\text{Subst}\left(\int \frac{1}{b^2-4ac-x^2}\,dx,x,b+\right.}{ah\log(f)}\\
&= \frac{dx}{a}+\frac{(bd-2ae)\tanh^{-1}\left(\frac{b+2cf^{g+hx}}{\sqrt{b^2-4ac}}\right)}{a\sqrt{b^2-4ac}\,h\log(f)}-\frac{d\log\left(a+bf^{g+hx}+cf^{2g+2hx}\right)}{2ah\log(f)}
\end{aligned}
$$

Mathematica [A]

time = 0.20, size = 118, normalized size = 1.15

$$\frac{(-2bd+4ae)\tan^{-1}\left(\frac{b+2cf^{g+hx}}{\sqrt{-b^2+4ac}}\right)+\sqrt{-b^2+4ac}\,d\left(2\log\left(f^{g+hx}\right)-\log\left(a+f^{g+hx}\left(b+cf^{g+hx}\right)\right)\right)}{2a\sqrt{-b^2+4ac}\,h\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*f^(g + h*x))/(a + b*f^(g + h*x) + c*f^(2*g + 2*h*x)),x]
```

```
[Out] ((-2*b*d + 4*a*e)*ArcTan[(b + 2*c*f^(g + h*x))/Sqrt[-b^2 + 4*a*c]] + Sqrt[-
b^2 + 4*a*c]*d*(2*Log[f^(g + h*x)] - Log[a + f^(g + h*x)*(b + c*f^(g + h*x)
)]))/(2*a*Sqrt[-b^2 + 4*a*c]*h*Log[f])
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 992 vs. $2(97) = 194$.

time = 0.11, size = 993, normalized size = 9.64

method	result
risch	$\frac{4\ln(f)^2 acd h^2 x}{4\ln(f)^2 a^2 c h^2-\ln(f)^2 a b^2 h^2}-\frac{\ln(f)^2 b^2 d h^2 x}{4\ln(f)^2 a^2 c h^2-\ln(f)^2 a b^2 h^2}+\frac{4\ln(f)^2 acdgh}{4\ln(f)^2 a^2 c h^2-\ln(f)^2 a b^2 h^2}-\frac{\ln(f)^2 b^2 dgh}{4\ln(f)^2 a^2 c h^2-\ln(f)^2 a b^2 h^2}-$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*f^(h*x+g))/(a+b*f^(h*x+g)+c*f^(2*h*x+2*g)),x,method=_RETURNVERBOSE
)
```

```
[Out] 4/(4*ln(f)^2*a^2*c*h^2-ln(f)^2*a*b^2*h^2)*ln(f)^2*a*c*d*h^2*x-1/(4*ln(f)^2*
a^2*c*h^2-ln(f)^2*a*b^2*h^2)*ln(f)^2*b^2*d*h^2*x+4/(4*ln(f)^2*a^2*c*h^2-ln(
f)^2*a*b^2*h^2)*ln(f)^2*a*c*d*g*h-1/(4*ln(f)^2*a^2*c*h^2-ln(f)^2*a*b^2*h^2)
*ln(f)^2*b^2*d*g*h-2/(4*a*c-b^2)/h/ln(f)*ln(f^(h*x+g)+1/2*(2*b*a*e-b^2*d+(-
16*a^3*c*e^2+4*a^2*b^2*e^2+16*a^2*b*c*d*e-4*a*b^3*d*e-4*a*b^2*c*d^2+b^4*d^2
)^(1/2))/c/(2*a*e-b*d))*c*d+1/2/a/(4*a*c-b^2)/h/ln(f)*ln(f^(h*x+g)+1/2*(2*b
*a*e-b^2*d+(-16*a^3*c*e^2+4*a^2*b^2*e^2+16*a^2*b*c*d*e-4*a*b^3*d*e-4*a*b^2*
c*d^2+b^4*d^2)^(1/2))/c/(2*a*e-b*d))*b^2*d+1/2/a/(4*a*c-b^2)/h/ln(f)*ln(f^(
h*x+g)+1/2*(2*b*a*e-b^2*d+(-16*a^3*c*e^2+4*a^2*b^2*e^2+16*a^2*b*c*d*e-4*a*b
^3*d*e-4*a*b^2*c*d^2+b^4*d^2)^(1/2))/c/(2*a*e-b*d))*(-16*a^3*c*e^2+4*a^2*b^
2*e^2+16*a^2*b*c*d*e-4*a*b^3*d*e-4*a*b^2*c*d^2+b^4*d^2)^(1/2)-2/(4*a*c-b^2)
/h/ln(f)*ln(f^(h*x+g)-1/2*(-2*b*a*e+b^2*d+(-16*a^3*c*e^2+4*a^2*b^2*e^2+16*a
^2*b*c*d*e-4*a*b^3*d*e-4*a*b^2*c*d^2+b^4*d^2)^(1/2))/c/(2*a*e-b*d))*c*d+1/2
/a/(4*a*c-b^2)/h/ln(f)*ln(f^(h*x+g)-1/2*(-2*b*a*e+b^2*d+(-16*a^3*c*e^2+4*a^
2*b^2*e^2+16*a^2*b*c*d*e-4*a*b^3*d*e-4*a*b^2*c*d^2+b^4*d^2)^(1/2))/c/(2*a*e
-b*d))*b^2*d-1/2/a/(4*a*c-b^2)/h/ln(f)*ln(f^(h*x+g)-1/2*(-2*b*a*e+b^2*d+(-1
6*a^3*c*e^2+4*a^2*b^2*e^2+16*a^2*b*c*d*e-4*a*b^3*d*e-4*a*b^2*c*d^2+b^4*d^2)
^(1/2))/c/(2*a*e-b*d))*(-16*a^3*c*e^2+4*a^2*b^2*e^2+16*a^2*b*c*d*e-4*a*b^3*
d*e-4*a*b^2*c*d^2+b^4*d^2)^(1/2)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*f^(h*x+g))/(a+b*f^(h*x+g)+c*f^(2*h*x+2*g)),x, algorithm="max
ima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re deta
```

Fricas [A]
time = 0.38, size = 332, normalized size = 3.22

$$\left[\frac{2\,(b^2-4\,ac)dhx\log(f)-(b^2-4\,ac)d\log\left(cf^{2\,hx+2\,g}+bf^{hx+g}+a\right)-\sqrt{b^2-4\,ac}\,(bd-2\,ae)\log\left(\frac{2\,c^2f^{2\,hx+2\,g}+b^2-2\,ac+2\,\left(bc-\sqrt{b^2-4\,ac}\,c\right)f^{hx+g}-\sqrt{b^2-4\,ac}\,b}{cf^{2\,hx+2\,g}+bf^{hx+g}+a}\right)}{2\,(ab^2-4\,a^2c)h\log(f)},\ \frac{2\,(b^2-4\,ac)dhx\log(f)-(b^2-4\,ac)d\log\left(cf^{2\,hx+2\,g}+bf^{hx+g}+a\right)+2\,\sqrt{-b^2+4\,ac}\,(bd-2\,ae)\arctan\left(-\frac{2\,\sqrt{-b^2+4\,ac}\,cf^{hx+g}+\sqrt{-b^2+4\,ac}\,b}{b^2-4\,ac}\right)}{2\,(ab^2-4\,a^2c)h\log(f)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*f^(h*x+g))/(a+b*f^(h*x+g)+c*f^(2*h*x+2*g)),x, algorithm="fri
cas")
```

```
[Out] [1/2*(2*(b^2 - 4*a*c)*d*h*x*log(f) - (b^2 - 4*a*c)*d*log(c*f^(2*h*x + 2*g)
+ b*f^(h*x + g) + a) - sqrt(b^2 - 4*a*c)*(b*d - 2*a*e)*log((2*c^2*f^(2*h*x
+ 2*g) + b^2 - 2*a*c + 2*(b*c - sqrt(b^2 - 4*a*c)*c)*f^(h*x + g) - sqrt(b^2
 - 4*a*c)*b)/(c*f^(2*h*x + 2*g) + b*f^(h*x + g) + a)))/((a*b^2 - 4*a^2*c)*h
*log(f)), 1/2*(2*(b^2 - 4*a*c)*d*h*x*log(f) - (b^2 - 4*a*c)*d*log(c*f^(2*h*
x + 2*g) + b*f^(h*x + g) + a) + 2*sqrt(-b^2 + 4*a*c)*(b*d - 2*a*e)*arctan(-
(2*sqrt(-b^2 + 4*a*c)*c*f^(h*x + g) + sqrt(-b^2 + 4*a*c)*b)/(b^2 - 4*a*c)))
/((a*b^2 - 4*a^2*c)*h*log(f))]
```

Sympy [A]
time = 0.66, size = 139, normalized size = 1.35

$$\operatorname{RootSum}\left(z^2\cdot\left(4a^2ch^2\log(f)^2-ab^2h^2\log(f)^2\right)+z\left(4acdh\log(f)-b^2dh\log(f)\right)+ae^2-bde+cd^2,\ \left(i\mapsto i\log\left(f^{g+hx}+\frac{4ia^2ch\log(f)-iab^2h\log(f)+abe+2acd-b^2d}{2ace-bcd}\right)\right)\right)+\frac{dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*f**(h*x+g))/(a+b*f**(h*x+g)+c*f**(2*h*x+2*g)),x)
```

```
[Out] RootSum(_z**2*(4*a**2*c*h**2*log(f)**2 - a*b**2*h**2*log(f)**2) + _z*(4*a*c
*d*h*log(f) - b**2*d*h*log(f)) + a*e**2 - b*d*e + c*d**2, Lambda(_i, _i*log
(f**(g + h*x) + (4*_i*a**2*c*h*log(f) - _i*a*b**2*h*log(f) + a*b*e + 2*a*c*
d - b**2*d)/(2*a*c*e - b*c*d)))) + d*x/a
```

Giac [A]
time = 4.15, size = 120, normalized size = 1.17

$$-\frac{\frac{d\log\left(cf^{2\,hx}f^{2\,g}+bf^{hx}f^{g}+a\right)}{a\log(f)}-\frac{2\,d\log\left(|f|^{hx}|f|^{g}\right)}{a\log(f)}+\frac{2\,(bd-2\,ae)\arctan\left(\frac{2\,cf^{hx}f^{g}+b}{\sqrt{-b^{2}+4\,ac}}\right)}{\sqrt{-b^{2}+4\,ac}\,a\log(f)}}{2\,h}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*f^(h*x+g))/(a+b*f^(h*x+g)+c*f^(2*h*x+2*g)),x, algorithm="gia
c")
```

```
[Out] -1/2*(d*log(c*f^(2*h*x)*f^(2*g) + b*f^(h*x)*f^g + a)/(a*log(f)) - 2*d*log(a
bs(f)^(h*x)*abs(f)^g)/(a*log(f)) + 2*(b*d - 2*a*e)*arctan((2*c*f^(h*x)*f^g
+ b)/sqrt(-b^2 + 4*a*c))/(sqrt(-b^2 + 4*a*c)*a*log(f)))/h
```

Mupad [B]
time = 3.81, size = 105, normalized size = 1.02

$$\frac{d\,x}{a}-\frac{d\,\ln\left(a+c\,f^{2\,h\,x}\,f^{2\,g}+b\,f^{h\,x}\,f^{g}\right)}{2\,a\,h\,\ln\left(f\right)}+\frac{\mathrm{atan}\left(\frac{b+2\,c\,f^{h\,x}\,f^{g}}{\sqrt{4\,a\,c-b^{2}}}\right)\,\left(2\,a\,e-b\,d\right)}{a\,h\,\ln\left(f\right)\,\sqrt{4\,a\,c-b^{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*f^(g + h*x))/(a + b*f^(g + h*x) + c*f^(2*g + 2*h*x)),x)
```

```
[Out] (d*x)/a - (d*log(a + c*f^(2*h*x)*f^(2*g) + b*f^(h*x)*f^g))/(2*a*h*log(f)) +
 (atan((b + 2*c*f^(h*x)*f^g)/(4*a*c - b^2)^(1/2))*(2*a*e - b*d))/(a*h*log(f
)*(4*a*c - b^2)^(1/2))
```

3.528 $\int \frac{d+ef^{g+hx}}{a+bf^{g+hx}+cf^{2(g+hx)}}\,dx$

Optimal. Leaf size=103

$$\frac{dx}{a}+\frac{(bd-2ae)\tanh^{-1}\left(\frac{b+2cf^{g+hx}}{\sqrt{b^2-4ac}}\right)}{a\sqrt{b^2-4ac}\,h\log(f)}-\frac{d\log\left(a+bf^{g+hx}+cf^{2g+2hx}\right)}{2ah\log(f)}$$

```
[Out] d*x/a-1/2*d*ln(a+b*f^(h*x+g)+c*f^(2*h*x+2*g))/a/h/ln(f)+(-2*a*e+b*d)*arctan
h((b+2*c*f^(h*x+g))/(-4*a*c+b^2)^(1/2))/a/h/ln(f)/(-4*a*c+b^2)^(1/2)
```

Rubi [A]
time = 0.10, antiderivative size = 103, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {2320, 814, 648, 632, 212, 642}

$$\frac{(bd-2ae)\tanh^{-1}\left(\frac{b+2cf^{g+hx}}{\sqrt{b^2-4ac}}\right)}{ah\log(f)\sqrt{b^2-4ac}}-\frac{d\log\left(a+bf^{g+hx}+cf^{2g+2hx}\right)}{2ah\log(f)}+\frac{dx}{a}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*f^(g + h*x))/(a + b*f^(g + h*x) + c*f^(2*(g + h*x))),x]
```

```
[Out] (d*x)/a + ((b*d - 2*a*e)*ArcTanh[(b + 2*c*f^(g + h*x))/Sqrt[b^2 - 4*a*c]])/
(a*Sqrt[b^2 - 4*a*c]*h*Log[f]) - (d*Log[a + b*f^(g + h*x) + c*f^(2*g + 2*h*
x)])/(2*a*h*Log[f])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 632

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 642

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[d*(Log[RemoveContent[a + b*x + c*x^2, x]]/b), x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 648

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 814

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_.) + (b_.)*(x_) +
(c_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*((f + g*x)/(a +
 b*x + c*x^2)), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[b^2 - 4*a*
c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegerQ[m]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$
\begin{aligned}
\int \frac{d+ef^{g+hx}}{a+bf^{g+hx}+cf^{2(g+hx)}}\,dx &= \frac{\text{Subst}\left(\int \frac{d+ex}{x(a+bx+cx^2)}\,dx,x,f^{g+hx}\right)}{h\log(f)}\\
&= \frac{\text{Subst}\left(\int \left(\frac{d}{ax}+\frac{-bd+ae-cdx}{a(a+bx+cx^2)}\right)\,dx,x,f^{g+hx}\right)}{h\log(f)}\\
&= \frac{dx}{a}+\frac{\text{Subst}\left(\int \frac{-bd+ae-cdx}{a+bx+cx^2}\,dx,x,f^{g+hx}\right)}{ah\log(f)}\\
&= \frac{dx}{a}-\frac{d\text{Subst}\left(\int \frac{b+2cx}{a+bx+cx^2}\,dx,x,f^{g+hx}\right)}{2ah\log(f)}-\frac{(bd-2ae)\text{Subst}\left(\int \frac{1}{a+bx+cx^2}\,dx,x,f}{2ah\log(f)}\\
&= \frac{dx}{a}-\frac{d\log\left(a+bf^{g+hx}+cf^{2g+2hx}\right)}{2ah\log(f)}+\frac{(bd-2ae)\text{Subst}\left(\int \frac{1}{b^2-4ac-x^2}\,dx,x,b+\right.}{ah\log(f)}\\
&= \frac{dx}{a}+\frac{(bd-2ae)\tanh^{-1}\left(\frac{b+2cf^{g+hx}}{\sqrt{b^2-4ac}}\right)}{a\sqrt{b^2-4ac}\,h\log(f)}-\frac{d\log\left(a+bf^{g+hx}+cf^{2g+2hx}\right)}{2ah\log(f)}
\end{aligned}
$$

Mathematica [A]

time = 0.01, size = 118, normalized size = 1.15

$$\frac{(-2bd+4ae)\tan^{-1}\left(\frac{b+2cf^{g+hx}}{\sqrt{-b^2+4ac}}\right)+\sqrt{-b^2+4ac}\,d\left(2\log\left(f^{g+hx}\right)-\log\left(a+f^{g+hx}\left(b+cf^{g+hx}\right)\right)\right)}{2a\sqrt{-b^2+4ac}\,h\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*f^(g + h*x))/(a + b*f^(g + h*x) + c*f^(2*(g + h*x))),x]
```

```
[Out] ((-2*b*d + 4*a*e)*ArcTan[(b + 2*c*f^(g + h*x))/Sqrt[-b^2 + 4*a*c]] + Sqrt[-
b^2 + 4*a*c]*d*(2*Log[f^(g + h*x)] - Log[a + f^(g + h*x)*(b + c*f^(g + h*x)
)]))/(2*a*Sqrt[-b^2 + 4*a*c]*h*Log[f])
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 992 vs. 2(97) = 194.
time = 0.00, size = 993, normalized size = 9.64

method	result
risch	$\frac{4\ln(f)^2 acd\,h^2 x}{4\ln(f)^2 a^2 c\,h^2-\ln(f)^2 a\,b^2 h^2}-\frac{\ln(f)^2 b^2 d\,h^2 x}{4\ln(f)^2 a^2 c\,h^2-\ln(f)^2 a\,b^2 h^2}+\frac{4\ln(f)^2 acdgh}{4\ln(f)^2 a^2 c\,h^2-\ln(f)^2 a\,b^2 h^2}-\frac{\ln(f)^2 b^2 dgh}{4\ln(f)^2 a^2 c\,h^2-\ln(f)^2 a\,b^2 h^2}-$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*f^(h*x+g))/(a+b*f^(h*x+g)+c*f^(2*h*x+2*g)),x,method=_RETURNVERBOSE
)
```

```
[Out] 4/(4*ln(f)^2*a^2*c*h^2-ln(f)^2*a*b^2*h^2)*ln(f)^2*a*c*d*h^2*x-1/(4*ln(f)^2*
a^2*c*h^2-ln(f)^2*a*b^2*h^2)*ln(f)^2*b^2*d*h^2*x+4/(4*ln(f)^2*a^2*c*h^2-ln(
f)^2*a*b^2*h^2)*ln(f)^2*a*c*d*g*h-1/(4*ln(f)^2*a^2*c*h^2-ln(f)^2*a*b^2*h^2)
*ln(f)^2*b^2*d*g*h-2/(4*a*c-b^2)/h/ln(f)*ln(f^(h*x+g)+1/2*(2*b*a*e-b^2*d+(-
16*a^3*c*e^2+4*a^2*b^2*e^2+16*a^2*b*c*d*e-4*a*b^3*d*e-4*a*b^2*c*d^2+b^4*d^2
)^(1/2))/c/(2*a*e-b*d))*c*d+1/2/a/(4*a*c-b^2)/h/ln(f)*ln(f^(h*x+g)+1/2*(2*b
*a*e-b^2*d+(-16*a^3*c*e^2+4*a^2*b^2*e^2+16*a^2*b*c*d*e-4*a*b^3*d*e-4*a*b^2*
c*d^2+b^4*d^2)^(1/2))/c/(2*a*e-b*d))*b^2*d+1/2/a/(4*a*c-b^2)/h/ln(f)*ln(f^(
h*x+g)+1/2*(2*b*a*e-b^2*d+(-16*a^3*c*e^2+4*a^2*b^2*e^2+16*a^2*b*c*d*e-4*a*b
^3*d*e-4*a*b^2*c*d^2+b^4*d^2)^(1/2))/c/(2*a*e-b*d))*(-16*a^3*c*e^2+4*a^2*b^
2*e^2+16*a^2*b*c*d*e-4*a*b^3*d*e-4*a*b^2*c*d^2+b^4*d^2)^(1/2)-2/(4*a*c-b^2)
/h/ln(f)*ln(f^(h*x+g)-1/2*(-2*b*a*e+b^2*d+(-16*a^3*c*e^2+4*a^2*b^2*e^2+16*a
^2*b*c*d*e-4*a*b^3*d*e-4*a*b^2*c*d^2+b^4*d^2)^(1/2))/c/(2*a*e-b*d))*c*d+1/2
/a/(4*a*c-b^2)/h/ln(f)*ln(f^(h*x+g)-1/2*(-2*b*a*e+b^2*d+(-16*a^3*c*e^2+4*a^
2*b^2*e^2+16*a^2*b*c*d*e-4*a*b^3*d*e-4*a*b^2*c*d^2+b^4*d^2)^(1/2))/c/(2*a*e
-b*d))*b^2*d-1/2/a/(4*a*c-b^2)/h/ln(f)*ln(f^(h*x+g)-1/2*(-2*b*a*e+b^2*d+(-1
6*a^3*c*e^2+4*a^2*b^2*e^2+16*a^2*b*c*d*e-4*a*b^3*d*e-4*a*b^2*c*d^2+b^4*d^2)
^(1/2))/c/(2*a*e-b*d))*(-16*a^3*c*e^2+4*a^2*b^2*e^2+16*a^2*b*c*d*e-4*a*b^3*
d*e-4*a*b^2*c*d^2+b^4*d^2)^(1/2)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*f^(h*x+g))/(a+b*f^(h*x+g)+c*f^(2*h*x+2*g)),x, algorithm="max
ima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re deta
```

Fricas [A]
time = 0.40, size = 332, normalized size = 3.22

$$\left[\frac{2\,(b^2-4\,ac)dhx\log\left(f\right)-(b^2-4\,ac)d\log\left(cf^{2\,hx+2\,g}+bf^{hx+g}+a\right)-\sqrt{b^2-4\,ac}\,(bd-2\,ae)\log\left(\frac{2\,c^2f^{2\,hx+2\,g}+b^2-2\,ac+2\left(bc-\sqrt{b^2-4\,ac}\,c\right)f^{hx+g}-\sqrt{b^2-4\,ac}\,b}{cf^{2\,hx+2\,g}+bf^{hx+g}+a}\right)}{2\,(ab^2-4\,a^2c)h\log\left(f\right)},\ \frac{2\,(b^2-4\,ac)dhx\log\left(f\right)-(b^2-4\,ac)d\log\left(cf^{2\,hx+2\,g}+bf^{hx+g}+a\right)+2\,\sqrt{-b^2+4\,ac}\,(bd-2\,ae)\arctan\left(-\frac{2\,\sqrt{-b^2+4\,ac}\,cf^{hx+g}+\sqrt{-b^2+4\,ac}\,b}{b^2-4\,ac}\right)}{2\,(ab^2-4\,a^2c)h\log\left(f\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*f^(h*x+g))/(a+b*f^(h*x+g)+c*f^(2*h*x+2*g)),x, algorithm="fri
cas")
```

```
[Out] [1/2*(2*(b^2 - 4*a*c)*d*h*x*log(f) - (b^2 - 4*a*c)*d*log(c*f^(2*h*x + 2*g)
 + b*f^(h*x + g) + a) - sqrt(b^2 - 4*a*c)*(b*d - 2*a*e)*log((2*c^2*f^(2*h*x
 + 2*g) + b^2 - 2*a*c + 2*(b*c - sqrt(b^2 - 4*a*c)*c)*f^(h*x + g) - sqrt(b^2
 - 4*a*c)*b)/(c*f^(2*h*x + 2*g) + b*f^(h*x + g) + a)))/((a*b^2 - 4*a^2*c)*h
*log(f)), 1/2*(2*(b^2 - 4*a*c)*d*h*x*log(f) - (b^2 - 4*a*c)*d*log(c*f^(2*h*
x + 2*g) + b*f^(h*x + g) + a) + 2*sqrt(-b^2 + 4*a*c)*(b*d - 2*a*e)*arctan(-
(2*sqrt(-b^2 + 4*a*c)*c*f^(h*x + g) + sqrt(-b^2 + 4*a*c)*b)/(b^2 - 4*a*c)))
/((a*b^2 - 4*a^2*c)*h*log(f))]
```

Sympy [A]
time = 0.64, size = 139, normalized size = 1.35

$$\operatorname{RootSum}\left(z^{2}\cdot\left(4a^{2}ch^{2}\log\left(f\right)^{2}-ab^{2}h^{2}\log\left(f\right)^{2}\right)+z\left(4acdh\log\left(f\right)-b^{2}dh\log\left(f\right)\right)+ae^{2}-bde+cd^{2},\left(i\mapsto i\log\left(f^{g+hx}+\frac{4ia^{2}ch\log\left(f\right)-iab^{2}h\log\left(f\right)+abe+2acd-b^{2}d}{2ace-bcd}\right)\right)\right)+\frac{dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*f**(h*x+g))/(a+b*f**(h*x+g)+c*f**(2*h*x+2*g)),x)
```

```
[Out] RootSum(_z**2*(4*a**2*c*h**2*log(f)**2 - a*b**2*h**2*log(f)**2) + _z*(4*a*c
*d*h*log(f) - b**2*d*h*log(f)) + a*e**2 - b*d*e + c*d**2, Lambda(_i, _i*log
(f**(g + h*x) + (4*_i*a**2*c*h*log(f) - _i*a*b**2*h*log(f) + a*b*e + 2*a*c*
d - b**2*d)/(2*a*c*e - b*c*d)))) + d*x/a
```

Giac [A]
time = 6.04, size = 120, normalized size = 1.17

$$-\frac{\frac{d\log\left(cf^{2\,hx}f^{2\,g}+bf^{hx}f^{g}+a\right)}{a\log(f)}-\frac{2\,d\log\left(|f|^{hx}|f|^{g}\right)}{a\log(f)}+\frac{2\,(bd-2\,ae)\arctan\left(\frac{2\,cf^{hx}f^{g}+b}{\sqrt{-b^{2}+4\,ac}}\right)}{\sqrt{-b^{2}+4\,ac}\,a\log(f)}}{2\,h}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*f^(h*x+g))/(a+b*f^(h*x+g)+c*f^(2*h*x+2*g)),x, algorithm="gia
c")
```

```
[Out] -1/2*(d*log(c*f^(2*h*x)*f^(2*g) + b*f^(h*x)*f^g + a)/(a*log(f)) - 2*d*log(a
bs(f)^(h*x)*abs(f)^g)/(a*log(f)) + 2*(b*d - 2*a*e)*arctan((2*c*f^(h*x)*f^g
+ b)/sqrt(-b^2 + 4*a*c))/(sqrt(-b^2 + 4*a*c)*a*log(f)))/h
```

Mupad [B]
time = 0.00, size = 105, normalized size = 1.02

$$\frac{d\,x}{a}-\frac{d\,\ln\left(a+c\,f^{2\,h\,x}\,f^{2\,g}+b\,f^{h\,x}\,f^{g}\right)}{2\,a\,h\,\ln\left(f\right)}+\frac{\mathrm{atan}\left(\frac{b+2\,c\,f^{h\,x}\,f^{g}}{\sqrt{4\,a\,c-b^{2}}}\right)\,\left(2\,a\,e-b\,d\right)}{a\,h\,\ln\left(f\right)\,\sqrt{4\,a\,c-b^{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*f^(g + h*x))/(a + b*f^(g + h*x) + c*f^(2*g + 2*h*x)),x)
```

```
[Out] (d*x)/a - (d*log(a + c*f^(2*h*x)*f^(2*g) + b*f^(h*x)*f^g))/(2*a*h*log(f)) +
 (atan((b + 2*c*f^(h*x)*f^g)/(4*a*c - b^2)^(1/2))*(2*a*e - b*d))/(a*h*log(f
)*(4*a*c - b^2)^(1/2))
```

3.529 $\int \frac{1}{2+e^{-x}+e^x} \, dx$

Optimal. Leaf size=9

$$-\frac{1}{1+e^x}$$

```
[Out] -1/(1+exp(x))
```

Rubi [A]
time = 0.01, antiderivative size = 9, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {2320, 32}

$$-\frac{1}{e^x+1}$$

Antiderivative was successfully verified.

```
[In] Int[(2 + E^(-x) + E^x)^(-1),x]
```

```
[Out] -(1 + E^x)^(-1)
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned} \int \frac{1}{2+e^{-x}+e^x} \, dx &= \text{Subst}\left(\int \frac{1}{(1+x)^2} \, dx, x, e^x\right) \\ &= -\frac{1}{1+e^x} \end{aligned}$$

Mathematica [A]
time = 0.01, size = 9, normalized size = 1.00

$$\frac{1}{-1-e^x}$$

Antiderivative was successfully verified.

```
[In] Integrate[(2 + E^(-x) + E^x)^(-1),x]
```

```
[Out] (-1 - E^x)^(-1)
```

Maple [A]
time = 0.01, size = 9, normalized size = 1.00

method	result	size
default	$-\frac{1}{1+e^{x}}$	9
norman	$-\frac{1}{1+e^{x}}$	9
risch	$-\frac{1}{1+e^{x}}$	9

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(2+exp(-x)+exp(x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/(1+exp(x))
```

Maxima [A]
time = 0.28, size = 8, normalized size = 0.89

$$\frac{1}{e^{(-x)} + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+exp(-x)+exp(x)),x, algorithm="maxima")
```

```
[Out] 1/(e^(-x) + 1)
```

Fricas [A]
time = 0.38, size = 8, normalized size = 0.89

$$-\frac{1}{e^{x} + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+exp(-x)+exp(x)),x, algorithm="fricas")
```

```
[Out] -1/(e^x + 1)
```

Sympy [A]
time = 0.02, size = 7, normalized size = 0.78

$$-\frac{1}{e^{x} + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+exp(-x)+exp(x)),x)
```

```
[Out] -1/(exp(x) + 1)
```

Giac [A]
time = 2.88, size = 8, normalized size = 0.89

$$-\frac{1}{e^x+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+exp(-x)+exp(x)),x, algorithm="giac")
```

```
[Out] -1/(e^x + 1)
```

Mupad [B]
time = 0.06, size = 8, normalized size = 0.89

$$-\frac{1}{\mathrm{e}^x+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(exp(-x) + exp(x) + 2),x)
```

```
[Out] -1/(exp(x) + 1)
```

3.530 $\int \frac{x}{2+e^{-x}+e^x}\,dx$

Optimal. Leaf size=20

$$x-\frac{x}{1+e^x}-\log\left(1+e^x\right)$$

[Out] x-x/(1+exp(x))-ln(1+exp(x))

Rubi [A]
time = 0.09, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {2299, 6820, 2222, 2320, 36, 29, 31}

$$-\frac{x}{e^x+1}+x-\log\left(e^x+1\right)$$

Antiderivative was successfully verified.

[In] Int[x/(2 + E^(-x) + E^x),x]

[Out] x - x/(1 + E^x) - Log[1 + E^x]

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 2222

```
Int[((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((a_.) + (b_.)*((F_)^((g_.)*(
(e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :>
 Simp[(c + d*x)^m*((a + b*(F^(g*(e + f*x)))^n)^(p + 1)/(b*f*g*n*(p + 1)*Log
[F])), x] - Dist[d*(m/(b*f*g*n*(p + 1)*Log[F])), Int[(c + d*x)^(m - 1)*(a +
 b*(F^(g*(e + f*x)))^n)^(p + 1), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m
, n, p}, x] && NeQ[p, -1]
```

Rule 2299

```
Int[(u_)/((a_) + (b_.)*(F_)^(v_) + (c_.)*(F_)^(w_)), x_Symbol] :> Int[u*(F^
v/(c + a*F^v + b*F^(2*v))), x] /; FreeQ[{F, a, b, c}, x] && EqQ[w, -v] && L
```

```
inearQ[v, x] && If[RationalQ[Coefficient[v, x, 1]], GtQ[Coefficient[v, x, 1
], 0], LtQ[LeafCount[v], LeafCount[w]]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6820

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rubi steps

$$\begin{aligned}
\int \frac{x}{2+e^{-x}+e^x}\,dx &= \int \frac{e^x x}{1+2e^x+e^{2x}}\,dx\\
&= \int \frac{e^x x}{(1+e^x)^2}\,dx\\
&= -\frac{x}{1+e^x}+\int \frac{1}{1+e^x}\,dx\\
&= -\frac{x}{1+e^x}+\text{Subst}\left(\int \frac{1}{x(1+x)}\,dx,x,e^x\right)\\
&= -\frac{x}{1+e^x}+\text{Subst}\left(\int \frac{1}{x}\,dx,x,e^x\right)-\text{Subst}\left(\int \frac{1}{1+x}\,dx,x,e^x\right)\\
&= x-\frac{x}{1+e^x}-\log\left(1+e^x\right)
\end{aligned}$$

Mathematica [A]
time = 0.03, size = 20, normalized size = 1.00

$$x-\frac{x}{1+e^x}-\log\left(1+e^x\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(2 + E^(-x) + E^x),x]
[Out] x - x/(1 + E^x) - Log[1 + E^x]
```

Maple [A]
time = 0.02, size = 19, normalized size = 0.95

method	result	size
default	$-\ln(1+e^x)+\frac{x e^x}{1+e^x}$	19
norman	$-\ln(1+e^x)+\frac{x e^x}{1+e^x}$	19
risch	$x-\frac{x}{1+e^x}-\ln(1+e^x)$	19

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(2+exp(-x)+exp(x)),x,method=_RETURNVERBOSE)
[Out] -ln(1+exp(x))+x*exp(x)/(1+exp(x))
```

Maxima [A]
time = 0.28, size = 18, normalized size = 0.90

$$\frac{xe^x}{e^x+1}-\log(e^x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(2+exp(-x)+exp(x)),x, algorithm="maxima")
[Out] x*e^x/(e^x + 1) - log(e^x + 1)
```

Fricas [A]
time = 0.42, size = 23, normalized size = 1.15

$$\frac{xe^x-(e^x+1)\log(e^x+1)}{e^x+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(2+exp(-x)+exp(x)),x, algorithm="fricas")
[Out] (x*e^x - (e^x + 1)*log(e^x + 1))/(e^x + 1)
```

Sympy [A]
time = 0.03, size = 14, normalized size = 0.70

$$x-\frac{x}{e^x+1}-\log(e^x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(2+exp(-x)+exp(x)),x)
[Out] x - x/(exp(x) + 1) - log(exp(x) + 1)
```

Giac [A]
time = 4.94, size = 28, normalized size = 1.40

$$\frac{xe^x-e^x\log(e^x+1)-\log(e^x+1)}{e^x+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(2+exp(-x)+exp(x)),x, algorithm="giac")
[Out] (x*e^x - e^x*log(e^x + 1) - log(e^x + 1))/(e^x + 1)
```

Mupad [B]
time = 0.06, size = 18, normalized size = 0.90

$$\frac{x\,\mathrm{e}^x}{\mathrm{e}^x+1}-\ln\left(\mathrm{e}^x+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(exp(-x) + exp(x) + 2),x)
[Out] (x*exp(x))/(exp(x) + 1) - log(exp(x) + 1)
```

3.531 $\int \frac{x^2}{2+e^{-x}+e^x} \, dx$

Optimal. Leaf size=34

$$x^2 - \frac{x^2}{1+e^x} - 2x\log(1+e^x) - 2\text{Li}_2(-e^x)$$

[Out] x^2-x^2/(1+exp(x))-2*x*ln(1+exp(x))-2*polylog(2,-exp(x))

Rubi [A]
time = 0.17, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.438$, Rules used = {2299, 6820, 2222, 2215, 2221, 2317, 2438}

$$-2\text{PolyLog}(2,-e^x) - \frac{x^2}{e^x+1} + x^2 - 2x\log(e^x+1)$$

Antiderivative was successfully verified.

[In] Int[x^2/(2 + E^(-x) + E^x),x]

[Out] x^2 - x^2/(1 + E^x) - 2*x*Log[1 + E^x] - 2*PolyLog[2, -E^x]

Rule 2215

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[(c + d*x)^m*((F^(g*(e + f*x)))^n/(a + b*(F^(g*(e + f*x)))^n)), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2222

```
Int[((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((a_.) + (b_.)*((F_)^((g_.)*(
(e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :>
 Simp[(c + d*x)^m*((a + b*(F^(g*(e + f*x)))^n)^(p + 1)/(b*f*g*n*(p + 1)*Log
[F])), x] - Dist[d*(m/(b*f*g*n*(p + 1)*Log[F])), Int[(c + d*x)^(m - 1)*(a +
 b*(F^(g*(e + f*x)))^n)^(p + 1), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m
, n, p}, x] && NeQ[p, -1]
```

Rule 2299

```
Int[(u_)/((a_) + (b_.)*(F_)^(v_) + (c_.)*(F_)^(w_)), x_Symbol] :> Int[u*(F^
v/(c + a*F^v + b*F^(2*v))), x] /; FreeQ[{F, a, b, c}, x] && EqQ[w, -v] && L
inearQ[v, x] && If[RationalQ[Coefficient[v, x, 1]], GtQ[Coefficient[v, x, 1
], 0], LtQ[LeafCount[v], LeafCount[w]]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6820

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2}{2+e^{-x}+e^x}\,dx &= \int \frac{e^x x^2}{1+2e^x+e^{2x}}\,dx \\
&= \int \frac{e^x x^2}{(1+e^x)^2}\,dx \\
&= -\frac{x^2}{1+e^x}+2\int \frac{x}{1+e^x}\,dx \\
&= x^2-\frac{x^2}{1+e^x}-2\int \frac{e^x x}{1+e^x}\,dx \\
&= x^2-\frac{x^2}{1+e^x}-2x\log\left(1+e^x\right)+2\int \log\left(1+e^x\right)\,dx \\
&= x^2-\frac{x^2}{1+e^x}-2x\log\left(1+e^x\right)+2\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx,x,e^x\right) \\
&= x^2-\frac{x^2}{1+e^x}-2x\log\left(1+e^x\right)-2\text{Li}_2(-e^x)
\end{aligned}$$

Mathematica [**A**]

time = 0.05, size = 33, normalized size = 0.97

$$x\left(\frac{e^x x}{1+e^x}-2\log\left(1+e^x\right)\right)-2\text{Li}_2(-e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(2 + E^(-x) + E^x),x]
[Out] x*((E^x*x)/(1 + E^x) - 2*Log[1 + E^x]) - 2*PolyLog[2, -E^x]
```

Maple [A]
time = 0.02, size = 32, normalized size = 0.94

method	result	size
risch	$x^2-\frac{x^2}{1+e^x}-2x\ln\left(1+e^x\right)-2\,\text{polylog}\left(2,-e^x\right)$	32

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(2+exp(-x)+exp(x)),x,method=_RETURNVERBOSE)
[Out] x^2-x^2/(1+exp(x))-2*x*ln(1+exp(x))-2*polylog(2,-exp(x))
```

Maxima [A]
time = 0.28, size = 30, normalized size = 0.88

$$x^2-2\,x\log\left(e^x+1\right)-\frac{x^2}{e^x+1}-2\,\text{Li}_2(-e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(2+exp(-x)+exp(x)),x, algorithm="maxima")
[Out] x^2 - 2*x*log(e^x + 1) - x^2/(e^x + 1) - 2*dilog(-e^x)
```

Fricas [A]
time = 0.36, size = 38, normalized size = 1.12

$$\frac{x^2e^x-2\left(e^x+1\right)\text{Li}_2(-e^x)-2\left(xe^x+x\right)\log\left(e^x+1\right)}{e^x+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(2+exp(-x)+exp(x)),x, algorithm="fricas")
[Out] (x^2*e^x - 2*(e^x + 1)*dilog(-e^x) - 2*(x*e^x + x)*log(e^x + 1))/(e^x + 1)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{x^2}{e^x+1}+2\int\frac{x}{e^x+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(2+exp(-x)+exp(x)),x)
[Out] -x**2/(exp(x) + 1) + 2*Integral(x/(exp(x) + 1), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(2+exp(-x)+exp(x)),x, algorithm="giac")
[Out] integrate(x^2/(e^(-x) + e^x + 2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^2}{\mathrm{e}^{-x}+\mathrm{e}^x+2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(exp(-x) + exp(x) + 2),x)
[Out] int(x^2/(exp(-x) + exp(x) + 2), x)
```

3.532 $\int \frac{1}{2+f^{-c-dx}+f^{c+dx}}\,dx$

Optimal. Leaf size=20

$$-\frac{1}{d\left(1+f^{c+dx}\right)\log(f)}$$

```
[Out] -1/d/(1+f^(d*x+c))/ln(f)
```

Rubi [A]
time = 0.01, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2320, 32}

$$-\frac{1}{d\log(f)\left(f^{c+dx}+1\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(2 + f^(-c - d*x) + f^(c + d*x))^(-1),x]
```

```
[Out] -(1/(d*(1 + f^(c + d*x))*Log[f]))
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{2+f^{-c-dx}+f^{c+dx}}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{(1+x)^2}\,dx, x, f^{c+dx}\right)}{d\log(f)}\\ &= -\frac{1}{d\left(1+f^{c+dx}\right)\log(f)}\end{aligned}$$

Mathematica [A]
time = 0.03, size = 20, normalized size = 1.00

$$-\frac{1}{d\log(f)+df^{c+dx}\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(2 + f^(-c - d*x) + f^(c + d*x))^(-1),x]
[Out] -(d*Log[f] + d*f^(c + d*x)*Log[f])^(-1)
```

Maple [A]
time = 0.01, size = 23, normalized size = 1.15

method	result	size
risch	$\frac{1}{d\ln(f)\left(f^{-dx-c}+1\right)}$	23
norman	$\frac{1}{d\ln(f)\left(\mathrm{e}^{(-dx-c)\ln(f)}+1\right)}$	25

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(2+f^(-d*x-c)+f^(d*x+c)),x,method=_RETURNVERBOSE)
[Out] 1/d/ln(f)/(f^(-d*x-c)+1)
```

Maxima [A]
time = 0.28, size = 22, normalized size = 1.10

$$\frac{1}{d(f^{-dx-c}+1)\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+f^(-d*x-c)+f^(d*x+c)),x, algorithm="maxima")
[Out] 1/(d*(f^(-d*x - c) + 1)*log(f))
```

Fricas [A]
time = 0.37, size = 20, normalized size = 1.00

$$-\frac{1}{df^{dx+c}\log(f)+d\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+f^(-d*x-c)+f^(d*x+c)),x, algorithm="fricas")
[Out] -1/(d*f^(d*x + c)*log(f) + d*log(f))
```

Sympy [A]
time = 0.04, size = 19, normalized size = 0.95

$$-\frac{1}{df^{c+dx}\log(f)+d\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+f**(-d*x-c)+f**(d*x+c)),x)
```

```
[Out] -1/(d*f**(c + d*x)*log(f) + d*log(f))
```

Giac [**A**]
time = 3.93, size = 22, normalized size = 1.10

$$-\frac{1}{(f^{dx}f^c+1)d\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+f^(-d*x-c)+f^(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/((f^(d*x)*f^c + 1)*d*log(f))
```

Mupad [**B**]
time = 3.56, size = 20, normalized size = 1.00

$$-\frac{1}{d\ln(f)\,(f^{c+d\,x}+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(1/f^(c + d*x) + f^(c + d*x) + 2),x)
```

```
[Out] -1/(d*log(f)*(f^(c + d*x) + 1))
```

3.533 $\int \frac{x}{2+f^{-c-dx}+f^{c+dx}}\,dx$

Optimal. Leaf size=50

$$\frac{x}{d\log(f)}-\frac{x}{d\left(1+f^{c+dx}\right)\log(f)}-\frac{\log\left(1+f^{c+dx}\right)}{d^2\log^2(f)}$$

[Out] x/d/ln(f)-x/d/(1+f^(d*x+c))/ln(f)-ln(1+f^(d*x+c))/d^2/ln(f)^2

Rubi [A]
time = 0.20, antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {2299, 6820, 2222, 2320, 36, 29, 31}

$$-\frac{\log\left(f^{c+dx}+1\right)}{d^2\log^2(f)}-\frac{x}{d\log(f)\left(f^{c+dx}+1\right)}+\frac{x}{d\log(f)}$$

Antiderivative was successfully verified.

[In] Int[x/(2 + f^(-c - d*x) + f^(c + d*x)),x]

[Out] x/(d*Log[f]) - x/(d*(1 + f^(c + d*x))*Log[f]) - Log[1 + f^(c + d*x)]/(d^2*L
og[f]^2)

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 2222

```
Int[((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((a_.) + (b_.)*((F_)^((g_.)*(
(e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :>
 Simp[(c + d*x)^m*((a + b*(F^(g*(e + f*x)))^n)^(p + 1)/(b*f*g*n*(p + 1)*Log
[F])), x] - Dist[d*(m/(b*f*g*n*(p + 1)*Log[F])), Int[(c + d*x)^(m - 1)*(a +
 b*(F^(g*(e + f*x)))^n)^(p + 1), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m
, n, p}, x] && NeQ[p, -1]
```

Rule 2299

```
Int[(u_)/((a_) + (b_.)*(F_)^(v_) + (c_.)*(F_)^(w_)), x_Symbol] :> Int[u*(F^
v/(c + a*F^v + b*F^(2*v))), x] /; FreeQ[{F, a, b, c}, x] && EqQ[w, -v] && L
inearQ[v, x] && If[RationalQ[Coefficient[v, x, 1]], GtQ[Coefficient[v, x, 1
], 0], LtQ[LeafCount[v], LeafCount[w]]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6820

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rubi steps

$$
\begin{aligned}
\int \frac{x}{2+f^{-c-dx}+f^{c+dx}}\,dx &= \int \frac{f^{c+dx}x}{1+2f^{c+dx}+f^{2(c+dx)}}\,dx\\
&= \int \frac{f^{c+dx}x}{\left(1+f^{c+dx}\right)^2}\,dx\\
&= -\frac{x}{d\left(1+f^{c+dx}\right)\log(f)}+\frac{\int \frac{1}{1+f^{c+dx}}\,dx}{d\log(f)}\\
&= -\frac{x}{d\left(1+f^{c+dx}\right)\log(f)}+\frac{\text{Subst}\left(\int \frac{1}{x(1+x)}\,dx,x,f^{c+dx}\right)}{d^2\log^2(f)}\\
&= -\frac{x}{d\left(1+f^{c+dx}\right)\log(f)}+\frac{\text{Subst}\left(\int \frac{1}{x}\,dx,x,f^{c+dx}\right)}{d^2\log^2(f)}-\frac{\text{Subst}\left(\int \frac{1}{1+x}\,dx,x,f^{c+dx}\right)}{d^2\log^2(f)}\\
&= \frac{x}{d\log(f)}-\frac{x}{d\left(1+f^{c+dx}\right)\log(f)}-\frac{\log\left(1+f^{c+dx}\right)}{d^2\log^2(f)}
\end{aligned}
$$

Mathematica [A]
time = 0.08, size = 44, normalized size = 0.88

$$
\frac{\frac{df^{c+dx}x\log(f)}{1+f^{c+dx}}-\log\left(1+f^{c+dx}\right)}{d^2\log^2(f)}
$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(2 + f^(-c - d*x) + f^(c + d*x)),x]
```

```
[Out] ((d*f^(c + d*x)*x*Log[f])/(1 + f^(c + d*x)) - Log[1 + f^(c + d*x)])/(d^2*Lo
g[f]^2)
```

Maple [A]
time = 0.02, size = 64, normalized size = 1.28

method	result	size
norman	$-\frac{x\,\mathrm{e}^{(-dx-c)\ln(f)}}{d\ln(f)\left(\mathrm{e}^{(-dx-c)\ln(f)}+1\right)}-\frac{\ln\left(\mathrm{e}^{(-dx-c)\ln(f)}+1\right)}{d^2\ln(f)^2}$	64
risch	$-\frac{x}{d\ln(f)}-\frac{c}{d^2\ln(f)}+\frac{x}{d\ln(f)\left(f^{-dx-c}+1\right)}-\frac{\ln\left(f^{-dx-c}+1\right)}{d^2\ln(f)^2}$	67

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(2+f^(-d*x-c)+f^(d*x+c)),x,method=_RETURNVERBOSE)
```

```
[Out] -x/d/ln(f)*exp((-d*x-c)*ln(f))/(exp((-d*x-c)*ln(f))+1)-1/d^2/ln(f)^2*ln(exp
((-d*x-c)*ln(f))+1)
```

Maxima [A]
time = 0.28, size = 57, normalized size = 1.14

$$\frac{f^{dx}f^{c}x}{df^{dx}f^{c}\log\left(f\right)+d\log\left(f\right)}-\frac{\log\left(\frac{f^{dx}f^{c}+1}{f^{c}}\right)}{d^2\log\left(f\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(2+f^(-d*x-c)+f^(d*x+c)),x, algorithm="maxima")
```

```
[Out] f^(d*x)*f^c*x/(d*f^(d*x)*f^c*log(f) + d*log(f)) - log((f^(d*x)*f^c + 1)/f^c
)/(d^2*log(f)^2)
```

Fricas [A]
time = 0.35, size = 61, normalized size = 1.22

$$\frac{df^{dx+c}x\log\left(f\right)-\left(f^{dx+c}+1\right)\log\left(f^{dx+c}+1\right)}{d^2f^{dx+c}\log\left(f\right)^2+d^2\log\left(f\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(2+f^(-d*x-c)+f^(d*x+c)),x, algorithm="fricas")
```

```
[Out] (d*f^(d*x + c)*x*log(f) - (f^(d*x + c) + 1)*log(f^(d*x + c) + 1))/(d^2*f^(d
*x + c)*log(f)^2 + d^2*log(f)^2)
```

Sympy [A]
time = 0.06, size = 42, normalized size = 0.84

$$-\frac{x}{df^{c+dx}\log(f)+d\log(f)}+\frac{x}{d\log(f)}-\frac{\log\left(f^{c+dx}+1\right)}{d^2\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(2+f**(-d*x-c)+f**(d*x+c)),x)
```

```
[Out] -x/(d*f**(c + d*x)*log(f) + d*log(f)) + x/(d*log(f)) - log(f**(c + d*x) + 1
)/(d**2*log(f)**2)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(2+f^(-d*x-c)+f^(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(x/(f^(d*x + c) + f^(-d*x - c) + 2), x)
```

Mupad [B]
time = 3.62, size = 52, normalized size = 1.04

$$\frac{f^{d\,x}\,f^c\,x}{d\,\ln(f)\,\left(f^{d\,x}\,f^c+1\right)}-\frac{\ln\left(f^{d\,x}\,f^c+1\right)}{d^2\ln(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(1/f^(c + d*x) + f^(c + d*x) + 2),x)
```

```
[Out] (f^(d*x)*f^c*x)/(d*log(f)*(f^(d*x)*f^c + 1)) - log(f^(d*x)*f^c + 1)/(d^2*lo
g(f)^2)
```

3.534 $\int \frac{x^2}{2+f^{-c-dx}+f^{c+dx}}\,dx$

Optimal. Leaf size=75

$$\frac{x^2}{d\log(f)}-\frac{x^2}{d\left(1+f^{c+dx}\right)\log(f)}-\frac{2x\log\left(1+f^{c+dx}\right)}{d^2\log^2(f)}-\frac{2\text{Li}_2\left(-f^{c+dx}\right)}{d^3\log^3(f)}$$

```
[Out] x^2/d/ln(f)-x^2/d/(1+f^(d*x+c))/ln(f)-2*x*ln(1+f^(d*x+c))/d^2/ln(f)^2-2*pol
ylog(2,-f^(d*x+c))/d^3/ln(f)^3
```

Rubi [A]
time = 0.33, antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}=0.280$, Rules used = {2299, 6820, 2222, 2215, 2221, 2317, 2438}

$$-\frac{2\text{PolyLog}\left(2,-f^{c+dx}\right)}{d^3\log^3(f)}-\frac{2x\log\left(f^{c+dx}+1\right)}{d^2\log^2(f)}-\frac{x^2}{d\log(f)\left(f^{c+dx}+1\right)}+\frac{x^2}{d\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(2 + f^(-c - d*x) + f^(c + d*x)),x]
```

```
[Out] x^2/(d*Log[f]) - x^2/(d*(1 + f^(c + d*x))*Log[f]) - (2*x*Log[1 + f^(c + d*x
)])/(d^2*Log[f]^2) - (2*PolyLog[2, -f^(c + d*x)])/(d^3*Log[f]^3)
```

Rule 2215

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[(c + d*x)^m*((F^(g*(e + f*x)))^n/(a + b*(F^(g*(e + f*x)))^n)), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2222

```
Int[((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((a_.) + (b_.)*((F_)^((g_.)*(
(e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :>
 Simp[(c + d*x)^m*((a + b*(F^(g*(e + f*x)))^n)^(p + 1)/(b*f*g*n*(p + 1)*Log
[F])), x] - Dist[d*(m/(b*f*g*n*(p + 1)*Log[F])), Int[(c + d*x)^(m - 1)*(a +
 b*(F^(g*(e + f*x)))^n)^(p + 1), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m
```

```
, n, p}, x] && NeQ[p, -1]
```

Rule 2299

```
Int[(u_)/((a_) + (b_.)*(F_)^(v_) + (c_.)*(F_)^(w_)), x_Symbol] :> Int[u*(F^
v/(c + a*F^v + b*F^(2*v))), x] /; FreeQ[{F, a, b, c}, x] && EqQ[w, -v] && L
inearQ[v, x] && If[RationalQ[Coefficient[v, x, 1]], GtQ[Coefficient[v, x, 1
], 0], LtQ[LeafCount[v], LeafCount[w]]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6820

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rubi steps

$$
\begin{aligned}
\int \frac{x^2}{2+f^{-c-dx}+f^{c+dx}}\,dx &= \int \frac{f^{c+dx}x^2}{1+2f^{c+dx}+f^{2(c+dx)}}\,dx \\
&= \int \frac{f^{c+dx}x^2}{\left(1+f^{c+dx}\right)^2}\,dx \\
&= -\frac{x^2}{d\left(1+f^{c+dx}\right)\log(f)}+\frac{2\int \frac{x}{1+f^{c+dx}}\,dx}{d\log(f)} \\
&= \frac{x^2}{d\log(f)}-\frac{x^2}{d\left(1+f^{c+dx}\right)\log(f)}-\frac{2\int \frac{f^{c+dx}x}{1+f^{c+dx}}\,dx}{d\log(f)} \\
&= \frac{x^2}{d\log(f)}-\frac{x^2}{d\left(1+f^{c+dx}\right)\log(f)}-\frac{2x\log\left(1+f^{c+dx}\right)}{d^2\log^2(f)}+\frac{2\int \log\left(1+f^{c+dx}\right)\,dx}{d^2\log^2(f)} \\
&= \frac{x^2}{d\log(f)}-\frac{x^2}{d\left(1+f^{c+dx}\right)\log(f)}-\frac{2x\log\left(1+f^{c+dx}\right)}{d^2\log^2(f)}+\frac{2\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx,x\right.}{d^3\log^3(f)} \\
&= \frac{x^2}{d\log(f)}-\frac{x^2}{d\left(1+f^{c+dx}\right)\log(f)}-\frac{2x\log\left(1+f^{c+dx}\right)}{d^2\log^2(f)}-\frac{2\text{Li}_2\left(-f^{c+dx}\right)}{d^3\log^3(f)}
\end{aligned}
$$

Mathematica [A]
time = 0.12, size = 63, normalized size = 0.84

$$\frac{dx\log(f)\left(\frac{df^{c+dx}x\log(f)}{1+f^{c+dx}}-2\log\left(1+f^{c+dx}\right)\right)-2\text{Li}_2\left(-f^{c+dx}\right)}{d^3\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(2 + f^(-c - d*x) + f^(c + d*x)),x]
```

```
[Out] (d*x*Log[f]*((d*f^(c + d*x)*x*Log[f])/(1 + f^(c + d*x)) - 2*Log[1 + f^(c +
d*x)]) - 2*PolyLog[2, -f^(c + d*x)])/(d^3*Log[f]^3)
```

Maple [A]
time = 0.04, size = 134, normalized size = 1.79

method	result
risch	$\frac{x^2}{d\ln(f)\left(f^{-dx-c}+1\right)}-\frac{x^2}{d\ln(f)}-\frac{2cx}{d^2\ln(f)}-\frac{c^2}{d^3\ln(f)}-\frac{2\ln\left(1+f^{-dx}f^{-c}\right)x}{\ln(f)^2d^2}+\frac{2\,\text{polylog}\left(2,-f^{-dx}f^{-c}\right)}{\ln(f)^3d^3}-\frac{2c\ln\left(f^{-dx}f^{-c}\right)}{\ln(f)^2d^3}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(2+f^(-d*x-c)+f^(d*x+c)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d/ln(f)*x^2/(f^(-d*x-c)+1)-x^2/d/ln(f)-2/d^2/ln(f)*c*x-1/d^3/ln(f)*c^2-2/
ln(f)^2/d^2*ln(1+f^(-d*x)*f^(-c))*x+2/ln(f)^3/d^3*polylog(2,-f^(-d*x)*f^(-c
))-2/ln(f)^2/d^3*c*ln(f^(-d*x)*f^(-c))
```

Maxima [A]
time = 0.29, size = 74, normalized size = 0.99

$$-\frac{x^2}{df^{dx}f^c\log(f)+d\log(f)}+\frac{x^2}{d\log(f)}-\frac{2\left(dx\log\left(f^{dx}f^c+1\right)\log(f)+\text{Li}_2\left(-f^{dx}f^c\right)\right)}{d^3\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(2+f^(-d*x-c)+f^(d*x+c)),x, algorithm="maxima")
```

```
[Out] -x^2/(d*f^(d*x)*f^c*log(f) + d*log(f)) + x^2/(d*log(f)) - 2*(d*x*log(f^(d*x
)*f^c + 1)*log(f) + dilog(-f^(d*x)*f^c))/(d^3*log(f)^3)
```

Fricas [A]
time = 0.42, size = 114, normalized size = 1.52

$$-\frac{c^2\log(f)^2-\left(d^2x^2-c^2\right)f^{dx+c}\log(f)^2+2\left(f^{dx+c}+1\right)\text{Li}_2\left(-f^{dx+c}\right)+2\left(df^{dx+c}x\log(f)+dx\log(f)\right)\log\left(f^{dx+c}+1\right)}{d^3f^{dx+c}\log(f)^3+d^3\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(2+f^(-d*x-c)+f^(d*x+c)),x, algorithm="fricas")
```

```
[Out] -(c^2*log(f)^2 - (d^2*x^2 - c^2)*f^(d*x + c)*log(f)^2 + 2*(f^(d*x + c) + 1)
*dilog(-f^(d*x + c)) + 2*(d*f^(d*x + c)*x*log(f) + d*x*log(f))*log(f^(d*x +
 c) + 1))/(d^3*f^(d*x + c)*log(f)^3 + d^3*log(f)^3)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\frac{x^2}{df^{c+dx}\log(f)+d\log(f)}+\frac{2\int\frac{x}{e^{c\log(f)}e^{dx\log(f)}+1}\,dx}{d\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(2+f**(-d*x-c)+f**(d*x+c)),x)
```

```
[Out] -x**2/(d*f**(c + d*x)*log(f) + d*log(f)) + 2*Integral(x/(exp(c*log(f))*exp(
d*x*log(f)) + 1), x)/(d*log(f))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(2+f^(-d*x-c)+f^(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(x^2/(f^(d*x + c) + f^(-d*x - c) + 2), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{x^2}{\frac{1}{f^{c+d\,x}}+f^{c+d\,x}+2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(1/f^(c + d*x) + f^(c + d*x) + 2),x)
```

```
[Out] int(x^2/(1/f^(c + d*x) + f^(c + d*x) + 2), x)
```

3.535 $\int \frac{1}{2+3^{-x}+3^x} \, dx$

Optimal. Leaf size=13

$$-\frac{1}{(1+3^x)\log(3)}$$

```
[Out] -1/(1+3^x)/ln(3)
```

Rubi [A]
time = 0.01, antiderivative size = 13, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {2320, 32}

$$-\frac{1}{(3^x+1)\log(3)}$$

Antiderivative was successfully verified.

```
[In] Int[(2 + 3^(-x) + 3^x)^(-1),x]
```

```
[Out] -(1/((1 + 3^x)*Log[3]))
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{2+3^{-x}+3^x} \, dx &= \frac{\text{Subst}\left(\int \frac{1}{(1+x)^2} \, dx, x, 3^x\right)}{\log(3)}\\ &= -\frac{1}{(1+3^x)\log(3)}\end{aligned}$$

Mathematica [A]
time = 0.03, size = 13, normalized size = 1.00

$$-\frac{1}{(1+3^x)\log(3)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(2 + 3^(-x) + 3^x)^(-1),x]
[Out] -(1/((1 + 3^x)*Log[3]))
```

Maple [A]
time = 0.02, size = 14, normalized size = 1.08

method	result	size
derivativedivides	$-\frac{1}{(1+3^{x}) \ln(3)}$	14
default	$-\frac{1}{(1+3^{x}) \ln(3)}$	14
risch	$-\frac{1}{(1+3^{x}) \ln(3)}$	14
norman	$\frac{e^{x \ln(3)}}{\ln(3)(e^{x \ln(3)}+1)}$	20

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(2+1/(3^x)+3^x),x,method=_RETURNVERBOSE)
[Out] -1/(1+3^x)/ln(3)
```

Maxima [A]
time = 0.28, size = 14, normalized size = 1.08

$$\frac{1}{\left(\frac{1}{3^{x}}+1\right)\log\left(3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+1/(3^x)+3^x),x, algorithm="maxima")
[Out] 1/((1/3^x + 1)*log(3))
```

Fricas [A]
time = 0.38, size = 13, normalized size = 1.00

$$-\frac{1}{3^{x}\log\left(3\right)+\log\left(3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+1/(3^x)+3^x),x, algorithm="fricas")
[Out] -1/(3^x*log(3) + log(3))
```

Sympy [A]
time = 0.03, size = 12, normalized size = 0.92

$$-\frac{1}{3^{x}\log\left(3\right)+\log\left(3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+1/(3**x)+3**x),x)
```

```
[Out] -1/(3**x*log(3) + log(3))
```

Giac [A]
time = 2.83, size = 13, normalized size = 1.00

$$-\frac{1}{(3^x+1)\log(3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+1/(3^x)+3^x),x, algorithm="giac")
```

```
[Out] -1/((3^x + 1)*log(3))
```

Mupad [B]
time = 3.48, size = 13, normalized size = 1.00

$$-\frac{1}{\ln(3)\ (3^x+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(1/3^x + 3^x + 2),x)
```

```
[Out] -1/(log(3)*(3^x + 1))
```

3.536 $\int \frac{1}{1-e^{-x}+2e^{x}}\,dx$

Optimal. Leaf size=23

$$\frac{1}{3}\log\left(1-2e^{x}\right)-\frac{1}{3}\log\left(1+e^{x}\right)$$

[Out] 1/3*ln(1-2*exp(x))-1/3*ln(1+exp(x))

Rubi [A]
time = 0.01, antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.188$, Rules used = {2320, 630, 31}

$$\frac{1}{3}\log\left(1-2e^{x}\right)-\frac{1}{3}\log\left(e^{x}+1\right)$$

Antiderivative was successfully verified.

[In] Int[(1 - E^(-x) + 2*E^x)^(-1),x]

[Out] Log[1 - 2*E^x]/3 - Log[1 + E^x]/3

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 630

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = Rt[b^2
 - 4*a*c, 2]}, Dist[c/q, Int[1/Simp[b/2 - q/2 + c*x, x], x], x] - Dist[c/q,
 Int[1/Simp[b/2 + q/2 + c*x, x], x], x]] /; FreeQ[{a, b, c}, x] && NeQ[b^2
- 4*a*c, 0] && PosQ[b^2 - 4*a*c] && PerfectSquareQ[b^2 - 4*a*c]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{1}{1-e^{-x}+2e^x}\,dx = \text{Subst}\left(\int \frac{1}{-1+x+2x^2}\,dx, x, e^x\right)$$
$$= \frac{2}{3}\text{Subst}\left(\int \frac{1}{-1+2x}\,dx, x, e^x\right) - \frac{2}{3}\text{Subst}\left(\int \frac{1}{2+2x}\,dx, x, e^x\right)$$
$$= \frac{1}{3}\log\left(1-2e^x\right) - \frac{1}{3}\log\left(1+e^x\right)$$

Mathematica [A]
time = 0.03, size = 18, normalized size = 0.78

$$\frac{2}{3}\tanh^{-1}\left(\frac{1}{3}-\frac{2e^{-x}}{3}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 - E^(-x) + 2*E^x)^(-1),x]
[Out] (2*ArcTanh[1/3 - 2/(3*E^x)])/3
```

Maple [A]
time = 0.01, size = 18, normalized size = 0.78

method	result	size
risch	$\frac{\ln\left(-\frac{1}{2}+e^x\right)}{3}-\frac{\ln\left(1+e^x\right)}{3}$	16
derivativedivides	$-\frac{\ln\left(1+e^x\right)}{3}+\frac{\ln\left(2\,e^x-1\right)}{3}$	18
default	$-\frac{\ln\left(1+e^x\right)}{3}+\frac{\ln\left(2\,e^x-1\right)}{3}$	18
norman	$-\frac{\ln\left(1+e^x\right)}{3}+\frac{\ln\left(2\,e^x-1\right)}{3}$	18

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(1-1/exp(x)+2*exp(x)),x,method=_RETURNVERBOSE)
[Out] -1/3*ln(1+exp(x))+1/3*ln(2*exp(x)-1)
```

Maxima [A]
time = 0.28, size = 19, normalized size = 0.83

$$-\frac{1}{3}\log\left(e^{(-x)}+1\right)+\frac{1}{3}\log\left(e^{(-x)}-2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1-1/exp(x)+2*exp(x)),x, algorithm="maxima")
```

```
[Out] -1/3*log(e^(-x) + 1) + 1/3*log(e^(-x) - 2)
```

Fricas [A]
time = 0.41, size = 17, normalized size = 0.74

$$\frac{1}{3}\,\log\left(2\,e^{x}-1\right)-\frac{1}{3}\,\log\left(e^{x}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1-1/exp(x)+2*exp(x)),x, algorithm="fricas")
[Out] 1/3*log(2*e^x - 1) - 1/3*log(e^x + 1)
```

Sympy [A]
time = 0.05, size = 17, normalized size = 0.74

$$\frac{\log\left(e^{x}-\frac{1}{2}\right)}{3}-\frac{\log\left(e^{x}+1\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1-1/exp(x)+2*exp(x)),x)
[Out] log(exp(x) - 1/2)/3 - log(exp(x) + 1)/3
```

Giac [A]
time = 3.94, size = 18, normalized size = 0.78

$$-\frac{1}{3}\,\log\left(e^{x}+1\right)+\frac{1}{3}\,\log\left(|2\,e^{x}-1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1-1/exp(x)+2*exp(x)),x, algorithm="giac")
[Out] -1/3*log(e^x + 1) + 1/3*log(abs(2*e^x - 1))
```

Mupad [B]
time = 0.12, size = 17, normalized size = 0.74

$$\frac{\ln\left(2\,\mathrm{e}^{x}-1\right)}{3}-\frac{\ln\left(\mathrm{e}^{x}+1\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(2*exp(x) - exp(-x) + 1),x)
[Out] log(2*exp(x) - 1)/3 - log(exp(x) + 1)/3
```

3.537 $\int \frac{1}{a+be^{-x}+ce^{x}}\,dx$

Optimal. Leaf size=36

$$-\frac{2\tanh^{-1}\left(\frac{a+2ce^x}{\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}$$

```
[Out] -2*arctanh((a+2*c*exp(x))/(a^2-4*b*c)^(1/2))/(a^2-4*b*c)^(1/2)
```

Rubi [A]
time = 0.04, antiderivative size = 36, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.250$, Rules used = {2320, 1400, 632, 212}

$$-\frac{2\tanh^{-1}\left(\frac{a+2ce^x}{\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/E^x + c*E^x)^(-1),x]
```

```
[Out] (-2*ArcTanh[(a + 2*c*E^x)/Sqrt[a^2 - 4*b*c]])/Sqrt[a^2 - 4*b*c]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 632

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 1400

```
Int[(x_)^(m_.)*((a_) + (c_.)*(x_)^(n_.) + (b_.)*(x_)^(mn_))^(p_.), x_Symbol
] :> Int[x^(m - n*p)*(b + a*x^n + c*x^(2*n))^p, x] /; FreeQ[{a, b, c, m, n}
, x] && EqQ[mn, -n] && IntegerQ[p] && PosQ[n]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
```

```
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$
\begin{aligned}
\int \frac{1}{a+be^{-x}+ce^x}\,dx &= \text{Subst}\left(\int \frac{1}{x\left(a+\frac{b}{x}+cx\right)}\,dx,x,e^x\right)\\
&= \text{Subst}\left(\int \frac{1}{b+ax+cx^2}\,dx,x,e^x\right)\\
&= -\left(2\text{Subst}\left(\int \frac{1}{a^2-4bc-x^2}\,dx,x,a+2ce^x\right)\right)\\
&= -\frac{2\tanh^{-1}\left(\frac{a+2ce^x}{\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}
\end{aligned}
$$

Mathematica [A]
time = 0.04, size = 40, normalized size = 1.11

$$\frac{2\tan^{-1}\left(\frac{a+2ce^x}{\sqrt{-a^2+4bc}}\right)}{\sqrt{-a^2+4bc}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/E^x + c*E^x)^(-1),x]
[Out] (2*ArcTan[(a + 2*c*E^x)/Sqrt[-a^2 + 4*b*c]])/Sqrt[-a^2 + 4*b*c]
```

Maple [A]
time = 0.02, size = 36, normalized size = 1.00

method	result	size
derivativedivides	$\frac{2\arctan\left(\frac{a+2c\,e^x}{\sqrt{-a^2+4cb}}\right)}{\sqrt{-a^2+4cb}}$	36
default	$\frac{2\arctan\left(\frac{a+2c\,e^x}{\sqrt{-a^2+4cb}}\right)}{\sqrt{-a^2+4cb}}$	36
risch	$\frac{\ln\left(e^x+\frac{a\sqrt{a^2-4cb}-a^2+4cb}{2c\sqrt{a^2-4cb}}\right)}{\sqrt{a^2-4cb}}-\frac{\ln\left(e^x+\frac{a\sqrt{a^2-4cb}+a^2-4cb}{2c\sqrt{a^2-4cb}}\right)}{\sqrt{a^2-4cb}}$	105

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b/exp(x)+c*exp(x)),x,method=_RETURNVERBOSE)
```

```
[Out] 2/(-a^2+4*b*c)^(1/2)*arctan((a+2*c*exp(x))/(-a^2+4*b*c)^(1/2))
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b/exp(x)+c*exp(x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b*c-a^2>0)', see `assume?` for mo
re deta
```

Fricas [A]
time = 0.40, size = 126, normalized size = 3.50

$$\left[\frac{\log\left(\frac{2\,c^2e^{(2\,x)}+2\,ace^x+a^2-2\,bc-\sqrt{a^2-4\,bc}\,(2\,ce^x+a)}{ce^{(2\,x)}+ae^x+b}\right)}{\sqrt{a^2-4\,bc}}, -\frac{2\,\sqrt{-a^2+4\,bc}\,\arctan\left(-\frac{\sqrt{-a^2+4\,bc}\,(2\,ce^x+a)}{a^2-4\,bc}\right)}{a^2-4\,bc}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b/exp(x)+c*exp(x)),x, algorithm="fricas")
```

```
[Out] [log((2*c^2*e^(2*x) + 2*a*c*e^x + a^2 - 2*b*c - sqrt(a^2 - 4*b*c)*(2*c*e^x
+ a))/(c*e^(2*x) + a*e^x + b))/sqrt(a^2 - 4*b*c), -2*sqrt(-a^2 + 4*b*c)*arc
tan(-sqrt(-a^2 + 4*b*c)*(2*c*e^x + a)/(a^2 - 4*b*c))/(a^2 - 4*b*c)]
```

Sympy [A]
time = 0.12, size = 36, normalized size = 1.00

$$\operatorname{RootSum}\left(z^2\left(a^2-4bc\right)-1,\left(i\mapsto i\log\left(e^x+\frac{-ia^2+4ibc+a}{2c}\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b/exp(x)+c*exp(x)),x)
```

```
[Out] RootSum(_z**2*(a**2 - 4*b*c) - 1, Lambda(_i, _i*log(exp(x) + (-_i*a**2 + 4*
_i*b*c + a)/(2*c))))
```

Giac [A]
time = 4.49, size = 35, normalized size = 0.97

$$\frac{2\arctan\left(\frac{2\,ce^{x}+a}{\sqrt{-a^{2}+4\,bc}}\right)}{\sqrt{-a^{2}+4\,bc}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b/exp(x)+c*exp(x)),x, algorithm="giac")
[Out] 2*arctan((2*c*e^x + a)/sqrt(-a^2 + 4*b*c))/sqrt(-a^2 + 4*b*c)
```

Mupad [B]
time = 0.21, size = 35, normalized size = 0.97

$$\frac{2\,\mathrm{atan}\left(\frac{a+2\,c\,\mathrm{e}^{x}}{\sqrt{4\,b\,c-a^{2}}}\right)}{\sqrt{4\,b\,c-a^{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a + c*exp(x) + b*exp(-x)),x)
[Out] (2*atan((a + 2*c*exp(x))/(4*b*c - a^2)^(1/2)))/(4*b*c - a^2)^(1/2)
```

3.538 $\int \frac{x}{a+be^{-x}+ce^x}\,dx$

Optimal. Leaf size=159

$$\frac{x\log\left(1+\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}-\frac{x\log\left(1+\frac{2ce^x}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}+\frac{\text{Li}_2\left(-\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}-\frac{\text{Li}_2\left(-\frac{2ce^x}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}$$

```
[Out] x*ln(1+2*c*exp(x)/(a-(a^2-4*b*c)^(1/2)))/(a^2-4*b*c)^(1/2)-x*ln(1+2*c*exp(x
)/(a+(a^2-4*b*c)^(1/2)))/(a^2-4*b*c)^(1/2)+polylog(2,-2*c*exp(x)/(a-(a^2-4*
b*c)^(1/2)))/(a^2-4*b*c)^(1/2)-polylog(2,-2*c*exp(x)/(a+(a^2-4*b*c)^(1/2)))
/(a^2-4*b*c)^(1/2)
```

Rubi [A]
time = 0.21, antiderivative size = 159, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.278$, Rules used = {2299, 2296, 2221, 2317, 2438}

$$\frac{\text{PolyLog}\left(2,-\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}-\frac{\text{PolyLog}\left(2,-\frac{2ce^x}{\sqrt{a^2-4bc}+a}\right)}{\sqrt{a^2-4bc}}+\frac{x\log\left(\frac{2ce^x}{a-\sqrt{a^2-4bc}}+1\right)}{\sqrt{a^2-4bc}}-\frac{x\log\left(\frac{2ce^x}{\sqrt{a^2-4bc}+a}+1\right)}{\sqrt{a^2-4bc}}$$

Antiderivative was successfully verified.

```
[In] Int[x/(a + b/E^x + c*E^x),x]
```

```
[Out] (x*Log[1 + (2*c*E^x)/(a - Sqrt[a^2 - 4*b*c])])/Sqrt[a^2 - 4*b*c] - (x*Log[1
 + (2*c*E^x)/(a + Sqrt[a^2 - 4*b*c])])/Sqrt[a^2 - 4*b*c] + PolyLog[2, (-2*c
*E^x)/(a - Sqrt[a^2 - 4*b*c])]/Sqrt[a^2 - 4*b*c] - PolyLog[2, (-2*c*E^x)/(a
 + Sqrt[a^2 - 4*b*c])]/Sqrt[a^2 - 4*b*c]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2299

```
Int[(u_)/((a_) + (b_.)*(F_)^(v_) + (c_.)*(F_)^(w_)), x_Symbol] :> Int[u*(F^
v/(c + a*F^v + b*F^(2*v))), x] /; FreeQ[{F, a, b, c}, x] && EqQ[w, -v] && L
inearQ[v, x] && If[RationalQ[Coefficient[v, x, 1]], GtQ[Coefficient[v, x, 1
], 0], LtQ[LeafCount[v], LeafCount[w]]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{x}{a+be^{-x}+ce^{x}}\,dx &= \int \frac{e^{x}x}{b+ae^{x}+ce^{2x}}\,dx\\
&= \frac{(2c)\int \frac{e^{x}x}{a-\sqrt{a^2-4bc}+2ce^{x}}\,dx}{\sqrt{a^2-4bc}} - \frac{(2c)\int \frac{e^{x}x}{a+\sqrt{a^2-4bc}+2ce^{x}}\,dx}{\sqrt{a^2-4bc}}\\
&= \frac{x\log\left(1+\frac{2ce^{x}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} - \frac{x\log\left(1+\frac{2ce^{x}}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} - \frac{\int \log\left(1+\frac{2ce^{x}}{a-\sqrt{a^2-4b}}\right.}{\sqrt{a^2-4bc}}\\
&= \frac{x\log\left(1+\frac{2ce^{x}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} - \frac{x\log\left(1+\frac{2ce^{x}}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} - \frac{\text{Subst}\left(\int \frac{\log\left(1+\frac{2c}{a-\sqrt{a^2}}\right.}{x}\right.}{\sqrt{a^2-}}\\
&= \frac{x\log\left(1+\frac{2ce^{x}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} - \frac{x\log\left(1+\frac{2ce^{x}}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} + \frac{\text{Li}_2\left(-\frac{2ce^{x}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}\end{aligned}$$

Mathematica [A]
time = 0.08, size = 123, normalized size = 0.77

$$\frac{x\left(\log\left(1+\frac{2ce^{x}}{a-\sqrt{a^2-4bc}}\right)-\log\left(1+\frac{2ce^{x}}{a+\sqrt{a^2-4bc}}\right)\right)+\text{Li}_2\left(\frac{2ce^{x}}{-a+\sqrt{a^2-4bc}}\right)-\text{Li}_2\left(-\frac{2ce^{x}}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(a + b/E^x + c*E^x),x]
```

```
[Out] (x*(Log[1 + (2*c*E^x)/(a - Sqrt[a^2 - 4*b*c])] - Log[1 + (2*c*E^x)/(a + Sqr
t[a^2 - 4*b*c])]) + PolyLog[2, (2*c*E^x)/(-a + Sqrt[a^2 - 4*b*c])] - PolyLo
g[2, (-2*c*E^x)/(a + Sqrt[a^2 - 4*b*c])])/Sqrt[a^2 - 4*b*c]
```

Maple [A]
time = 0.02, size = 171, normalized size = 1.08

method	result
default	$\frac{x\left(\ln\left(\frac{-2c\,e^{x}+\sqrt{a^{2}-4cb}-a}{-a+\sqrt{a^{2}-4cb}}\right)-\ln\left(\frac{2c\,e^{x}+\sqrt{a^{2}-4cb}+a}{a+\sqrt{a^{2}-4cb}}\right)\right)}{\sqrt{a^{2}-4cb}}+\frac{\operatorname{dilog}\left(\frac{-2c\,e^{x}+\sqrt{a^{2}-4cb}-a}{-a+\sqrt{a^{2}-4cb}}\right)-\operatorname{dilog}\left(\frac{2c\,e^{x}+\sqrt{a^{2}-}}{a+\sqrt{a^{2}-}}\right.}{\sqrt{a^{2}-4cb}}$
risch	$\frac{x\left(\ln\left(\frac{-2c\,e^{x}+\sqrt{a^{2}-4cb}-a}{-a+\sqrt{a^{2}-4cb}}\right)-\ln\left(\frac{2c\,e^{x}+\sqrt{a^{2}-4cb}+a}{a+\sqrt{a^{2}-4cb}}\right)\right)}{\sqrt{a^{2}-4cb}}+\frac{\operatorname{dilog}\left(\frac{-2c\,e^{x}+\sqrt{a^{2}-4cb}-a}{-a+\sqrt{a^{2}-4cb}}\right)}{\sqrt{a^{2}-4cb}}-\frac{\operatorname{dilog}\left(\frac{2c\,e^{x}+\sqrt{a^{2}}}{a+\sqrt{a^{2}}}\right.}{\sqrt{a^{2}-}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a+b/exp(x)+c*exp(x)),x,method=_RETURNVERBOSE)
```

```
[Out] x*(ln((-2*c*exp(x)+(a^2-4*b*c)^(1/2)-a)/(-a+(a^2-4*b*c)^(1/2)))-ln((2*c*exp
(x)+(a^2-4*b*c)^(1/2)+a)/(a+(a^2-4*b*c)^(1/2))))/(a^2-4*b*c)^(1/2)+(dilog((
-2*c*exp(x)+(a^2-4*b*c)^(1/2)-a)/(-a+(a^2-4*b*c)^(1/2)))-dilog((2*c*exp(x)+
(a^2-4*b*c)^(1/2)+a)/(a+(a^2-4*b*c)^(1/2))))/(a^2-4*b*c)^(1/2)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b/exp(x)+c*exp(x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(a^2-4*b*c>0)', see `assume?` for mo
re deta
```

Fricas [A]
time = 0.36, size = 214, normalized size = 1.35

$$\frac{bx\sqrt{\frac{a^{2}-4\,bc}{b^{2}}}\log\left(\frac{b\sqrt{\frac{a^{2}-4\,bc}{b^{2}}}\,e^{x}+ae^{x}+2\,b}{2\,b}\right)-bx\sqrt{\frac{a^{2}-4\,bc}{b^{2}}}\log\left(-\frac{b\sqrt{\frac{a^{2}-4\,bc}{b^{2}}}\,e^{x}-ae^{x}-2\,b}{2\,b}\right)+b\sqrt{\frac{a^{2}-4\,bc}{b^{2}}}\,\mathrm{Li}_2\left(-\frac{b\sqrt{\frac{a^{2}-4\,bc}{b^{2}}}\,e^{x}+ae^{x}+2\,b}{2\,b}+1\right)-b\sqrt{\frac{a^{2}-4\,bc}{b^{2}}}\,\mathrm{Li}_2\left(\frac{b\sqrt{\frac{a^{2}-4\,bc}{b^{2}}}\,e^{x}-ae^{x}-2\,b}{2\,b}+1\right)}{a^{2}-4\,bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b/exp(x)+c*exp(x)),x, algorithm="fricas")
```

```
[Out] (b*x*sqrt((a^2 - 4*b*c)/b^2)*log(1/2*(b*sqrt((a^2 - 4*b*c)/b^2)*e^x + a*e^x
 + 2*b)/b) - b*x*sqrt((a^2 - 4*b*c)/b^2)*log(-1/2*(b*sqrt((a^2 - 4*b*c)/b^2
)*e^x - a*e^x - 2*b)/b) + b*sqrt((a^2 - 4*b*c)/b^2)*dilog(-1/2*(b*sqrt((a^2
 - 4*b*c)/b^2)*e^x + a*e^x + 2*b)/b + 1) - b*sqrt((a^2 - 4*b*c)/b^2)*dilog(
1/2*(b*sqrt((a^2 - 4*b*c)/b^2)*e^x - a*e^x - 2*b)/b + 1))/(a^2 - 4*b*c)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{xe^x}{ae^x + b + ce^{2x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b/exp(x)+c*exp(x)),x)
```

```
[Out] Integral(x*exp(x)/(a*exp(x) + b + c*exp(2*x)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b/exp(x)+c*exp(x)),x, algorithm="giac")
```

```
[Out] integrate(x/(b*e^(-x) + c*e^x + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x}{a + c\,\mathrm{e}^x + b\,\mathrm{e}^{-x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a + c*exp(x) + b*exp(-x)),x)
```

```
[Out] int(x/(a + c*exp(x) + b*exp(-x)), x)
```

3.539 $\int \frac{x^2}{a+be^{-x}+ce^x}\,dx$

Optimal. Leaf size=244

$$\frac{x^2\log\left(1+\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}-\frac{x^2\log\left(1+\frac{2ce^x}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}+\frac{2x\text{Li}_2\left(-\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}-\frac{2x\text{Li}_2\left(-\frac{2ce^x}{a+\sqrt{a^2-4b}}\right.}{\sqrt{a^2-4bc}}$$

```
[Out] x^2*ln(1+2*c*exp(x)/(a-(a^2-4*b*c)^(1/2)))/(a^2-4*b*c)^(1/2)-x^2*ln(1+2*c*e
xp(x)/(a+(a^2-4*b*c)^(1/2)))/(a^2-4*b*c)^(1/2)+2*x*polylog(2,-2*c*exp(x)/(a
-(a^2-4*b*c)^(1/2)))/(a^2-4*b*c)^(1/2)-2*x*polylog(2,-2*c*exp(x)/(a+(a^2-4*
b*c)^(1/2)))/(a^2-4*b*c)^(1/2)-2*polylog(3,-2*c*exp(x)/(a-(a^2-4*b*c)^(1/2)
))/(a^2-4*b*c)^(1/2)+2*polylog(3,-2*c*exp(x)/(a+(a^2-4*b*c)^(1/2)))/(a^2-4*
b*c)^(1/2)
```

Rubi [A]
time = 0.34, antiderivative size = 244, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.300$, Rules used = {2299, 2296, 2221, 2611, 2320, 6724}

$$\frac{2x\text{PolyLog}\left(2,-\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}-\frac{2x\text{PolyLog}\left(2,-\frac{2ce^x}{\sqrt{a^2-4bc}+a}\right)}{\sqrt{a^2-4bc}}-\frac{2\text{PolyLog}\left(3,-\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}+\frac{2\text{PolyLog}\left(3,-\frac{2ce^x}{\sqrt{a^2-4bc}+a}\right)}{\sqrt{a^2-4bc}}+\frac{x^2\log\left(\frac{2ce^x}{a-\sqrt{a^2-4bc}}+1\right)}{\sqrt{a^2-4bc}}-\frac{x^2\log\left(\frac{2ce^x}{\sqrt{a^2-4bc}+a}+1\right)}{\sqrt{a^2-4bc}}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(a + b/E^x + c*E^x),x]
```

```
[Out] (x^2*Log[1 + (2*c*E^x)/(a - Sqrt[a^2 - 4*b*c])])/Sqrt[a^2 - 4*b*c] - (x^2*L
og[1 + (2*c*E^x)/(a + Sqrt[a^2 - 4*b*c])])/Sqrt[a^2 - 4*b*c] + (2*x*PolyLog
[2, (-2*c*E^x)/(a - Sqrt[a^2 - 4*b*c])])/Sqrt[a^2 - 4*b*c] - (2*x*PolyLog[2
, (-2*c*E^x)/(a + Sqrt[a^2 - 4*b*c])])/Sqrt[a^2 - 4*b*c] - (2*PolyLog[3, (-
2*c*E^x)/(a - Sqrt[a^2 - 4*b*c])])/Sqrt[a^2 - 4*b*c] + (2*PolyLog[3, (-2*c*
E^x)/(a + Sqrt[a^2 - 4*b*c])])/Sqrt[a^2 - 4*b*c]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
```

```
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2299

```
Int[(u_)/((a_) + (b_.)*(F_)^(v_) + (c_.)*(F_)^(w_)), x_Symbol] :> Int[u*(F^
v/(c + a*F^v + b*F^(2*v))), x] /; FreeQ[{F, a, b, c}, x] && EqQ[w, -v] && L
inearQ[v, x] && If[RationalQ[Coefficient[v, x, 1]], GtQ[Coefficient[v, x, 1
], 0], LtQ[LeafCount[v], LeafCount[w]]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^2}{a+be^{-x}+ce^x}\,dx = \int \frac{e^x x^2}{b+ae^x+ce^{2x}}\,dx$$

$$= \frac{(2c)\int \frac{e^x x^2}{a-\sqrt{a^2-4bc}+2ce^x}\,dx}{\sqrt{a^2-4bc}} - \frac{(2c)\int \frac{e^x x^2}{a+\sqrt{a^2-4bc}+2ce^x}\,dx}{\sqrt{a^2-4bc}}$$

$$= \frac{x^2\log\left(1+\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} - \frac{x^2\log\left(1+\frac{2ce^x}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} - \frac{2\int x\log\left(1+\frac{2ce}{a-\sqrt{a^2}}\right.}{\sqrt{a^2-4bc}}$$

$$= \frac{x^2\log\left(1+\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} - \frac{x^2\log\left(1+\frac{2ce^x}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} + \frac{2x\text{Li}_2\left(-\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right.}{\sqrt{a^2-4bc}}$$

$$= \frac{x^2\log\left(1+\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} - \frac{x^2\log\left(1+\frac{2ce^x}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} + \frac{2x\text{Li}_2\left(-\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right.}{\sqrt{a^2-4bc}}$$

$$= \frac{x^2\log\left(1+\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} - \frac{x^2\log\left(1+\frac{2ce^x}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} + \frac{2x\text{Li}_2\left(-\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right.}{\sqrt{a^2-4bc}}$$

Mathematica [A]
time = 0.06, size = 185, normalized size = 0.76

$$\frac{x^2\log\left(1+\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right) - x^2\log\left(1+\frac{2ce^x}{a+\sqrt{a^2-4bc}}\right) + 2x\text{Li}_2\left(\frac{2ce^x}{-a+\sqrt{a^2-4bc}}\right) - 2x\text{Li}_2\left(-\frac{2ce^x}{a+\sqrt{a^2-4bc}}\right) - 2\text{Li}_3\left(\frac{2ce^x}{-a+\sqrt{a^2-4bc}}\right) + 2\text{Li}_3\left(-\frac{2ce^x}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(a + b/E^x + c*E^x),x]
```

```
[Out] (x^2*Log[1 + (2*c*E^x)/(a - Sqrt[a^2 - 4*b*c])] - x^2*Log[1 + (2*c*E^x)/(a
+ Sqrt[a^2 - 4*b*c])] + 2*x*PolyLog[2, (2*c*E^x)/(-a + Sqrt[a^2 - 4*b*c])]
- 2*x*PolyLog[2, (-2*c*E^x)/(a + Sqrt[a^2 - 4*b*c])] - 2*PolyLog[3, (2*c*E^
x)/(-a + Sqrt[a^2 - 4*b*c])] + 2*PolyLog[3, (-2*c*E^x)/(a + Sqrt[a^2 - 4*b*
c])])/Sqrt[a^2 - 4*b*c]
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{x^2}{a+b\,\mathrm{e}^{-x}+c\,\mathrm{e}^x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a+b/exp(x)+c*exp(x)),x)
```

```
[Out] int(x^2/(a+b/exp(x)+c*exp(x)),x)
```

Maxima [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b/exp(x)+c*exp(x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(a^2-4*b*c>0)', see `assume?` for mo
re deta
```

Fricas [**A**]
time = 0.38, size = 316, normalized size = 1.30

$$\frac{bx^2\sqrt{\frac{a^2-4\,bc}{b^2}}\log\left(\frac{b\sqrt{\frac{a^2-4\,bc}{b^2}}\,e^x+ae^x+2\,b}{2\,b}\right)-bx^2\sqrt{\frac{a^2-4\,bc}{b^2}}\log\left(-\frac{b\sqrt{\frac{a^2-4\,bc}{b^2}}\,e^x-ae^x-2\,b}{2\,b}\right)+2\,bx\sqrt{\frac{a^2-4\,bc}{b^2}}\,\mathrm{Li}_2\left(-\frac{b\sqrt{\frac{a^2-4\,bc}{b^2}}\,e^x+ae^x+2\,b}{2\,b}+1\right)-2\,bx\sqrt{\frac{a^2-4\,bc}{b^2}}\,\mathrm{Li}_2\left(\frac{b\sqrt{\frac{a^2-4\,bc}{b^2}}\,e^x-ae^x-2\,b}{2\,b}+1\right)-2\,b\sqrt{\frac{a^2-4\,bc}{b^2}}\,\mathrm{polylog}\left(3,-\frac{b\sqrt{\frac{a^2-4\,bc}{b^2}}\,e^x+ae^x}{2\,b}\right)+2\,b\sqrt{\frac{a^2-4\,bc}{b^2}}\,\mathrm{polylog}\left(3,\frac{b\sqrt{\frac{a^2-4\,bc}{b^2}}\,e^x-ae^x}{2\,b}\right)}{a^2-4\,bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b/exp(x)+c*exp(x)),x, algorithm="fricas")
```

```
[Out] (b*x^2*sqrt((a^2 - 4*b*c)/b^2)*log(1/2*(b*sqrt((a^2 - 4*b*c)/b^2)*e^x + a*e
^x + 2*b)/b) - b*x^2*sqrt((a^2 - 4*b*c)/b^2)*log(-1/2*(b*sqrt((a^2 - 4*b*c)
/b^2)*e^x - a*e^x - 2*b)/b) + 2*b*x*sqrt((a^2 - 4*b*c)/b^2)*dilog(-1/2*(b*s
qrt((a^2 - 4*b*c)/b^2)*e^x + a*e^x + 2*b)/b + 1) - 2*b*x*sqrt((a^2 - 4*b*c)
/b^2)*dilog(1/2*(b*sqrt((a^2 - 4*b*c)/b^2)*e^x - a*e^x - 2*b)/b + 1) - 2*b*
sqrt((a^2 - 4*b*c)/b^2)*polylog(3, -1/2*(b*sqrt((a^2 - 4*b*c)/b^2)*e^x + a*
e^x)/b) + 2*b*sqrt((a^2 - 4*b*c)/b^2)*polylog(3, 1/2*(b*sqrt((a^2 - 4*b*c)/
b^2)*e^x - a*e^x)/b))/(a^2 - 4*b*c)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2e^x}{ae^x+b+ce^{2x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a+b/exp(x)+c*exp(x)),x)
```

```
[Out] Integral(x**2*exp(x)/(a*exp(x) + b + c*exp(2*x)), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b/exp(x)+c*exp(x)),x, algorithm="giac")
```

```
[Out] integrate(x^2/(b*e^(-x) + c*e^x + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2}{a+c\,\mathrm{e}^x+b\,\mathrm{e}^{-x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a + c*exp(x) + b*exp(-x)),x)
```

```
[Out] int(x^2/(a + c*exp(x) + b*exp(-x)), x)
```

3.540 $\int \frac{1}{a+bf^{-c-dx}+cf^{c+dx}}\,dx$

Optimal. Leaf size=47

$$-\frac{2\tanh^{-1}\left(\frac{a+2cf^{c+dx}}{\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)}$$

```
[Out] -2*arctanh((a+2*c*f^(d*x+c))/(a^2-4*b*c)^(1/2))/d/ln(f)/(a^2-4*b*c)^(1/2)
```

Rubi [A]
time = 0.05, antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {2320, 1400, 632, 212}

$$-\frac{2\tanh^{-1}\left(\frac{a+2cf^{c+dx}}{\sqrt{a^2-4bc}}\right)}{d\log(f)\sqrt{a^2-4bc}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*f^(-c - d*x) + c*f^(c + d*x))^(-1),x]
```

```
[Out] (-2*ArcTanh[(a + 2*c*f^(c + d*x))/Sqrt[a^2 - 4*b*c]])/(Sqrt[a^2 - 4*b*c]*d*
Log[f])
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 632

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 1400

```
Int[(x_)^(m_.)*((a_) + (c_.)*(x_)^(n_.) + (b_.)*(x_)^(mn_))^(p_.), x_Symbol
] :> Int[x^(m - n*p)*(b + a*x^n + c*x^(2*n))^p, x] /; FreeQ[{a, b, c, m, n}
, x] && EqQ[mn, -n] && IntegerQ[p] && PosQ[n]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
```

```
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{1}{a+bf^{-c-dx}+cf^{c+dx}}\,dx = \frac{\operatorname{Subst}\left(\int \frac{1}{x\left(a+\frac{b}{x}+cx\right)}\,dx, x, f^{c+dx}\right)}{d\log(f)}$$
$$= \frac{\operatorname{Subst}\left(\int \frac{1}{b+ax+cx^2}\,dx, x, f^{c+dx}\right)}{d\log(f)}$$
$$= -\frac{2\operatorname{Subst}\left(\int \frac{1}{a^2-4bc-x^2}\,dx, x, a+2cf^{c+dx}\right)}{d\log(f)}$$
$$= -\frac{2\tanh^{-1}\left(\frac{a+2cf^{c+dx}}{\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)}$$

Mathematica [A]
time = 0.11, size = 51, normalized size = 1.09

$$\frac{2\tan^{-1}\left(\frac{a+2cf^{c+dx}}{\sqrt{-a^2+4bc}}\right)}{\sqrt{-a^2+4bc}\,d\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*f^(-c - d*x) + c*f^(c + d*x))^(-1),x]
[Out] (2*ArcTan[(a + 2*c*f^(c + d*x))/Sqrt[-a^2 + 4*b*c]])/(Sqrt[-a^2 + 4*b*c]*d*
Log[f])
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 134 vs. 2(43) = 86.
time = 0.04, size = 135, normalized size = 2.87

method	result	size
risch	$\frac{\ln\left(f^{-dx-c}+\frac{a\sqrt{a^2-4cb}+a^2-4cb}{2b\sqrt{a^2-4cb}}\right)}{\sqrt{a^2-4cb}\,d\ln(f)}-\frac{\ln\left(f^{-dx-c}+\frac{a\sqrt{a^2-4cb}-a^2+4cb}{2b\sqrt{a^2-4cb}}\right)}{\sqrt{a^2-4cb}\,d\ln(f)}$	135

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/(a^2-4*b*c)^(1/2)/d/ln(f)*ln(f^(-d*x-c)+1/2*(a*(a^2-4*b*c)^(1/2)+a^2-4*c*
b)/b/(a^2-4*b*c)^(1/2))-1/(a^2-4*b*c)^(1/2)/d/ln(f)*ln(f^(-d*x-c)+1/2*(a*(a
^2-4*b*c)^(1/2)-a^2+4*c*b)/b/(a^2-4*b*c)^(1/2))
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b*c-a^2>0)', see `assume?` for mo
re deta
```

Fricas [A]
time = 0.37, size = 189, normalized size = 4.02

$$\left[\frac{\log\left(\frac{2\,c^{2}f^{2\,dx+2\,c}+a^{2}-2\,bc+2\,\left(ac-\sqrt{a^{2}-4\,bc}\,c\right)f^{dx+c}-\sqrt{a^{2}-4\,bc}\,a}{cf^{2\,dx+2\,c}+af^{dx+c}+b}\right)}{\sqrt{a^{2}-4\,bc}\,d\log\left(f\right)}, -\frac{2\,\sqrt{-a^{2}+4\,bc}\,\arctan\left(-\frac{2\,\sqrt{-a^{2}+4\,bc}\,cf^{dx+c}+\sqrt{-a^{2}+4\,bc}\,a}{a^{2}-4\,bc}\right)}{(a^{2}-4\,bc)d\log\left(f\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x, algorithm="fricas")
```

```
[Out] [log((2*c^2*f^(2*d*x + 2*c) + a^2 - 2*b*c + 2*(a*c - sqrt(a^2 - 4*b*c)*c)*f
^(d*x + c) - sqrt(a^2 - 4*b*c)*a)/(c*f^(2*d*x + 2*c) + a*f^(d*x + c) + b))/
(sqrt(a^2 - 4*b*c)*d*log(f)), -2*sqrt(-a^2 + 4*b*c)*arctan(-(2*sqrt(-a^2 +
4*b*c)*c*f^(d*x + c) + sqrt(-a^2 + 4*b*c)*a)/(a^2 - 4*b*c))/((a^2 - 4*b*c)*
d*log(f))]
```

Sympy [A]
time = 0.17, size = 66, normalized size = 1.40

$$\operatorname{RootSum}\left(z^{2}\left(a^{2}d^{2}\log\left(f\right)^{2}-4bcd^{2}\log\left(f\right)^{2}\right)-1,\left(i\mapsto i\log\left(f^{c+dx}+\frac{-ia^{2}d\log\left(f\right)+4ibcd\log\left(f\right)+a}{2c}\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*f**(-d*x-c)+c*f**(d*x+c)),x)
```

```
[Out] RootSum(_z**2*(a**2*d**2*log(f)**2 - 4*b*c*d**2*log(f)**2) - 1, Lambda(_i,
_i*log(f**(c + d*x) + (-_i*a**2*d*log(f) + 4*_i*b*c*d*log(f) + a)/(2*c))))
```

Giac [A]
time = 4.93, size = 48, normalized size = 1.02

$$\frac{2 \arctan\left(\frac{2 c f^{dx} f^{c}+a}{\sqrt{-a^{2}+4 bc}}\right)}{\sqrt{-a^{2}+4 bc}\, d \log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x, algorithm="giac")
```

```
[Out] 2*arctan((2*c*f^(d*x)*f^c + a)/sqrt(-a^2 + 4*b*c))/(sqrt(-a^2 + 4*b*c)*d*lo
g(f))
```

Mupad [B]
time = 3.64, size = 47, normalized size = 1.00

$$\frac{2 \operatorname{atan}\left(\frac{a+2 c f^{c+d x}}{\sqrt{4 b c-a^{2}}}\right)}{d \ln\left(f\right) \sqrt{4 b c-a^{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a + c*f^(c + d*x) + b/f^(c + d*x)),x)
```

```
[Out] (2*atan((a + 2*c*f^(c + d*x))/(4*b*c - a^2)^(1/2)))/(d*log(f)*(4*b*c - a^2)
^(1/2))
```

3.541 $\int \frac{x}{a+bf^{-c-dx}+cf^{c+dx}}\,dx$

Optimal. Leaf size=203

$$\frac{x\log\left(1+\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)}-\frac{x\log\left(1+\frac{2cf^{c+dx}}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)}+\frac{\mathrm{Li}_2\left(-\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d^2\log^2(f)}-\frac{\mathrm{Li}_2\left(-\frac{2cf^{c+dx}}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d^2\log^2(f)}$$

```
[Out] x*ln(1+2*c*f^(d*x+c)/(a-(a^2-4*b*c)^(1/2)))/d/ln(f)/(a^2-4*b*c)^(1/2)-x*ln(
1+2*c*f^(d*x+c)/(a+(a^2-4*b*c)^(1/2)))/d/ln(f)/(a^2-4*b*c)^(1/2)+polylog(2,
-2*c*f^(d*x+c)/(a-(a^2-4*b*c)^(1/2)))/d^2/ln(f)^2/(a^2-4*b*c)^(1/2)-polylog
(2,-2*c*f^(d*x+c)/(a+(a^2-4*b*c)^(1/2)))/d^2/ln(f)^2/(a^2-4*b*c)^(1/2)
```

Rubi [A]
time = 0.28, antiderivative size = 203, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$, Rules used = {2299, 2296, 2221, 2317, 2438}

$$\frac{\text{PolyLog}\left(2,-\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{d^2\log^2(f)\sqrt{a^2-4bc}}-\frac{\text{PolyLog}\left(2,-\frac{2cf^{c+dx}}{\sqrt{a^2-4bc}+a}\right)}{d^2\log^2(f)\sqrt{a^2-4bc}}+\frac{x\log\left(\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}+1\right)}{d\log(f)\sqrt{a^2-4bc}}-\frac{x\log\left(\frac{2cf^{c+dx}}{\sqrt{a^2-4bc}+a}+1\right)}{d\log(f)\sqrt{a^2-4bc}}$$

Antiderivative was successfully verified.

```
[In] Int[x/(a + b*f^(-c - d*x) + c*f^(c + d*x)),x]
```

```
[Out] (x*Log[1 + (2*c*f^(c + d*x))/(a - Sqrt[a^2 - 4*b*c])])/(Sqrt[a^2 - 4*b*c]*d
*Log[f]) - (x*Log[1 + (2*c*f^(c + d*x))/(a + Sqrt[a^2 - 4*b*c])])/(Sqrt[a^2
 - 4*b*c]*d*Log[f]) + PolyLog[2, (-2*c*f^(c + d*x))/(a - Sqrt[a^2 - 4*b*c])
]/(Sqrt[a^2 - 4*b*c]*d^2*Log[f]^2) - PolyLog[2, (-2*c*f^(c + d*x))/(a + Sqr
t[a^2 - 4*b*c])]/(Sqrt[a^2 - 4*b*c]*d^2*Log[f]^2)
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2299

```
Int[(u_)/((a_) + (b_.)*(F_)^(v_) + (c_.)*(F_)^(w_)), x_Symbol] :> Int[u*(F^
v/(c + a*F^v + b*F^(2*v))), x] /; FreeQ[{F, a, b, c}, x] && EqQ[w, -v] && L
inearQ[v, x] && If[RationalQ[Coefficient[v, x, 1]], GtQ[Coefficient[v, x, 1
], 0], LtQ[LeafCount[v], LeafCount[w]]]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x}{a+bf^{-c-dx}+cf^{c+dx}}\,dx = \int \frac{f^{c+dx}x}{b+af^{c+dx}+cf^{2(c+dx)}}\,dx$$

$$= \frac{(2c)\int \frac{f^{c+dx}x}{a-\sqrt{a^2-4bc}+2cf^{c+dx}}\,dx}{\sqrt{a^2-4bc}} - \frac{(2c)\int \frac{f^{c+dx}x}{a+\sqrt{a^2-4bc}+2cf^{c+dx}}\,dx}{\sqrt{a^2-4bc}}$$

$$= \frac{x\log\left(1+\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} - \frac{x\log\left(1+\frac{2cf^{c+dx}}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} - \frac{\int \log\left(1+\frac{2cf}{a-\sqrt{a^2}}\right.}{\sqrt{a^2-4bc}\,d}$$

$$= \frac{x\log\left(1+\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} - \frac{x\log\left(1+\frac{2cf^{c+dx}}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} - \frac{\text{Subst}\left(\int \frac{\log\left(1+\right.}{a-}\right.}{\sqrt{a^2-}}$$

$$= \frac{x\log\left(1+\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} - \frac{x\log\left(1+\frac{2cf^{c+dx}}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} + \frac{\text{Li}_2\left(-\frac{2cf^{c+dx}}{a-\sqrt{a^2-4}}\right.}{\sqrt{a^2-4bc}\,d^2\log}$$

Mathematica [F]
time = 0.39, size = 0, normalized size = 0.00

$$\int \frac{x}{a+bf^{-c-dx}+cf^{c+dx}}\,dx$$

Verification is not applicable to the result.

[In] Integrate[x/(a + b*f^(-c - d*x) + c*f^(c + d*x)),x]

[Out] Integrate[x/(a + b*f^(-c - d*x) + c*f^(c + d*x)), x]

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 432 vs. $2(187) = 374$.
time = 0.04, size = 433, normalized size = 2.13

method	result
risch	$\frac{\ln\left(\frac{2b\,f^{-dx}f^{-c}+\sqrt{a^2-4cb}+a}{a+\sqrt{a^2-4cb}}\right)x}{\ln(f)d\sqrt{a^2-4cb}}-\frac{\ln\left(\frac{-2b\,f^{-dx}f^{-c}+\sqrt{a^2-4cb}-a}{-a+\sqrt{a^2-4cb}}\right)x}{\ln(f)d\sqrt{a^2-4cb}}+\frac{\ln\left(\frac{2b\,f^{-dx}f^{-c}+\sqrt{a^2-4cb}+a}{a+\sqrt{a^2-4cb}}\right)c}{\ln(f)d^2\sqrt{a^2-4cb}}-$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x,method=_RETURNVERBOSE)

[Out] 1/ln(f)/d/(a^2-4*b*c)^(1/2)*ln((2*b*f^(-d*x)*f^(-c)+(a^2-4*b*c)^(1/2)+a)/(a+(a^2-4*b*c)^(1/2)))*x-1/ln(f)/d/(a^2-4*b*c)^(1/2)*ln((-2*b*f^(-d*x)*f^(-c)+(a^2-4*b*c)^(1/2)-a)/(-a+(a^2-4*b*c)^(1/2)))*x+1/ln(f)/d^2/(a^2-4*b*c)^(1/2)*ln((2*b*f^(-d*x)*f^(-c)+(a^2-4*b*c)^(1/2)+a)/(a+(a^2-4*b*c)^(1/2)))*c-1/ln(f)/d^2/(a^2-4*b*c)^(1/2)*ln((-2*b*f^(-d*x)*f^(-c)+(a^2-4*b*c)^(1/2)-a)/(-a+(a^2-4*b*c)^(1/2)))*c+1/ln(f)^2/d^2/(a^2-4*b*c)^(1/2)*dilog((-2*b*f^(-d*x)*f^(-c)+(a^2-4*b*c)^(1/2)-a)/(-a+(a^2-4*b*c)^(1/2)))-1/ln(f)^2/d^2/(a^2-4*b*c)^(1/2)*dilog((2*b*f^(-d*x)*f^(-c)+(a^2-4*b*c)^(1/2)+a)/(a+(a^2-4*b*c)^(1/2)))+2/ln(f)/d^2*c/(-a^2+4*b*c)^(1/2)*arctan((2*b*f^(-d*x)*f^(-c)+a)/(-a^2+4*b*c)^(1/2))

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x, algorithm="maxima")

[Out] Exception raised: ValueError >> Computation failed since Maxima requested additional constraints; using the 'assume' command before evaluation *may* help (example of legal syntax is 'assume(a^2-4*b*c>0)', see `assume?` for more deta

Fricas [A]
time = 0.39, size = 353, normalized size = 1.74

$$\frac{bc\sqrt{\frac{a^2-4\,bc}{b^2}}\log\left(2\,cf^{dx+c}+b\sqrt{\frac{a^2-4\,bc}{b^2}}+a\right)\log(f)-bc\sqrt{\frac{a^2-4\,bc}{b^2}}\log\left(2\,cf^{dx+c}-b\sqrt{\frac{a^2-4\,bc}{b^2}}+a\right)\log(f)+(bdx+bc)\sqrt{\frac{a^2-4\,bc}{b^2}}\log(f)\log\left(\frac{\left(b\sqrt{\frac{a^2-4\,bc}{b^2}}+a\right)f^{dx+c}+2\,b}{2\,b}\right)-(bdx+bc)\sqrt{\frac{a^2-4\,bc}{b^2}}\log(f)\log\left(-\frac{\left(b\sqrt{\frac{a^2-4\,bc}{b^2}}-a\right)f^{dx+c}-2\,b}{2\,b}\right)+b\sqrt{\frac{a^2-4\,bc}{b^2}}\,\mathrm{Li}_2\left(-\frac{\left(b\sqrt{\frac{a^2-4\,bc}{b^2}}+a\right)f^{dx+c}+2\,b}{2\,b}+1\right)-b\sqrt{\frac{a^2-4\,bc}{b^2}}\,\mathrm{Li}_2\left(\frac{\left(b\sqrt{\frac{a^2-4\,bc}{b^2}}-a\right)f^{dx+c}-2\,b}{2\,b}+1\right)}{(a^2-4\,bc)d^2\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x, algorithm="fricas")

[Out] (b*c*sqrt((a^2 - 4*b*c)/b^2)*log(2*c*f^(d*x + c) + b*sqrt((a^2 - 4*b*c)/b^2) + a)*log(f) - b*c*sqrt((a^2 - 4*b*c)/b^2)*log(2*c*f^(d*x + c) - b*sqrt((a^2 - 4*b*c)/b^2) + a)*log(f) + (b*d*x + b*c)*sqrt((a^2 - 4*b*c)/b^2)*log(f)*log(1/2*((b*sqrt((a^2 - 4*b*c)/b^2) + a)*f^(d*x + c) + 2*b)/b) - (b*d*x + b*c)*sqrt((a^2 - 4*b*c)/b^2)*log(f)*log(-1/2*((b*sqrt((a^2 - 4*b*c)/b^2) - a)*f^(d*x + c) - 2*b)/b) + b*sqrt((a^2 - 4*b*c)/b^2)*dilog(-1/2*((b*sqrt((a^2 - 4*b*c)/b^2) + a)*f^(d*x + c) + 2*b)/b + 1) - b*sqrt((a^2 - 4*b*c)/b^2)*dilog(1/2*((b*sqrt((a^2 - 4*b*c)/b^2) - a)*f^(d*x + c) - 2*b)/b + 1))/((a^2 - 4*b*c)*d^2*log(f)^2)

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$f^c \int \frac{f^{dx}x}{af^c f^{dx} + b + cf^{2c} f^{2dx}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x/(a+b*f**(-d*x-c)+c*f**(d*x+c)),x)

[Out] f**c*Integral(f**(d*x)*x/(a*f**c*f**(d*x) + b + c*f**(2*c)*f**(2*d*x)), x)

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x, algorithm="giac")

[Out] integrate(x/(c*f^(d*x + c) + b*f^(-d*x - c) + a), x)

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x}{a + c\, f^{c+d\,x} + \frac{b}{f^{c+d\,x}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x/(a + c*f^(c + d*x) + b/f^(c + d*x)),x)

[Out] int(x/(a + c*f^(c + d*x) + b/f^(c + d*x)), x)

3.542 $\int \frac{x^2}{a+bf^{-c-dx}+cf^{c+dx}}\,dx$

Optimal. Leaf size=310

$$\frac{x^2\log\left(1+\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)}-\frac{x^2\log\left(1+\frac{2cf^{c+dx}}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)}+\frac{2x\mathrm{Li}_2\left(-\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d^2\log^2(f)}-\frac{2x\mathrm{Li}_2\left(-\frac{2cf^{c+dx}}{a+\sqrt{a^2-4}}\right.}{\sqrt{a^2-4bc}\,d^2\log^2}$$

```
[Out] x^2*ln(1+2*c*f^(d*x+c)/(a-(a^2-4*b*c)^(1/2)))/d/ln(f)/(a^2-4*b*c)^(1/2)-x^2
*ln(1+2*c*f^(d*x+c)/(a+(a^2-4*b*c)^(1/2)))/d/ln(f)/(a^2-4*b*c)^(1/2)+2*x*po
lylog(2,-2*c*f^(d*x+c)/(a-(a^2-4*b*c)^(1/2)))/d^2/ln(f)^2/(a^2-4*b*c)^(1/2)
-2*x*polylog(2,-2*c*f^(d*x+c)/(a+(a^2-4*b*c)^(1/2)))/d^2/ln(f)^2/(a^2-4*b*c
)^(1/2)-2*polylog(3,-2*c*f^(d*x+c)/(a-(a^2-4*b*c)^(1/2)))/d^3/ln(f)^3/(a^2-
4*b*c)^(1/2)+2*polylog(3,-2*c*f^(d*x+c)/(a+(a^2-4*b*c)^(1/2)))/d^3/ln(f)^3/
(a^2-4*b*c)^(1/2)
```

Rubi [A]
time = 0.46, antiderivative size = 310, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.207$, Rules used = {2299, 2296, 2221, 2611, 2320, 6724}

$$-\frac{2\text{PolyLog}\left(3,-\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{d^3\log^3(f)\sqrt{a^2-4bc}}+\frac{2\text{PolyLog}\left(3,-\frac{2cf^{c+dx}}{\sqrt{a^2-4bc}+a}\right)}{d^3\log^3(f)\sqrt{a^2-4bc}}+\frac{2x\text{PolyLog}\left(2,-\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{d^2\log^2(f)\sqrt{a^2-4bc}}-\frac{2x\text{PolyLog}\left(2,-\frac{2cf^{c+dx}}{\sqrt{a^2-4bc}+a}\right)}{d^2\log^2(f)\sqrt{a^2-4bc}}+\frac{x^2\log\left(\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}+1\right)}{d\log(f)\sqrt{a^2-4bc}}-\frac{x^2\log\left(\frac{2cf^{c+dx}}{\sqrt{a^2-4bc}+a}+1\right)}{d\log(f)\sqrt{a^2-4bc}}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(a + b*f^(-c - d*x) + c*f^(c + d*x)),x]
```

```
[Out] (x^2*Log[1 + (2*c*f^(c + d*x))/(a - Sqrt[a^2 - 4*b*c])])/(Sqrt[a^2 - 4*b*c]
*d*Log[f]) - (x^2*Log[1 + (2*c*f^(c + d*x))/(a + Sqrt[a^2 - 4*b*c])])/(Sqrt
[a^2 - 4*b*c]*d*Log[f]) + (2*x*PolyLog[2, (-2*c*f^(c + d*x))/(a - Sqrt[a^2
- 4*b*c])])/(Sqrt[a^2 - 4*b*c]*d^2*Log[f]^2) - (2*x*PolyLog[2, (-2*c*f^(c +
 d*x))/(a + Sqrt[a^2 - 4*b*c])])/(Sqrt[a^2 - 4*b*c]*d^2*Log[f]^2) - (2*Poly
Log[3, (-2*c*f^(c + d*x))/(a - Sqrt[a^2 - 4*b*c])])/(Sqrt[a^2 - 4*b*c]*d^3*
Log[f]^3) + (2*PolyLog[3, (-2*c*f^(c + d*x))/(a + Sqrt[a^2 - 4*b*c])])/(Sqr
t[a^2 - 4*b*c]*d^3*Log[f]^3)
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2296

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[2*(c/q), Int[
(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Dist[2*(c/q), Int[(f + g*x)^m
*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2299

```
Int[(u_)/((a_) + (b_.)*(F_)^(v_) + (c_.)*(F_)^(w_)), x_Symbol] :> Int[u*(F^
v/(c + a*F^v + b*F^(2*v))), x] /; FreeQ[{F, a, b, c}, x] && EqQ[w, -v] && L
inearQ[v, x] && If[RationalQ[Coefficient[v, x, 1]], GtQ[Coefficient[v, x, 1
], 0], LtQ[LeafCount[v], LeafCount[w]]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^2}{a + bf^{-c-dx} + cf^{c+dx}}\,dx = \int \frac{f^{c+dx}x^2}{b + af^{c+dx} + cf^{2(c+dx)}}\,dx$$

$$= \frac{(2c)\int \frac{f^{c+dx}x^2}{a-\sqrt{a^2-4bc}+2cf^{c+dx}}\,dx}{\sqrt{a^2-4bc}} - \frac{(2c)\int \frac{f^{c+dx}x^2}{a+\sqrt{a^2-4bc}+2cf^{c+dx}}\,dx}{\sqrt{a^2-4bc}}$$

$$= \frac{x^2\log\left(1+\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} - \frac{x^2\log\left(1+\frac{2cf^{c+dx}}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} - \frac{2\int x\log\left(1+ \cdots\right.}{\sqrt{a^2- \cdots}}$$

$$= \frac{x^2\log\left(1+\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} - \frac{x^2\log\left(1+\frac{2cf^{c+dx}}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} + \frac{2x\mathrm{Li}_2\left(-\frac{2\cdots}{a-\sqrt{\cdots}}\right.}{\sqrt{a^2-4bc}\,d\cdots}$$

$$= \frac{x^2\log\left(1+\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} - \frac{x^2\log\left(1+\frac{2cf^{c+dx}}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} + \frac{2x\mathrm{Li}_2\left(-\frac{2\cdots}{a-\sqrt{\cdots}}\right.}{\sqrt{a^2-4bc}\,d\cdots}$$

$$= \frac{x^2\log\left(1+\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} - \frac{x^2\log\left(1+\frac{2cf^{c+dx}}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} + \frac{2x\mathrm{Li}_2\left(-\frac{2\cdots}{a-\sqrt{\cdots}}\right.}{\sqrt{a^2-4bc}\,d\cdots}$$

Mathematica [F]
time = 0.22, size = 0, normalized size = 0.00

$$\int \frac{x^2}{a + bf^{-c-dx} + cf^{c+dx}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[x^2/(a + b*f^(-c - d*x) + c*f^(c + d*x)),x]
```

```
[Out] Integrate[x^2/(a + b*f^(-c - d*x) + c*f^(c + d*x)), x]
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{x^2}{a + b\,f^{-dx-c} + c\,f^{dx+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x)
```

```
[Out] int(x^2/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(a^2-4*b*c>0)', see `assume?` for mo
re deta
```

Fricas [A]
time = 0.38, size = 489, normalized size = 1.58

$$-\frac{bc^2\sqrt{\frac{a^2-4bc}{b^2}}\log\left(2cf^{dx+c}+b\sqrt{\frac{a^2-4bc}{b^2}}+a\right)\log(f)^2-bc^2\sqrt{\frac{a^2-4bc}{b^2}}\log\left(2cf^{dx+c}-b\sqrt{\frac{a^2-4bc}{b^2}}+a\right)\log(f)^2-2bdx\sqrt{\frac{a^2-4bc}{b^2}}\,\mathrm{Li}_2\left(-\frac{\left(b\sqrt{\frac{a^2-4bc}{b^2}}+a\right)f^{dx+c}+2b}{2b}+1\right)\log(f)+2bdx\sqrt{\frac{a^2-4bc}{b^2}}\,\mathrm{Li}_2\left(\frac{\left(b\sqrt{\frac{a^2-4bc}{b^2}}-a\right)f^{dx+c}-2b}{2b}+1\right)\log(f)-(bd^2x^2-bc^2)\sqrt{\frac{a^2-4bc}{b^2}}\log(f)^2\log\left(\frac{\left(b\sqrt{\frac{a^2-4bc}{b^2}}+a\right)f^{dx+c}+2b}{2b}\right)+(bd^2x^2-bc^2)\sqrt{\frac{a^2-4bc}{b^2}}\log(f)^2\log\left(-\frac{\left(b\sqrt{\frac{a^2-4bc}{b^2}}-a\right)f^{dx+c}-2b}{2b}\right)+2b\sqrt{\frac{a^2-4bc}{b^2}}\,\mathrm{polylog}\left(3,-\frac{\left(b\sqrt{\frac{a^2-4bc}{b^2}}+a\right)f^{dx+c}}{2b}\right)-2b\sqrt{\frac{a^2-4bc}{b^2}}\,\mathrm{polylog}\left(3,\frac{\left(b\sqrt{\frac{a^2-4bc}{b^2}}-a\right)f^{dx+c}}{2b}\right)}{(a^2-4bc)d^3\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x, algorithm="fricas")
```

```
[Out] -(b*c^2*sqrt((a^2 - 4*b*c)/b^2)*log(2*c*f^(d*x + c) + b*sqrt((a^2 - 4*b*c)/
b^2) + a)*log(f)^2 - b*c^2*sqrt((a^2 - 4*b*c)/b^2)*log(2*c*f^(d*x + c) - b*
sqrt((a^2 - 4*b*c)/b^2) + a)*log(f)^2 - 2*b*d*x*sqrt((a^2 - 4*b*c)/b^2)*dil
og(-1/2*((b*sqrt((a^2 - 4*b*c)/b^2) + a)*f^(d*x + c) + 2*b)/b + 1)*log(f) +
 2*b*d*x*sqrt((a^2 - 4*b*c)/b^2)*dilog(1/2*((b*sqrt((a^2 - 4*b*c)/b^2) - a)
*f^(d*x + c) - 2*b)/b + 1)*log(f) - (b*d^2*x^2 - b*c^2)*sqrt((a^2 - 4*b*c)/
b^2)*log(f)^2*log(1/2*((b*sqrt((a^2 - 4*b*c)/b^2) + a)*f^(d*x + c) + 2*b)/b
) + (b*d^2*x^2 - b*c^2)*sqrt((a^2 - 4*b*c)/b^2)*log(f)^2*log(-1/2*((b*sqrt(
(a^2 - 4*b*c)/b^2) - a)*f^(d*x + c) - 2*b)/b) + 2*b*sqrt((a^2 - 4*b*c)/b^2)
*polylog(3, -1/2*(b*sqrt((a^2 - 4*b*c)/b^2) + a)*f^(d*x + c)/b) - 2*b*sqrt(
(a^2 - 4*b*c)/b^2)*polylog(3, 1/2*(b*sqrt((a^2 - 4*b*c)/b^2) - a)*f^(d*x +
c)/b))/((a^2 - 4*b*c)*d^3*log(f)^3)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a+b*f**(-d*x-c)+c*f**(d*x+c)),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x, algorithm="giac")
[Out] integrate(x^2/(c*f^(d*x + c) + b*f^(-d*x - c) + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2}{a+c\,f^{c+d\,x}+\frac{b}{f^{c+d\,x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a + c*f^(c + d*x) + b/f^(c + d*x)),x)
[Out] int(x^2/(a + c*f^(c + d*x) + b/f^(c + d*x)), x)
```

3.543 $\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^n}{df+(ef+dg)x+egx^2}\,dx$

Optimal. Leaf size=53

$$\text{Int}\left(\frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^n}{df+(ef+dg)x+egx^2},x\right)$$

```
[Out] Unintegrable((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^n/(d*f+(d*g+e*f)*x+e*g
*x^2),x)
```

Rubi [A]
time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^n}{df+(ef+dg)x+egx^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^n/(d*f + (e*f + d*g)*x + e*
g*x^2),x]
```

```
[Out] Defer[Int][(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^n/(d*f + (e*f + d*g)
*x + e*g*x^2), x]
```

Rubi steps

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^n}{df+(ef+dg)x+egx^2}\,dx = \int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^n}{df+(ef+dg)x+egx^2}\,dx$$

Mathematica [A]
time = 0.29, size = 0, normalized size = 0.00

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^n}{df+(ef+dg)x+egx^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^n/(d*f + (e*f + d*g)*
x + e*g*x^2),x]
```

```
[Out] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^n/(d*f + (e*f + d*g)*
x + e*g*x^2), x]
```

Maple [A]
time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\,F^{\frac{c\sqrt{ex+d}}{\sqrt{gx+f}}}\right)^{n}}{df+\left(dg+ef\right)x+eg\,x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^n/(d*f+(d*g+e*f)*x+e*g*x^2),x)
```

```
[Out] int((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^n/(d*f+(d*g+e*f)*x+e*g*x^2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^n/(d*f+(d*g+e*f)*x+e*g*x^
2),x, algorithm="maxima")
```

```
[Out] integrate((F^(sqrt(e*x + d)*c/sqrt(g*x + f))*b + a)^n/(e*g*x^2 + d*f + (e*f
 + d*g)*x), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^n/(d*f+(d*g+e*f)*x+e*g*x^
2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   alglo
gextint: unimplemented
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(F^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\,b+a\right)^{n}}{\left(d+ex\right)\left(f+gx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F**(c*(e*x+d)**(1/2)/(g*x+f)**(1/2)))**n/(d*f+(d*g+e*f)*x+e*
g*x**2),x)
```

```
[Out] Integral((F**(c*sqrt(d + e*x)/sqrt(f + g*x))*b + a)**n/((d + e*x)*(f + g*x)
), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^n/(d*f+(d*g+e*f)*x+e*g*x^
2),x, algorithm="giac")
```

```
[Out] integrate((F^(sqrt(x*e + d)*c/sqrt(g*x + f))*b + a)^n/(g*x^2*e + d*f + (d*g
 + f*e)*x), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\left(a+F^{\frac{c\,\sqrt{d+e\,x}}{\sqrt{f+g\,x}}}\,b\right)^n}{e\,g\,x^2+\left(d\,g+e\,f\right)\,x+d\,f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + F^((c*(d + e*x)^(1/2))/(f + g*x)^(1/2))*b)^n/(d*f + x*(d*g + e*f)
+ e*g*x^2),x)
```

```
[Out] int((a + F^((c*(d + e*x)^(1/2))/(f + g*x)^(1/2))*b)^n/(d*f + x*(d*g + e*f)
+ e*g*x^2), x)
```

3.544 $\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^3}{df+(ef+dg)x+egx^2}\,dx$

Optimal. Leaf size=154

$$\frac{6a^2b\text{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{6ab^2\text{Ei}\left(\frac{2c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{2b^3\text{Ei}\left(\frac{3c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{2a^3\log\left(\frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}$$

```
[Out] 6*a^2*b*Ei(c*ln(F)*(e*x+d)^(1/2)/(g*x+f)^(1/2))/(-d*g+e*f)+6*a*b^2*Ei(2*c*l
n(F)*(e*x+d)^(1/2)/(g*x+f)^(1/2))/(-d*g+e*f)+2*b^3*Ei(3*c*ln(F)*(e*x+d)^(1/
2)/(g*x+f)^(1/2))/(-d*g+e*f)+2*a^3*ln((e*x+d)^(1/2)/(g*x+f)^(1/2))/(-d*g+e*
f)
```

Rubi [A]

time = 0.18, antiderivative size = 154, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 50, $\frac{\text{number of rules}}{\text{integrand size}} = 0.060$, Rules used = {2328, 2214, 2209}

$$\frac{2a^3\log\left(\frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{6a^2b\text{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{6ab^2\text{Ei}\left(\frac{2c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{2b^3\text{Ei}\left(\frac{3c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^3/(d*f + (e*f + d*g)*x + e*
g*x^2),x]
```

```
[Out] (6*a^2*b*ExpIntegralEi[(c*Sqrt[d + e*x]*Log[F])/Sqrt[f + g*x]])/(e*f - d*g)
 + (6*a*b^2*ExpIntegralEi[(2*c*Sqrt[d + e*x]*Log[F])/Sqrt[f + g*x]])/(e*f -
 d*g) + (2*b^3*ExpIntegralEi[(3*c*Sqrt[d + e*x]*Log[F])/Sqrt[f + g*x]])/(e*
f - d*g) + (2*a^3*Log[Sqrt[d + e*x]/Sqrt[f + g*x]])/(e*f - d*g)
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2214

```
Int[((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) +
 (d_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*(F
^(g*(e + f*x)))^n)^p, x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m, n}, x] &&
```

```
IGtQ[p, 0]
```

Rule 2328

```
Int[((a_.) + (b_.)*(F_)^(((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.
)*(x_)]))^(n_.)/((A_.) + (B_.)*(x_) + (C_.)*(x_)^2), x_Symbol] :> Dist[2*e*
(g/(C*(e*f - d*g))), Subst[Int[(a + b*F^(c*x))^n/x, x], x, Sqrt[d + e*x]/Sq
rt[f + g*x]], x] /; FreeQ[{a, b, c, d, e, f, g, A, B, C, F}, x] && EqQ[C*d*
f - A*e*g, 0] && EqQ[B*e*g - C*(e*f + d*g), 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^3}{df+(ef+dg)x+egx^2}\,dx = \frac{2\text{Subst}\left(\int \frac{(a+bF^{cx})^3}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}$$
$$= \frac{2\text{Subst}\left(\int \left(\frac{a^3}{x}+\frac{3a^2bF^{cx}}{x}+\frac{3ab^2F^{2cx}}{x}+\frac{b^3F^{3cx}}{x}\right)dx, x, \frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}$$
$$= \frac{2a^3\log\left(\frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{(6a^2b)\,\text{Subst}\left(\int \frac{F^{cx}}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{(6ab^2)\,\text{Su}}{}$$
$$= \frac{6a^2b\,\text{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{6ab^2\,\text{Ei}\left(\frac{2c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{2b^3\text{Ei}\left(\frac{3c\sqrt{d+e}}{\sqrt{f+}}\right.}{ef-d}$$

Mathematica [F]
time = 0.64, size = 0, normalized size = 0.00

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^3}{df+(ef+dg)x+egx^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^3/(d*f + (e*f + d*g)*
x + e*g*x^2),x]
```

```
[Out] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^3/(d*f + (e*f + d*g)*
x + e*g*x^2), x]
```

Maple [F]
time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\,F^{\frac{c\sqrt{ex+d}}{\sqrt{gx+f}}}\right)^{3}}{df+\left(dg+ef\right)x+eg\,x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^3/(d*f+(d*g+e*f)*x+e*g*x^2),x)
```

```
[Out] int((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^3/(d*f+(d*g+e*f)*x+e*g*x^2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^3/(d*f+(d*g+e*f)*x+e*g*x^
2),x, algorithm="maxima")
```

```
[Out] a^3*(log(e*x + d)/(e*f - d*g) - log(g*x + f)/(e*f - d*g)) + b^3*integrate(F
^(3*sqrt(e*x + d)*c/sqrt(g*x + f))/(e*g*x^2 + d*f + (e*f + d*g)*x), x) + 3*
a*b^2*integrate(F^(2*sqrt(e*x + d)*c/sqrt(g*x + f))/(e*g*x^2 + d*f + (e*f +
 d*g)*x), x) + 3*a^2*b*integrate(F^(sqrt(e*x + d)*c/sqrt(g*x + f))/(e*g*x^2
 + d*f + (e*f + d*g)*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^3/(d*f+(d*g+e*f)*x+e*g*x^
2),x, algorithm="fricas")
```

```
[Out] integral((3*F^(sqrt(x*e + d)*c/sqrt(g*x + f))*a^2*b + 3*F^(2*sqrt(x*e + d)*
c/sqrt(g*x + f))*a*b^2 + F^(3*sqrt(x*e + d)*c/sqrt(g*x + f))*b^3 + a^3)/(d*
g*x + d*f + (g*x^2 + f*x)*e), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(F^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}b+a\right)^{3}}{\left(d+ex\right)\left(f+gx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F**(c*(e*x+d)**(1/2)/(g*x+f)**(1/2)))**3/(d*f+(d*g+e*f)*x+e*
g*x**2),x)
```

```
[Out] Integral((F**(c*sqrt(d + e*x)/sqrt(f + g*x))*b + a)**3/((d + e*x)*(f + g*x)
), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^3/(d*f+(d*g+e*f)*x+e*g*x^
2),x, algorithm="giac")
```

```
[Out] integrate((F^(sqrt(x*e + d)*c/sqrt(g*x + f))*b + a)^3/(g*x^2*e + d*f + (d*g
 + f*e)*x), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+F^{\frac{c\,\sqrt{d+e\,x}}{\sqrt{f+g\,x}}}\,b\right)^3}{e\,g\,x^2+\left(d\,g+e\,f\right)\,x+d\,f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + F^((c*(d + e*x)^(1/2))/(f + g*x)^(1/2))*b)^3/(d*f + x*(d*g + e*f)
+ e*g*x^2),x)
```

```
[Out] int((a + F^((c*(d + e*x)^(1/2))/(f + g*x)^(1/2))*b)^3/(d*f + x*(d*g + e*f)
+ e*g*x^2), x)
```

3.545 $\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^2}{df+(ef+dg)x+egx^2}\,dx$

Optimal. Leaf size=112

$$\frac{4ab\operatorname{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{2b^2\operatorname{Ei}\left(\frac{2c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{2a^2\log\left(\frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}$$

```
[Out] 4*a*b*Ei(c*ln(F)*(e*x+d)^(1/2)/(g*x+f)^(1/2))/(-d*g+e*f)+2*b^2*Ei(2*c*ln(F)
*(e*x+d)^(1/2)/(g*x+f)^(1/2))/(-d*g+e*f)+2*a^2*ln((e*x+d)^(1/2)/(g*x+f)^(1/
2))/(-d*g+e*f)
```

Rubi [A]
time = 0.15, antiderivative size = 112, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 50, $\frac{\text{number of rules}}{\text{integrand size}} = 0.060$, Rules used = {2328, 2214, 2209}

$$\frac{2a^2\log\left(\frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{4ab\operatorname{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{2b^2\operatorname{Ei}\left(\frac{2c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^2/(d*f + (e*f + d*g)*x + e*
g*x^2),x]
```

```
[Out] (4*a*b*ExpIntegralEi[(c*Sqrt[d + e*x]*Log[F])/Sqrt[f + g*x]])/(e*f - d*g) +
 (2*b^2*ExpIntegralEi[(2*c*Sqrt[d + e*x]*Log[F])/Sqrt[f + g*x]])/(e*f - d*g
) + (2*a^2*Log[Sqrt[d + e*x]/Sqrt[f + g*x]])/(e*f - d*g)
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2214

```
Int[((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) +
 (d_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*(F
^(g*(e + f*x)))^n)^p, x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m, n}, x] &&
 IGtQ[p, 0]
```

Rule 2328

```
Int[((a_.) + (b_.)*(F_)^(((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.
)*(x_)]))^(n_.)/((A_.) + (B_.)*(x_) + (C_.)*(x_)^2), x_Symbol] :> Dist[2*e*
(g/(C*(e*f - d*g))), Subst[Int[(a + b*F^(c*x))^n/x, x], x, Sqrt[d + e*x]/Sq
rt[f + g*x]], x] /; FreeQ[{a, b, c, d, e, f, g, A, B, C, F}, x] && EqQ[C*d*
f - A*e*g, 0] && EqQ[B*e*g - C*(e*f + d*g), 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^2}{df+(ef+dg)x+egx^2}\,dx = \frac{2\text{Subst}\left(\int \frac{(a+bF^{cx})^2}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}$$

$$= \frac{2\text{Subst}\left(\int \left(\frac{a^2}{x}+\frac{2abF^{cx}}{x}+\frac{b^2F^{2cx}}{x}\right)\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}$$

$$= \frac{2a^2\log\left(\frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{(4ab)\text{Subst}\left(\int \frac{F^{cx}}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{(2b^2)\,\text{Subs}}{}$$

$$= \frac{4ab\text{Ei}\left(\frac{c\sqrt{d+ex}\,\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{2b^2\text{Ei}\left(\frac{2c\sqrt{d+ex}\,\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{2a^2\log\left(\frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}$$

Mathematica [F]
time = 0.64, size = 0, normalized size = 0.00

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^2}{df+(ef+dg)x+egx^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^2/(d*f + (e*f + d*g)*
x + e*g*x^2),x]
```

```
[Out] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^2/(d*f + (e*f + d*g)*
x + e*g*x^2), x]
```

Maple [F]
time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\,F^{\frac{c\sqrt{ex+d}}{\sqrt{gx+f}}}\right)^2}{df+(dg+ef)\,x+eg\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^2/(d*f+(d*g+e*f)*x+e*g*x^2),x)
```

```
[Out] int((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^2/(d*f+(d*g+e*f)*x+e*g*x^2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^2/(d*f+(d*g+e*f)*x+e*g*x^
2),x, algorithm="maxima")
```

```
[Out] a^2*(log(e*x + d)/(e*f - d*g) - log(g*x + f)/(e*f - d*g)) + b^2*integrate(F
^(2*sqrt(e*x + d)*c/sqrt(g*x + f))/(e*g*x^2 + d*f + (e*f + d*g)*x), x) + 2*
a*b*integrate(F^(sqrt(e*x + d)*c/sqrt(g*x + f))/(e*g*x^2 + d*f + (e*f + d*g
)*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^2/(d*f+(d*g+e*f)*x+e*g*x^
2),x, algorithm="fricas")
```

```
[Out] integral((2*F^(sqrt(x*e + d)*c/sqrt(g*x + f))*a*b + F^(2*sqrt(x*e + d)*c/sq
rt(g*x + f))*b^2 + a^2)/(d*g*x + d*f + (g*x^2 + f*x)*e), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(F^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}} b + a\right)^2}{(d+ex)\,(f+gx)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F**(c*(e*x+d)**(1/2)/(g*x+f)**(1/2)))**2/(d*f+(d*g+e*f)*x+e*
g*x**2),x)
```

```
[Out] Integral((F**(c*sqrt(d + e*x)/sqrt(f + g*x))*b + a)**2/((d + e*x)*(f + g*x)
), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^2/(d*f+(d*g+e*f)*x+e*g*x^
2),x, algorithm="giac")
```

```
[Out] integrate((F^(sqrt(x*e + d)*c/sqrt(g*x + f))*b + a)^2/(g*x^2*e + d*f + (d*g
 + f*e)*x), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+F^{\frac{c\,\sqrt{d+e\,x}}{\sqrt{f+g\,x}}}\,b\right)^2}{e\,g\,x^2+\left(d\,g+e\,f\right)\,x+d\,f} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + F^((c*(d + e*x)^(1/2))/(f + g*x)^(1/2))*b)^2/(d*f + x*(d*g + e*f)
+ e*g*x^2),x)
```

```
[Out] int((a + F^((c*(d + e*x)^(1/2))/(f + g*x)^(1/2))*b)^2/(d*f + x*(d*g + e*f)
+ e*g*x^2), x)
```

3.546 $\int \frac{a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}}{df+(ef+dg)x+egx^2}\,dx$

Optimal. Leaf size=70

$$\frac{2b\text{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{2a\log\left(\frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}$$

```
[Out] 2*b*Ei(c*ln(F)*(e*x+d)^(1/2)/(g*x+f)^(1/2))/(-d*g+e*f)+2*a*ln((e*x+d)^(1/2)
/(g*x+f)^(1/2))/(-d*g+e*f)
```

Rubi [A]
time = 0.09, antiderivative size = 70, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 48, $\frac{\text{number of rules}}{\text{integrand size}} = 0.062$, Rules used = {2328, 14, 2209}

$$\frac{2a\log\left(\frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{2b\text{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))/(d*f + (e*f + d*g)*x + e*g*
x^2),x]
```

```
[Out] (2*b*ExpIntegralEi[(c*Sqrt[d + e*x]*Log[F])/Sqrt[f + g*x]])/(e*f - d*g) + (
2*a*Log[Sqrt[d + e*x]/Sqrt[f + g*x]])/(e*f - d*g)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] && !TrueQ[$UseGamma]
```

Rule 2328

```
Int[((a_.) + (b_.)*(F_)^(((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.
)*(x_)]))^(n_.)/((A_.) + (B_.)*(x_) + (C_.)*(x_)^2), x_Symbol] :> Dist[2*e*
(g/(C*(e*f - d*g))), Subst[Int[(a + b*F^(c*x))^n/x, x], x, Sqrt[d + e*x]/Sq
```

```
rt[f + g*x]], x] /; FreeQ[{a, b, c, d, e, f, g, A, B, C, F}, x] && EqQ[C*d*
f - A*e*g, 0] && EqQ[B*e*g - C*(e*f + d*g), 0] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}}{df+(ef+dg)x+egx^2}\,dx &= \frac{2\text{Subst}\left(\int \frac{a+bF^{cx}}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg} \\
&= \frac{2\text{Subst}\left(\int \left(\frac{a}{x}+\frac{bF^{cx}}{x}\right)\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg} \\
&= \frac{2a\log\left(\frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{(2b)\text{Subst}\left(\int \frac{F^{cx}}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg} \\
&= \frac{2b\text{Ei}\left(\frac{c\sqrt{d+ex}\,\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{2a\log\left(\frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}
\end{aligned}$$

Mathematica [F]
time = 0.28, size = 0, normalized size = 0.00

$$\int \frac{a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}}{df+(ef+dg)x+egx^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))/(d*f + (e*f + d*g)*x
+ e*g*x^2),x]
[Out] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))/(d*f + (e*f + d*g)*x
+ e*g*x^2), x]
```

Maple [F]
time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{a+b\,F^{\frac{c\sqrt{ex+d}}{\sqrt{gx+f}}}}{df+(dg+ef)\,x+eg\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))/(d*f+(d*g+e*f)*x+e*g*x^2),x)
```

```
[Out] int((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))/(d*f+(d*g+e*f)*x+e*g*x^2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))/(d*f+(d*g+e*f)*x+e*g*x^2)
,x, algorithm="maxima")
```

```
[Out] a*(log(e*x + d)/(e*f - d*g) - log(g*x + f)/(e*f - d*g)) + b*integrate(F^(sq
rt(e*x + d)*c/sqrt(g*x + f))/(e*g*x^2 + d*f + (e*f + d*g)*x), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))/(d*f+(d*g+e*f)*x+e*g*x^2)
,x, algorithm="fricas")
```

```
[Out] integral((F^(sqrt(x*e + d)*c/sqrt(g*x + f))*b + a)/(d*g*x + d*f + (g*x^2 +
f*x)*e), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}} b + a}{(d+ex)(f+gx)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F**(c*(e*x+d)**(1/2)/(g*x+f)**(1/2)))/(d*f+(d*g+e*f)*x+e*g*x
**2),x)
```

```
[Out] Integral((F**(c*sqrt(d + e*x)/sqrt(f + g*x))*b + a)/((d + e*x)*(f + g*x)),
x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))/(d*f+(d*g+e*f)*x+e*g*x^2)
,x, algorithm="giac")
```

```
[Out] integrate((F^(sqrt(x*e + d)*c/sqrt(g*x + f))*b + a)/(g*x^2*e + d*f + (d*g +
 f*e)*x), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+F^{\frac{c\,\sqrt{d+e\,x}}{\sqrt{f+g\,x}}}\,b}{e\,g\,x^2+(d\,g+e\,f)\,x+d\,f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + F^((c*(d + e*x)^(1/2))/(f + g*x)^(1/2))*b)/(d*f + x*(d*g + e*f) +
e*g*x^2),x)
```

```
[Out] int((a + F^((c*(d + e*x)^(1/2))/(f + g*x)^(1/2))*b)/(d*f + x*(d*g + e*f) +
e*g*x^2), x)
```

3.547 $\int \frac{1}{df+(ef+dg)x+egx^2}\,dx$

Optimal. Leaf size=36

$$\frac{\log(d+ex)}{ef-dg}-\frac{\log(f+gx)}{ef-dg}$$

```
[Out] ln(e*x+d)/(-d*g+e*f)-ln(g*x+f)/(-d*g+e*f)
```

Rubi [A]
time = 0.01, antiderivative size = 36, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {630, 31}

$$\frac{\log(d+ex)}{ef-dg}-\frac{\log(f+gx)}{ef-dg}$$

Antiderivative was successfully verified.

```
[In] Int[(d*f + (e*f + d*g)*x + e*g*x^2)^(-1),x]
```

```
[Out] Log[d + e*x]/(e*f - d*g) - Log[f + g*x]/(e*f - d*g)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 630

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[c/q, Int[1/Simp[b/2 - q/2 + c*x, x], x], x] - Dist[c/q, Int[1/Simp[b/2 + q/2 + c*x, x], x], x]] /; FreeQ[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0] && PosQ[b^2 - 4*a*c] && PerfectSquareQ[b^2 - 4*a*c]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{df+(ef+dg)x+egx^2}\,dx &= -\frac{(eg)\int \frac{1}{ef+egx}\,dx}{ef-dg}+\frac{(eg)\int \frac{1}{dg+egx}\,dx}{ef-dg}\\ &= \frac{\log(d+ex)}{ef-dg}-\frac{\log(f+gx)}{ef-dg}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 26, normalized size = 0.72

$$\frac{\log(d+ex)-\log(f+gx)}{ef-dg}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*f + (e*f + d*g)*x + e*g*x^2)^(-1),x]
[Out] (Log[d + e*x] - Log[f + g*x])/(e*f - d*g)
```

Maple [A]
time = 0.12, size = 37, normalized size = 1.03

method	result	size
default	$-\frac{\ln(ex+d)}{dg-ef}+\frac{\ln(gx+f)}{dg-ef}$	37
norman	$-\frac{\ln(ex+d)}{dg-ef}+\frac{\ln(gx+f)}{dg-ef}$	37
risch	$-\frac{\ln(ex+d)}{dg-ef}+\frac{\ln(-gx-f)}{dg-ef}$	40

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*f+(d*g+e*f)*x+e*g*x^2),x,method=_RETURNVERBOSE)
[Out] -1/(d*g-e*f)*ln(e*x+d)+1/(d*g-e*f)*ln(g*x+f)
```

Maxima [A]
time = 0.32, size = 36, normalized size = 1.00

$$\frac{\log\left(ex+d\right)}{ef-dg}-\frac{\log\left(gx+f\right)}{ef-dg}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*f+(d*g+e*f)*x+e*g*x^2),x, algorithm="maxima")
[Out] log(e*x + d)/(e*f - d*g) - log(g*x + f)/(e*f - d*g)
```

Fricas [A]
time = 0.40, size = 28, normalized size = 0.78

$$\frac{\log\left(gx+f\right)-\log\left(xe+d\right)}{dg-fe}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*f+(d*g+e*f)*x+e*g*x^2),x, algorithm="fricas")
[Out] (log(g*x + f) - log(x*e + d))/(d*g - f*e)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 128 vs. $2(26) = 52$.
time = 0.16, size = 128, normalized size = 3.56

$$\frac{\log\left(x+\frac{-\frac{d^2g^2}{dg-ef}+\frac{2defg}{dg-ef}+dg-\frac{e^2f^2}{dg-ef}+ef}{2eg}\right)}{dg-ef}-\frac{\log\left(x+\frac{\frac{d^2g^2}{dg-ef}-\frac{2defg}{dg-ef}+dg+\frac{e^2f^2}{dg-ef}+ef}{2eg}\right)}{dg-ef}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*f+(d*g+e*f)*x+e*g*x**2),x)
```

```
[Out] log(x + (-d**2*g**2/(d*g - e*f) + 2*d*e*f*g/(d*g - e*f) + d*g - e**2*f**2/(
d*g - e*f) + e*f)/(2*e*g))/(d*g - e*f) - log(x + (d**2*g**2/(d*g - e*f) - 2
*d*e*f*g/(d*g - e*f) + d*g + e**2*f**2/(d*g - e*f) + e*f)/(2*e*g))/(d*g - e
*f)
```

Giac [A]
time = 4.79, size = 49, normalized size = 1.36

$$\frac{g\log\left(|gx+f|\right)}{dg^2-fge}-\frac{e\log\left(|xe+d|\right)}{dge-fe^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*f+(d*g+e*f)*x+e*g*x^2),x, algorithm="giac")
```

```
[Out] g*log(abs(g*x + f))/(d*g^2 - f*g*e) - e*log(abs(x*e + d))/(d*g*e - f*e^2)
```

Mupad [B]
time = 0.10, size = 40, normalized size = 1.11

$$\frac{\operatorname{atan}\left(\frac{e\,f\,2\mathrm{i}+e\,g\,x\,2\mathrm{i}}{d\,g-e\,f}+1\mathrm{i}\right)\,2\mathrm{i}}{d\,g-e\,f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*f + x*(d*g + e*f) + e*g*x^2),x)
```

```
[Out] (atan((e*f*2i + e*g*x*2i)/(d*g - e*f) + 1i)*2i)/(d*g - e*f)
```

3.548 $\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)(df+(ef+dg)x+egx^2)}\,dx$

Optimal. Leaf size=53

$$\text{Int}\left(\frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)(df+(ef+dg)x+egx^2)},x\right)$$

```
[Out] Unintegrable(1/(a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))/(d*f+(d*g+e*f)*x+e*g
*x^2),x)
```

Rubi [A]
time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)(df+(ef+dg)x+egx^2)}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))*(d*f + (e*f + d*g)*x + e
*g*x^2)),x]
```

```
[Out] Defer[Int][1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))*(d*f + (e*f + d*g
)*x + e*g*x^2)), x]
```

Rubi steps

$$\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)(df+(ef+dg)x+egx^2)}\,dx = \int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)(df+(ef+dg)x+egx^2)}\,dx$$

Mathematica [A]
time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)(df+(ef+dg)x+egx^2)}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))*(d*f + (e*f + d*g)
*x + e*g*x^2)),x]
```

```
[Out] Integrate[1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))*(d*f + (e*f + d*g)
*x + e*g*x^2)), x]
```

Maple [A]
time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a+b\,F^{\frac{c\sqrt{ex+d}}{\sqrt{gx+f}}}\right)\left(df+\left(dg+ef\right)x+eg\,x^{2}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))/(d*f+(d*g+e*f)*x+e*g*x^2),x)
```

```
[Out] int(1/(a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))/(d*f+(d*g+e*f)*x+e*g*x^2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))/(d*f+(d*g+e*f)*x+e*g*x^
2),x, algorithm="maxima")
```

```
[Out] integrate(1/((e*g*x^2 + d*f + (e*f + d*g)*x)*(F^(sqrt(e*x + d)*c/sqrt(g*x +
 f))*b + a)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))/(d*f+(d*g+e*f)*x+e*g*x^
2),x, algorithm="fricas")
```

```
[Out] integral(1/(a*d*g*x + a*d*f + (b*d*g*x + b*d*f + (b*g*x^2 + b*f*x)*e)*F^(sq
rt(x*e + d)*c/sqrt(g*x + f)) + (a*g*x^2 + a*f*x)*e), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d+ex\right)\left(f+gx\right)\left(F^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}b+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F**(c*(e*x+d)**(1/2)/(g*x+f)**(1/2)))/(d*f+(d*g+e*f)*x+e*g
*x**2),x)
```

```
[Out] Integral(1/((d + e*x)*(f + g*x)*(F**(c*sqrt(d + e*x)/sqrt(f + g*x))*b + a))
, x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))/(d*f+(d*g+e*f)*x+e*g*x^
2),x, algorithm="giac")
```

```
[Out] integrate(1/((g*x^2*e + d*f + (d*g + f*e)*x)*(F^(sqrt(x*e + d)*c/sqrt(g*x +
 f))*b + a)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{\left(a+F^{\frac{c\,\sqrt{d+e\,x}}{\sqrt{f+g\,x}}}\,b\right)\,\left(e\,g\,x^2+\left(d\,g+e\,f\right)\,x+d\,f\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + F^((c*(d + e*x)^(1/2))/(f + g*x)^(1/2))*b)*(d*f + x*(d*g + e*f)
 + e*g*x^2)),x)
```

```
[Out] int(1/((a + F^((c*(d + e*x)^(1/2))/(f + g*x)^(1/2))*b)*(d*f + x*(d*g + e*f)
 + e*g*x^2)), x)
```

3.549 $\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^2 (df+(ef+dg)x+egx^2)} \, dx$

Optimal. Leaf size=53

$$\text{Int}\left(\frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^2 (df+(ef+dg)x+egx^2)}, x\right)$$

```
[Out] Unintegrable(1/(a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^2/(d*f+(d*g+e*f)*x+e
*g*x^2),x)
```

Rubi [A]
time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^2 (df+(ef+dg)x+egx^2)} \, dx$$

Verification is not applicable to the result.

```
[In] Int[1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^2*(d*f + (e*f + d*g)*x +
 e*g*x^2)),x]
```

```
[Out] Defer[Int][1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^2*(d*f + (e*f + d
*g)*x + e*g*x^2)), x]
```

Rubi steps

$$\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^2 (df+(ef+dg)x+egx^2)} \, dx = \int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^2 (df+(ef+dg)x+egx^2)} \, dx$$

Mathematica [A]
time = 0.71, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^2 (df+(ef+dg)x+egx^2)} \, dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^2*(d*f + (e*f + d*
g)*x + e*g*x^2)),x]
```

```
[Out] Integrate[1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^2*(d*f + (e*f + d*
g)*x + e*g*x^2)), x]
```

Maple [A]
time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a+b\,F^{\frac{c\sqrt{ex+d}}{\sqrt{gx+f}}}\right)^{2} \left(df+\left(dg+ef\right)x+eg\,x^{2}\right)}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^2/(d*f+(d*g+e*f)*x+e*g*x^2),x
)
```

```
[Out] int(1/(a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^2/(d*f+(d*g+e*f)*x+e*g*x^2),x
)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^2/(d*f+(d*g+e*f)*x+e*g*
x^2),x, algorithm="maxima")
```

```
[Out] 2*sqrt(g*x + f)/((e*f - d*g)*sqrt(e*x + d)*F^(sqrt(e*x + d)*c/sqrt(g*x + f)
)*a*b*c*log(F) + (e*f - d*g)*sqrt(e*x + d)*a^2*c*log(F)) + integrate((sqrt(
e*x + d)*c*log(F) + sqrt(g*x + f))/((a*b*c*e*g*x^2*log(F) + a*b*c*d*f*log(F
) + (e*f + d*g)*a*b*c*x*log(F))*sqrt(e*x + d)*F^(sqrt(e*x + d)*c/sqrt(g*x +
 f)) + (a^2*c*e*g*x^2*log(F) + a^2*c*d*f*log(F) + (e*f + d*g)*a^2*c*x*log(F
))*sqrt(e*x + d)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^2/(d*f+(d*g+e*f)*x+e*g*
x^2),x, algorithm="fricas")
```

[Out] integral(1/(a^2*d*g*x + a^2*d*f + (b^2*d*g*x + b^2*d*f + (b^2*g*x^2 + b^2*f*x)*e)*F^(2*sqrt(x*e + d)*c/sqrt(g*x + f)) + 2*(a*b*d*g*x + a*b*d*f + (a*b*g*x^2 + a*b*f*x)*e)*F^(sqrt(x*e + d)*c/sqrt(g*x + f)) + (a^2*g*x^2 + a^2*f*x)*e), x)

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(d+ex)(f+gx)\left(F^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}b+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a+b*F**(c*(e*x+d)**(1/2)/(g*x+f)**(1/2)))**2/(d*f+(d*g+e*f)*x+e*g*x**2),x)

[Out] Integral(1/((d + e*x)*(f + g*x)*(F**(c*sqrt(d + e*x)/sqrt(f + g*x))*b + a)**2), x)

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^2/(d*f+(d*g+e*f)*x+e*g*x^2),x, algorithm="giac")

[Out] integrate(1/((g*x^2*e + d*f + (d*g + f*e)*x)*(F^(sqrt(x*e + d)*c/sqrt(g*x + f))*b + a)^2), x)

Mupad [A]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{\left(a+F^{\frac{c\,\sqrt{d+e\,x}}{\sqrt{f+g\,x}}}\,b\right)^2\,\left(e\,g\,x^2+\left(d\,g+e\,f\right)\,x+d\,f\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/((a + F^((c*(d + e*x)^(1/2))/(f + g*x)^(1/2))*b)^2*(d*f + x*(d*g + e*f) + e*g*x^2)),x)

[Out] int(1/((a + F^((c*(d + e*x)^(1/2))/(f + g*x)^(1/2))*b)^2*(d*f + x*(d*g + e*f) + e*g*x^2)), x)

3.550 $\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^n}{d^2-e^2x^2}\,dx$

Optimal. Leaf size=50

$$\text{Int}\left(\frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^n}{d^2-e^2x^2},x\right)$$

```
[Out] Unintegrable((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^n/(-e^2*x^2+d^2),
x)
```

Rubi [A]
time = 0.15, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^n}{d^2-e^2x^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^n/(d^2 - e^2*x^2),x]
```

```
[Out] Defer[Int][(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^n/(d^2 - e^2*x^2
), x]
```

Rubi steps

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^n}{d^2-e^2x^2}\,dx = \int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^n}{d^2-e^2x^2}\,dx$$

Mathematica [A]
time = 0.49, size = 0, normalized size = 0.00

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^n}{d^2-e^2x^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^n/(d^2 - e^2*x^2)
,x]
```

```
[Out] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^n/(d^2 - e^2*x^2)
, x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\,F^{\frac{c\sqrt{e x+d}}{\sqrt{-e f x+d f}}}\right)^{n}}{-e^{2} x^{2}+d^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^n/(-e^2*x^2+d^2),x)
```

```
[Out] int((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^n/(-e^2*x^2+d^2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^n/(-e^2*x^2+d^2),x,
algorithm="maxima")
```

```
[Out] -integrate((F^(sqrt(e*x + d)*c/sqrt(-e*f*x + d*f))*b + a)^n/(e^2*x^2 - d^2)
, x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^n/(-e^2*x^2+d^2),x,
algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   alglo
gextint: unimplemented
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{\left(F^{\frac{c\sqrt{d+e x}}{\sqrt{d f-e f x}}} b+a\right)^{n}}{-d^{2}+e^{2} x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F**(c*(e*x+d)**(1/2)/(-e*f*x+d*f)**(1/2)))**n/(-e**2*x**2+d*
*2),x)
```

```
[Out] -Integral((F**(c*sqrt(d + e*x)/sqrt(d*f - e*f*x))*b + a)**n/(-d**2 + e**2*x
**2), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^n/(-e^2*x^2+d^2),x,
algorithm="giac")
```

```
[Out] integrate(-(F^(sqrt(x*e + d)*c/sqrt(-f*x*e + d*f))*b + a)^n/(x^2*e^2 - d^2)
, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{{\left(a+b\,{\mathrm{e}}^{\frac{c\,\ln\left(F\right)\,\sqrt{d+e\,x}}{\sqrt{d\,f-e\,f\,x}}}\right)}^n}{d^2-e^2\,x^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + F^((c*(d + e*x)^(1/2))/(d*f - e*f*x)^(1/2))*b)^n/(d^2 - e^2*x^2),x
)
```

```
[Out] int((a + b*exp((c*log(F)*(d + e*x)^(1/2))/(d*f - e*f*x)^(1/2)))^n/(d^2 - e^
2*x^2), x)
```

3.551 $\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^3}{d^2-e^2x^2}\,dx$

Optimal. Leaf size=152

$$\frac{3a^2b\operatorname{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}+\frac{3ab^2\operatorname{Ei}\left(\frac{2c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}+\frac{b^3\operatorname{Ei}\left(\frac{3c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}+\frac{a^3\log\left(\frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}$$

```
[Out] 3*a^2*b*Ei(c*ln(F)*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2))/d/e+3*a*b^2*Ei(2*c*ln(
F)*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2))/d/e+b^3*Ei(3*c*ln(F)*(e*x+d)^(1/2)/(-e
*f*x+d*f)^(1/2))/d/e+a^3*ln((e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2))/d/e
```

Rubi [A]
time = 0.23, antiderivative size = 152, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 47, $\frac{\text{number of rules}}{\text{integrand size}} = 0.064$, Rules used = {2329, 2214, 2209}

$$\frac{a^3\log\left(\frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}+\frac{3a^2b\operatorname{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}+\frac{3ab^2\operatorname{Ei}\left(\frac{2c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}+\frac{b^3\operatorname{Ei}\left(\frac{3c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^3/(d^2 - e^2*x^2),x]
```

```
[Out] (3*a^2*b*ExpIntegralEi[(c*Sqrt[d + e*x]*Log[F])/Sqrt[d*f - e*f*x]])/(d*e) +
 (3*a*b^2*ExpIntegralEi[(2*c*Sqrt[d + e*x]*Log[F])/Sqrt[d*f - e*f*x]])/(d*e
) + (b^3*ExpIntegralEi[(3*c*Sqrt[d + e*x]*Log[F])/Sqrt[d*f - e*f*x]])/(d*e)
 + (a^3*Log[Sqrt[d + e*x]/Sqrt[d*f - e*f*x]])/(d*e)
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2214

```
Int[((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) +
 (d_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*(F
^(g*(e + f*x)))^n)^p, x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m, n}, x] &&
 IGtQ[p, 0]
```

Rule 2329

```
Int[((a_.) + (b_.)*(F_)^(((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.
)*(x_)]))^(n_.)/((A_) + (C_.)*(x_)^2), x_Symbol] :> Dist[2*e*(g/(C*(e*f - d
*g))), Subst[Int[(a + b*F^(c*x))^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]],
x] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] &&
EqQ[e*f + d*g, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^3}{d^2-e^2x^2}\,dx = \frac{\text{Subst}\left(\int \frac{(a+bF^{cx})^3}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{a^3}{x}+\frac{3a^2bF^{cx}}{x}+\frac{3ab^2F^{2cx}}{x}+\frac{b^3F^{3cx}}{x}\right)dx, x, \frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}$$
$$= \frac{a^3\log\left(\frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de} + \frac{(3a^2b)\,\text{Subst}\left(\int \frac{F^{cx}}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de} + \frac{(3ab^2)\,\text{Su}}{}$$
$$= \frac{3a^2b\,\text{Ei}\left(\frac{c\sqrt{d+ex}\,\log(F)}{\sqrt{df-efx}}\right)}{de} + \frac{3ab^2\text{Ei}\left(\frac{2c\sqrt{d+ex}\,\log(F)}{\sqrt{df-efx}}\right)}{de} + \frac{b^3\text{Ei}\left(\frac{3c\sqrt{d+ex}\,\log}{\sqrt{df-efx}}\right)}{de}$$

Mathematica [F]
time = 0.89, size = 0, normalized size = 0.00

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^3}{d^2-e^2x^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^3/(d^2 - e^2*x^2)
,x]
```

```
[Out] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^3/(d^2 - e^2*x^2)
, x]
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\,F^{\frac{c\sqrt{ex+d}}{\sqrt{-efx+df}}}\right)^3}{-e^2x^2+d^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^3/(-e^2*x^2+d^2),x)
```

```
[Out] int((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^3/(-e^2*x^2+d^2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^3/(-e^2*x^2+d^2),x,
algorithm="maxima")
```

```
[Out] 1/2*a^3*(log(e*x + d)/(d*e) - log(e*x - d)/(d*e)) - b^3*integrate(F^(3*sqrt
(e*x + d)*c/(sqrt(-e*x + d)*sqrt(f)))/(e^2*x^2 - d^2), x) - 3*a*b^2*integra
te(F^(2*sqrt(e*x + d)*c/(sqrt(-e*x + d)*sqrt(f)))/(e^2*x^2 - d^2), x) - 3*a
^2*b*integrate(F^(sqrt(e*x + d)*c/(sqrt(-e*x + d)*sqrt(f)))/(e^2*x^2 - d^2)
, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^3/(-e^2*x^2+d^2),x,
algorithm="fricas")
```

```
[Out] integral(-(a^3 + 3*a^2*b/F^(sqrt(-f*x*e + d*f)*sqrt(x*e + d)*c/(f*x*e - d*f
)) + 3*a*b^2/F^(2*sqrt(-f*x*e + d*f)*sqrt(x*e + d)*c/(f*x*e - d*f)) + b^3/F
^(3*sqrt(-f*x*e + d*f)*sqrt(x*e + d)*c/(f*x*e - d*f)))/(x^2*e^2 - d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{a^{3}}{-d^{2}+e^{2}x^{2}}\,dx-\int \frac{F^{\frac{3c\sqrt{d+ex}}{\sqrt{df-efx}}}b^{3}}{-d^{2}+e^{2}x^{2}}\,dx-\int \frac{3F^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}a^{2}b}{-d^{2}+e^{2}x^{2}}\,dx-\int \frac{3F^{\frac{2c\sqrt{d+ex}}{\sqrt{df-efx}}}ab^{2}}{-d^{2}+e^{2}x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F**(c*(e*x+d)**(1/2)/(-e*f*x+d*f)**(1/2)))**3/(-e**2*x**2+d*
*2),x)
```

```
[Out] -Integral(a**3/(-d**2 + e**2*x**2), x) - Integral(F**(3*c*sqrt(d + e*x)/sqr
t(d*f - e*f*x))*b**3/(-d**2 + e**2*x**2), x) - Integral(3*F**(c*sqrt(d + e*
```

```
x)/sqrt(d*f - e*f*x))*a**2*b/(-d**2 + e**2*x**2), x) - Integral(3*F**(2*c*s
qrt(d + e*x)/sqrt(d*f - e*f*x))*a*b**2/(-d**2 + e**2*x**2), x)
```

Giac [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^3/(-e^2*x^2+d^2),x,
algorithm="giac")
```

```
[Out] Timed out
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(a+b\,{\mathrm{e}}^{\frac{c\,\ln\left(F\right)\,\sqrt{d+e\,x}}{\sqrt{d\,f-e\,f\,x}}}\right)}^3}{d^2-e^2\,x^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + F^((c*(d + e*x)^(1/2))/(d*f - e*f*x)^(1/2))*b)^3/(d^2 - e^2*x^2),x
)
```

```
[Out] int((a + b*exp((c*log(F)*(d + e*x)^(1/2))/(d*f - e*f*x)^(1/2)))^3/(d^2 - e^
2*x^2), x)
```

3.552 $\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^2}{d^2-e^2x^2}\,dx$

Optimal. Leaf size=110

$$\frac{2ab\mathrm{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}+\frac{b^2\mathrm{Ei}\left(\frac{2c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}+\frac{a^2\log\left(\frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}$$

```
[Out] 2*a*b*Ei(c*ln(F)*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2))/d/e+b^2*Ei(2*c*ln(F)*(e*
x+d)^(1/2)/(-e*f*x+d*f)^(1/2))/d/e+a^2*ln((e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2))
/d/e
```

Rubi [A]
time = 0.20, antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 47, $\frac{\text{number of rules}}{\text{integrand size}} = 0.064$, Rules used = {2329, 2214, 2209}

$$\frac{a^2\log\left(\frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}+\frac{2ab\mathrm{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}+\frac{b^2\mathrm{Ei}\left(\frac{2c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^2/(d^2 - e^2*x^2),x]
```

```
[Out] (2*a*b*ExpIntegralEi[(c*Sqrt[d + e*x]*Log[F])/Sqrt[d*f - e*f*x]])/(d*e) + (
b^2*ExpIntegralEi[(2*c*Sqrt[d + e*x]*Log[F])/Sqrt[d*f - e*f*x]])/(d*e) + (a
^2*Log[Sqrt[d + e*x]/Sqrt[d*f - e*f*x]])/(d*e)
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2214

```
Int[((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) +
 (d_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*(F
^(g*(e + f*x)))^n)^p, x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m, n}, x] &&
 IGtQ[p, 0]
```

Rule 2329

```
Int[((a_.) + (b_.)*(F_)^(((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.
)*(x_)]))^(n_.)/((A_) + (C_.)*(x_)^2), x_Symbol] :> Dist[2*e*(g/(C*(e*f - d
*g))), Subst[Int[(a + b*F^(c*x))^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]],
x] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] &&
EqQ[e*f + d*g, 0] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^2}{d^2-e^2x^2}\,dx &= \frac{\text{Subst}\left(\int \frac{(a+bF^{cx})^2}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}\\
&= \frac{\text{Subst}\left(\int \left(\frac{a^2}{x}+\frac{2abF^{cx}}{x}+\frac{b^2F^{2cx}}{x}\right)\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}\\
&= \frac{a^2\log\left(\frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}+\frac{(2ab)\text{Subst}\left(\int \frac{F^{cx}}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}+\frac{b^2\text{Subst}\left(\int\right.}{}\\
&= \frac{2ab\text{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}+\frac{b^2\text{Ei}\left(\frac{2c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}+\frac{a^2\log\left(\frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}\end{aligned}$$

Mathematica [F]
time = 0.85, size = 0, normalized size = 0.00

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^2}{d^2-e^2x^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^2/(d^2 - e^2*x^2)
,x]
```

```
[Out] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^2/(d^2 - e^2*x^2)
, x]
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\,F^{\frac{c\sqrt{ex+d}}{\sqrt{-efx+df}}}\right)^2}{-e^2x^2+d^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^2/(-e^2*x^2+d^2),x)
```

```
[Out] int((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^2/(-e^2*x^2+d^2),x)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^2/(-e^2*x^2+d^2),x,
algorithm="maxima")
```

```
[Out] 1/2*a^2*(log(e*x + d)/(d*e) - log(e*x - d)/(d*e)) - b^2*integrate(F^(2*sqrt
(e*x + d)*c/(sqrt(-e*x + d)*sqrt(f)))/(e^2*x^2 - d^2), x) - 2*a*b*integrate
(F^(sqrt(e*x + d)*c/(sqrt(-e*x + d)*sqrt(f)))/(e^2*x^2 - d^2), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^2/(-e^2*x^2+d^2),x,
algorithm="fricas")
```

```
[Out] integral(-(a^2 + 2*a*b/F^(sqrt(-f*x*e + d*f)*sqrt(x*e + d)*c/(f*x*e - d*f))
 + b^2/F^(2*sqrt(-f*x*e + d*f)*sqrt(x*e + d)*c/(f*x*e - d*f)))/(x^2*e^2 - d
^2), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{a^2}{-d^2+e^2x^2}\,dx-\int \frac{F^{\frac{2c\sqrt{d+ex}}{\sqrt{df-efx}}}b^2}{-d^2+e^2x^2}\,dx-\int \frac{2F^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}ab}{-d^2+e^2x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F**(c*(e*x+d)**(1/2)/(-e*f*x+d*f)**(1/2)))**2/(-e**2*x**2+d*
*2),x)
```

```
[Out] -Integral(a**2/(-d**2 + e**2*x**2), x) - Integral(F**(2*c*sqrt(d + e*x)/sqr
t(d*f - e*f*x))*b**2/(-d**2 + e**2*x**2), x) - Integral(2*F**(c*sqrt(d + e*
x)/sqrt(d*f - e*f*x))*a*b/(-d**2 + e**2*x**2), x)
```

Giac [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^2/(-e^2*x^2+d^2),x, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\,\mathrm{e}^{\frac{c\,\ln(F)\,\sqrt{d+e\,x}}{\sqrt{d\,f-e\,f\,x}}}\right)^2}{d^2-e^2\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + F^((c*(d + e*x)^(1/2))/(d*f - e*f*x)^(1/2))*b)^2/(d^2 - e^2*x^2),x)
```

```
[Out] int((a + b*exp((c*log(F)*(d + e*x)^(1/2))/(d*f - e*f*x)^(1/2)))^2/(d^2 - e^2*x^2), x)
```

3.553 $\int \frac{a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}}{d^2-e^2x^2}\,dx$

Optimal. Leaf size=68

$$\frac{b\text{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}+\frac{a\log\left(\frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}$$

```
[Out] b*Ei(c*ln(F)*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2))/d/e+a*ln((e*x+d)^(1/2)/(-e*f
*x+d*f)^(1/2))/d/e
```

Rubi [A]
time = 0.12, antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {2329, 14, 2209}

$$\frac{a\log\left(\frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}+\frac{b\text{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))/(d^2 - e^2*x^2),x]
```

```
[Out] (b*ExpIntegralEi[(c*Sqrt[d + e*x]*Log[F])/Sqrt[d*f - e*f*x]])/(d*e) + (a*Lo
g[Sqrt[d + e*x]/Sqrt[d*f - e*f*x]])/(d*e)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2329

```
Int[((a_.) + (b_.)*(F_)^(((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.
)*(x_)]))^(n_.)/((A_) + (C_.)*(x_)^2), x_Symbol] :> Dist[2*e*(g/(C*(e*f - d
*g))), Subst[Int[(a + b*F^(c*x))^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]],
x] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] &&
EqQ[e*f + d*g, 0] && IGtQ[n, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}}{d^2-e^2x^2}\,dx &= \frac{\text{Subst}\left(\int \frac{a+bF^{cx}}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}\\
&= \frac{\text{Subst}\left(\int \left(\frac{a}{x}+\frac{bF^{cx}}{x}\right)\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}\\
&= \frac{a\log\left(\frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}+\frac{b\text{Subst}\left(\int \frac{F^{cx}}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}\\
&= \frac{b\text{Ei}\left(\frac{c\sqrt{d+ex}\,\log(F)}{\sqrt{df-efx}}\right)}{de}+\frac{a\log\left(\frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}
\end{aligned}
$$

Mathematica [**F**]
time = 0.30, size = 0, normalized size = 0.00

$$\int \frac{a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}}{d^2-e^2x^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))/(d^2 - e^2*x^2),x
]
[Out] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))/(d^2 - e^2*x^2),
x]
```

Maple [**F**]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{a+b\,F^{\frac{c\sqrt{ex+d}}{\sqrt{-efx+df}}}}{-e^2x^2+d^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))/(-e^2*x^2+d^2),x)
[Out] int((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))/(-e^2*x^2+d^2),x)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))/(-e^2*x^2+d^2),x, al
gorithm="maxima")
```

```
[Out] 1/2*a*(log(e*x + d)/(d*e) - log(e*x - d)/(d*e)) - b*integrate(F^(sqrt(e*x +
 d)*c/(sqrt(-e*x + d)*sqrt(f)))/(e^2*x^2 - d^2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))/(-e^2*x^2+d^2),x, al
gorithm="fricas")
```

```
[Out] integral(-(a + b/F^(sqrt(-f*x*e + d*f)*sqrt(x*e + d)*c/(f*x*e - d*f)))/(x^2
*e^2 - d^2), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$- \int \frac{a}{-d^{2} + e^{2} x^{2}}\, dx - \int \frac{F^{\frac{c \sqrt{d + e x}}{\sqrt{d f - e f x}}} b}{-d^{2} + e^{2} x^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F**(c*(e*x+d)**(1/2)/(-e*f*x+d*f)**(1/2)))/(-e**2*x**2+d**2)
,x)
```

```
[Out] -Integral(a/(-d**2 + e**2*x**2), x) - Integral(F**(c*sqrt(d + e*x)/sqrt(d*f
 - e*f*x))*b/(-d**2 + e**2*x**2), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))/(-e^2*x^2+d^2),x, al
gorithm="giac")
```

```
[Out] integrate(-(F^(sqrt(x*e + d)*c/sqrt(-f*x*e + d*f))*b + a)/(x^2*e^2 - d^2),
x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{e}^{\frac{c\,\ln(F)\,\sqrt{d+e\,x}}{\sqrt{d\,f-e\,f\,x}}}}{d^2-e^2\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + F^((c*(d + e*x)^(1/2))/(d*f - e*f*x)^(1/2))*b)/(d^2 - e^2*x^2),x)
[Out] int((a + b*exp((c*log(F)*(d + e*x)^(1/2))/(d*f - e*f*x)^(1/2)))/(d^2 - e^2*
x^2), x)
```

3.554 $\int \frac{1}{d^2-e^2x^2}\,dx$

Optimal. Leaf size=14

$$\frac{\tanh^{-1}\left(\frac{ex}{d}\right)}{de}$$

[Out] arctanh(e*x/d)/d/e

Rubi [A]
time = 0.00, antiderivative size = 14, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.071$, Rules used = {214}

$$\frac{\tanh^{-1}\left(\frac{ex}{d}\right)}{de}$$

Antiderivative was successfully verified.

[In] Int[(d^2 - e^2*x^2)^(-1),x]

[Out] ArcTanh[(e*x)/d]/(d*e)

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{1}{d^2-e^2x^2}\,dx = \frac{\tanh^{-1}\left(\frac{ex}{d}\right)}{de}$$

Mathematica [A]
time = 0.00, size = 14, normalized size = 1.00

$$\frac{\tanh^{-1}\left(\frac{ex}{d}\right)}{de}$$

Antiderivative was successfully verified.

[In] Integrate[(d^2 - e^2*x^2)^(-1),x]

[Out] ArcTanh[(e*x)/d]/(d*e)

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 30 vs. 2(14) = 28.
time = 0.07, size = 31, normalized size = 2.21

method	result	size
default	$\frac{\ln(ex+d)}{2de}-\frac{\ln(-ex+d)}{2de}$	31
norman	$\frac{\ln(ex+d)}{2de}-\frac{\ln(-ex+d)}{2de}$	31
risch	$\frac{\ln(ex+d)}{2de}-\frac{\ln(-ex+d)}{2de}$	31

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-e^2*x^2+d^2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2/d/e*ln(e*x+d)-1/2/d/e*ln(-e*x+d)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 31 vs. $2(14) = 28$.
time = 0.30, size = 31, normalized size = 2.21

$$\frac{\log(ex+d)}{2\,de}-\frac{\log(ex-d)}{2\,de}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-e^2*x^2+d^2),x, algorithm="maxima")
```

```
[Out] 1/2*log(e*x + d)/(d*e) - 1/2*log(e*x - d)/(d*e)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 39 vs. $2(14) = 28$.
time = 0.41, size = 39, normalized size = 2.79

$$\frac{e^{(-1)}\log\left(\frac{x^2e^2+2\,dxe+d^2}{x^2e^2-d^2}\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-e^2*x^2+d^2),x, algorithm="fricas")
```

```
[Out] 1/2*e^(-1)*log((x^2*e^2 + 2*d*x*e + d^2)/(x^2*e^2 - d^2))/d
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 20 vs. $2(8) = 16$.
time = 0.05, size = 20, normalized size = 1.43

$$-\frac{\frac{\log\left(-\frac{d}{e}+x\right)}{2}-\frac{\log\left(\frac{d}{e}+x\right)}{2}}{de}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-e**2*x**2+d**2),x)
```

```
[Out] -(log(-d/e + x)/2 - log(d/e + x)/2)/(d*e)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 38 vs. $2(14) = 28$.
time = 4.07, size = 38, normalized size = 2.71

$$-\frac{e^{(-1)} \log\left(\frac{|2\,xe^2 - 2\,|d|e|}{|2\,xe^2 + 2\,|d|e|}\right)}{2\,|d|}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-e^2*x^2+d^2),x, algorithm="giac")
```

```
[Out] -1/2*e^(-1)*log(abs(2*x*e^2 - 2*abs(d)*e)/abs(2*x*e^2 + 2*abs(d)*e))/abs(d)
```

Mupad [B]
time = 3.43, size = 14, normalized size = 1.00

$$\frac{\operatorname{atanh}\left(\frac{e\,x}{d}\right)}{d\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d^2 - e^2*x^2),x)
```

```
[Out] atanh((e*x)/d)/(d*e)
```

3.555 $\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)(d^2-e^2x^2)}\,dx$

Optimal. Leaf size=50

$$\text{Int}\left(\frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)(d^2-e^2x^2)},x\right)$$

```
[Out] Unintegrable(1/(a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))/(-e^2*x^2+d^2),
x)
```

Rubi [A]
time = 0.16, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)(d^2-e^2x^2)}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))*(d^2 - e^2*x^2)),x]
```

```
[Out] Defer[Int][1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))*(d^2 - e^2*x^
2)), x]
```

Rubi steps

$$\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)(d^2-e^2x^2)}\,dx = \int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)(d^2-e^2x^2)}\,dx$$

Mathematica [A]
time = 0.32, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)(d^2-e^2x^2)}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))*(d^2 - e^2*x^2
)),x]
```

```
[Out] Integrate[1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))*(d^2 - e^2*x^2
)), x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a+b\,F^{\frac{c\sqrt{ex+d}}{\sqrt{-efx+df}}}\right)\left(-e^{2}x^{2}+d^{2}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))/(-e^2*x^2+d^2),x)
```

```
[Out] int(1/(a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))/(-e^2*x^2+d^2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))/(-e^2*x^2+d^2),x,
algorithm="maxima")
```

```
[Out] -integrate(1/((e^2*x^2 - d^2)*(F^(sqrt(e*x + d)*c/sqrt(-e*f*x + d*f))*b + a
)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))/(-e^2*x^2+d^2),x,
algorithm="fricas")
```

```
[Out] integral(-1/(a*x^2*e^2 - a*d^2 + (b*x^2*e^2 - b*d^2)/F^(sqrt(-f*x*e + d*f)*
sqrt(x*e + d)*c/(f*x*e - d*f))), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{1}{-F^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}bd^{2}+F^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}be^{2}x^{2}-ad^{2}+ae^{2}x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F**(c*(e*x+d)**(1/2)/(-e*f*x+d*f)**(1/2)))/(-e**2*x**2+d**
2),x)
```

```
[Out] -Integral(1/(-F**(c*sqrt(d + e*x)/sqrt(d*f - e*f*x))*b*d**2 + F**(c*sqrt(d
+ e*x)/sqrt(d*f - e*f*x))*b*e**2*x**2 - a*d**2 + a*e**2*x**2), x)
```

Giac [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))/(-e^2*x^2+d^2),x,
algorithm="giac")
```

```
[Out] Timed out
```

Mupad [**A**]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{\left(d^2-e^2\,x^2\right)\,\left(a+b\,\mathrm{e}^{\frac{c\,\ln\left(F\right)\,\sqrt{d+e\,x}}{\sqrt{d\,f-e\,f\,x}}}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d^2 - e^2*x^2)*(a + F^((c*(d + e*x)^(1/2))/(d*f - e*f*x)^(1/2))*b))
,x)
```

```
[Out] int(1/((d^2 - e^2*x^2)*(a + b*exp((c*log(F)*(d + e*x)^(1/2))/(d*f - e*f*x)^
(1/2)))), x)
```

3.556 $\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^2 (d^2-e^2x^2)}\,dx$

Optimal. Leaf size=50

$$\text{Int}\left(\frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^2 (d^2-e^2x^2)},x\right)$$

```
[Out] Unintegrable(1/(a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^2/(-e^2*x^2+d^2
),x)
```

Rubi [A]
time = 0.15, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^2 (d^2-e^2x^2)}\,dx$$

Verification is not applicable to the result.

```
[In] Int[1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^2*(d^2 - e^2*x^2)),x
]
```

```
[Out] Defer[Int][1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^2*(d^2 - e^2*
x^2)), x]
```

Rubi steps

$$\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^2 (d^2-e^2x^2)}\,dx = \int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^2 (d^2-e^2x^2)}\,dx$$

Mathematica [A]
time = 0.94, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^2 (d^2-e^2x^2)}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^2*(d^2 - e^2*x
^2)),x]
```

```
[Out] Integrate[1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^2*(d^2 - e^2*x
^2)), x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a+b\,F^{\frac{c\sqrt{ex+d}}{\sqrt{-efx+df}}}\right)^{2}\left(-e^{2}x^{2}+d^{2}\right)}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^2/(-e^2*x^2+d^2),x)
```

```
[Out] int(1/(a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^2/(-e^2*x^2+d^2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^2/(-e^2*x^2+d^2),x
, algorithm="maxima")
```

```
[Out] sqrt(-e*x + d)*sqrt(f)/(sqrt(e*x + d)*F^(sqrt(e*x + d)*c/(sqrt(-e*x + d)*sq
rt(f)))*a*b*c*d*e*log(F) + sqrt(e*x + d)*a^2*c*d*e*log(F)) - integrate((sqr
t(e*x + d)*c*log(F) + sqrt(-e*x + d)*sqrt(f))/((a*b*c*e^2*x^2*log(F) - a*b*
c*d^2*log(F))*sqrt(e*x + d)*F^(sqrt(e*x + d)*c/(sqrt(-e*x + d)*sqrt(f))) +
(a^2*c*e^2*x^2*log(F) - a^2*c*d^2*log(F))*sqrt(e*x + d)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^2/(-e^2*x^2+d^2),x
, algorithm="fricas")
```

```
[Out] integral(-1/(a^2*x^2*e^2 - a^2*d^2 + 2*(a*b*x^2*e^2 - a*b*d^2)/F^(sqrt(-f*x
*e + d*f)*sqrt(x*e + d)*c/(f*x*e - d*f)) + (b^2*x^2*e^2 - b^2*d^2)/F^(2*sqr
t(-f*x*e + d*f)*sqrt(x*e + d)*c/(f*x*e - d*f))), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F**(c*(e*x+d)**(1/2)/(-e*f*x+d*f)**(1/2)))**2/(-e**2*x**2+
d**2),x)
```

```
[Out] Timed out
```

Giac [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^2/(-e^2*x^2+d^2),x
, algorithm="giac")
```

```
[Out] Timed out
```

Mupad [**A**]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{\left(d^2-e^2\,x^2\right)\,{\left(a+b\,{\mathrm{e}}^{\frac{c\,\ln\left(F\right)\,\sqrt{d+e\,x}}{\sqrt{d\,f-e\,f\,x}}}\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d^2 - e^2*x^2)*(a + F^((c*(d + e*x)^(1/2))/(d*f - e*f*x)^(1/2))*b)^
2),x)
```

```
[Out] int(1/((d^2 - e^2*x^2)*(a + b*exp((c*log(F)*(d + e*x)^(1/2))/(d*f - e*f*x)^
(1/2)))^2), x)
```

3.557 $\int \frac{\left(F^{\frac{\sqrt{1-ax}}{\sqrt{1+ax}}}\right)^n}{1-a^2x^2}\,dx$

Optimal. Leaf size=77

$$-\frac{F^{-\frac{n\sqrt{1-ax}}{\sqrt{1+ax}}}\left(F^{\frac{\sqrt{1-ax}}{\sqrt{1+ax}}}\right)^n \operatorname{Ei}\left(\frac{n\sqrt{1-ax}\,\log(F)}{\sqrt{1+ax}}\right)}{a}$$

[Out] -(F^((-a*x+1)^(1/2)/(a*x+1)^(1/2)))^n*Ei(n*ln(F)*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/a/(F^(n*(-a*x+1)^(1/2)/(a*x+1)^(1/2)))

Rubi [A]
time = 0.17, antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.081$, Rules used = {2319, 2329, 2209}

$$-\frac{F^{-\frac{n\sqrt{1-ax}}{\sqrt{ax+1}}}\left(F^{\frac{\sqrt{1-ax}}{\sqrt{ax+1}}}\right)^n \operatorname{Ei}\left(\frac{n\sqrt{1-ax}\,\log(F)}{\sqrt{ax+1}}\right)}{a}$$

Antiderivative was successfully verified.

[In] Int[(F^(Sqrt[1 - a*x]/Sqrt[1 + a*x]))^n/(1 - a^2*x^2),x]

[Out] -(((F^(Sqrt[1 - a*x]/Sqrt[1 + a*x]))^n*ExpIntegralEi[(n*Sqrt[1 - a*x]*Log[F])/Sqrt[1 + a*x]])/(a*F^((n*Sqrt[1 - a*x])/Sqrt[1 + a*x])))

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] && !TrueQ[$UseGamma]
```

Rule 2319

```
Int[(u_.)*((a_.)*(F_)^(v_))^(n_), x_Symbol] :> Dist[(a*F^v)^n/F^(n*v), Int[
u*F^(n*v), x], x] /; FreeQ[{F, a, n}, x] && !IntegerQ[n]
```

Rule 2329

```
Int[((a_.) + (b_.)*(F_)^(((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.
)*(x_)]))^(n_.)/((A_) + (C_.)*(x_)^2), x_Symbol] :> Dist[2*e*(g/(C*(e*f - d
*g))), Subst[Int[(a + b*F^(c*x))^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]],
```

```
x] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] &&
EqQ[e*f + d*g, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(F^{\frac{\sqrt{1-ax}}{\sqrt{1+ax}}}\right)^n}{1-a^2x^2}\,dx = \left(F^{-\frac{n\sqrt{1-ax}}{\sqrt{1+ax}}}\left(F^{\frac{\sqrt{1-ax}}{\sqrt{1+ax}}}\right)^n\right)\int \frac{F^{\frac{n\sqrt{1-ax}}{\sqrt{1+ax}}}}{1-a^2x^2}\,dx$$
$$= -\frac{\left(F^{-\frac{n\sqrt{1-ax}}{\sqrt{1+ax}}}\left(F^{\frac{\sqrt{1-ax}}{\sqrt{1+ax}}}\right)^n\right)\text{Subst}\left(\int \frac{F^{nx}}{x}\,dx, x, \frac{\sqrt{1-ax}}{\sqrt{1+ax}}\right)}{a}$$
$$= -\frac{F^{-\frac{n\sqrt{1-ax}}{\sqrt{1+ax}}}\left(F^{\frac{\sqrt{1-ax}}{\sqrt{1+ax}}}\right)^n \text{Ei}\left(\frac{n\sqrt{1-ax}\,\log(F)}{\sqrt{1+ax}}\right)}{a}$$

Mathematica [A]
time = 0.20, size = 77, normalized size = 1.00

$$-\frac{F^{-\frac{n\sqrt{1-ax}}{\sqrt{1+ax}}}\left(F^{\frac{\sqrt{1-ax}}{\sqrt{1+ax}}}\right)^n \text{Ei}\left(\frac{n\sqrt{1-ax}\,\log(F)}{\sqrt{1+ax}}\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(F^(Sqrt[1 - a*x]/Sqrt[1 + a*x]))^n/(1 - a^2*x^2),x]
```

```
[Out] -(((F^(Sqrt[1 - a*x]/Sqrt[1 + a*x]))^n*ExpIntegralEi[(n*Sqrt[1 - a*x]*Log[F
])/Sqrt[1 + a*x]])/(a*F^((n*Sqrt[1 - a*x])/Sqrt[1 + a*x])))
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{\left(F^{\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}}\right)^n}{-a^2x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((F^((-a*x+1)^(1/2)/(a*x+1)^(1/2)))^n/(-a^2*x^2+1),x)
```

```
[Out] int((F^((-a*x+1)^(1/2)/(a*x+1)^(1/2)))^n/(-a^2*x^2+1),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((F^((-a*x+1)^(1/2)/(a*x+1)^(1/2)))^n/(-a^2*x^2+1),x, algorithm="m
axima")
```

```
[Out] -integrate(F^(sqrt(-a*x + 1)*n/sqrt(a*x + 1))/(a^2*x^2 - 1), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((F^((-a*x+1)^(1/2)/(a*x+1)^(1/2)))^n/(-a^2*x^2+1),x, algorithm="f
ricas")
```

```
[Out] integral(-(F^(sqrt(-a*x + 1)/sqrt(a*x + 1)))^n/(a^2*x^2 - 1), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{\left(F^{\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}}\right)^{n}}{a^{2}x^{2}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((F**((-a*x+1)**(1/2)/(a*x+1)**(1/2)))**n/(-a**2*x**2+1),x)
```

```
[Out] -Integral((F**(sqrt(-a*x + 1)/sqrt(a*x + 1)))**n/(a**2*x**2 - 1), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((F^((-a*x+1)^(1/2)/(a*x+1)^(1/2)))^n/(-a^2*x^2+1),x, algorithm="g
iac")
```

```
[Out] integrate(-(F^(sqrt(-a*x + 1)/sqrt(a*x + 1)))^n/(a^2*x^2 - 1), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int -\frac{\left(F^{\frac{\sqrt{1-a\,x}}{\sqrt{a\,x+1}}}\right)^n}{a^2\,x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(F^((1 - a*x)^(1/2)/(a*x + 1)^(1/2)))^n/(a^2*x^2 - 1),x)
[Out] int(-(F^((1 - a*x)^(1/2)/(a*x + 1)^(1/2)))^n/(a^2*x^2 - 1), x)
```

3.558 $\int \frac{F^{\frac{3\sqrt{1-ax}}{\sqrt{1+ax}}}}{1-a^2x^2}\,dx$

Optimal. Leaf size=29

$$-\frac{\text{Ei}\left(\frac{3\sqrt{1-ax}\,\log(F)}{\sqrt{1+ax}}\right)}{a}$$

[Out] -Ei(3*ln(F)*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/a

Rubi [A]

time = 0.07, antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}} = 0.056$, Rules used = {2329, 2209}

$$-\frac{\text{Ei}\left(\frac{3\sqrt{1-ax}\,\log(F)}{\sqrt{ax+1}}\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Int[F^((3*Sqrt[1 - a*x])/Sqrt[1 + a*x])/(1 - a^2*x^2),x]
[Out] -(ExpIntegralEi[(3*Sqrt[1 - a*x]*Log[F])/Sqrt[1 + a*x]]/a)
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2329

```
Int[((a_.) + (b_.)*(F_)^(((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.
)*(x_)]))^(n_.)/((A_) + (C_.)*(x_)^2), x_Symbol] :> Dist[2*e*(g/(C*(e*f - d
*g))), Subst[Int[(a + b*F^(c*x))^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]],
x] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] &&
EqQ[e*f + d*g, 0] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{F^{\frac{3\sqrt{1-ax}}{\sqrt{1+ax}}}}{1-a^2x^2}\,dx &= -\frac{\text{Subst}\left(\int \frac{F^{3x}}{x}\,dx, x, \frac{\sqrt{1-ax}}{\sqrt{1+ax}}\right)}{a}\\ &= -\frac{\text{Ei}\left(\frac{3\sqrt{1-ax}\,\log(F)}{\sqrt{1+ax}}\right)}{a}\end{aligned}$$

Mathematica [A]
time = 0.16, size = 29, normalized size = 1.00

$$-\frac{\text{Ei}\left(\frac{3\sqrt{1-ax}\log(F)}{\sqrt{1+ax}}\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^((3*Sqrt[1 - a*x])/Sqrt[1 + a*x])/(1 - a^2*x^2),x]
[Out] -(ExpIntegralEi[(3*Sqrt[1 - a*x]*Log[F])/Sqrt[1 + a*x]]/a)
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{F^{\frac{3\sqrt{-ax+1}}{\sqrt{ax+1}}}}{-a^{2}x^{2}+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(3*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x)
[Out] int(F^(3*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(3*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x, algorithm="max
ima")
[Out] -integrate(F^(3*sqrt(-a*x + 1)/sqrt(a*x + 1))/(a^2*x^2 - 1), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(3*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x, algorithm="fri
cas")
[Out] integral(-F^(3*sqrt(-a*x + 1)/sqrt(a*x + 1))/(a^2*x^2 - 1), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{F^{\frac{3\sqrt{-ax+1}}{\sqrt{ax+1}}}}{a^2x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(3*(-a*x+1)**(1/2)/(a*x+1)**(1/2))/(-a**2*x**2+1),x)
```

```
[Out] -Integral(F**(3*sqrt(-a*x + 1)/sqrt(a*x + 1))/(a**2*x**2 - 1), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(3*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x, algorithm="gia
c")
```

```
[Out] integrate(-F^(3*sqrt(-a*x + 1)/sqrt(a*x + 1))/(a^2*x^2 - 1), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.03

$$\int -\frac{F^{\frac{3\,\sqrt{1-a\,x}}{\sqrt{a\,x+1}}}}{a^2\,x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-F^((3*(1 - a*x)^(1/2))/(a*x + 1)^(1/2))/(a^2*x^2 - 1),x)
```

```
[Out] int(-F^((3*(1 - a*x)^(1/2))/(a*x + 1)^(1/2))/(a^2*x^2 - 1), x)
```

3.559 $\int \frac{F^{\frac{2\sqrt{1-ax}}{\sqrt{1+ax}}}}{1-a^2x^2}\,dx$

Optimal. Leaf size=29

$$-\frac{\text{Ei}\left(\frac{2\sqrt{1-ax}\,\log(F)}{\sqrt{1+ax}}\right)}{a}$$

[Out] -Ei(2*ln(F)*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/a

Rubi [A]

time = 0.07, antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.056, Rules used = {2329, 2209}

$$-\frac{\text{Ei}\left(\frac{2\sqrt{1-ax}\,\log(F)}{\sqrt{ax+1}}\right)}{a}$$

Antiderivative was successfully verified.

[In] Int[F^((2*Sqrt[1 - a*x])/Sqrt[1 + a*x])/(1 - a^2*x^2),x]

[Out] -(ExpIntegralEi[(2*Sqrt[1 - a*x]*Log[F])/Sqrt[1 + a*x]]/a)

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2329

```
Int[((a_.) + (b_.)*(F_)^(((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.
)*(x_)]))^(n_.)/((A_) + (C_.)*(x_)^2), x_Symbol] :> Dist[2*e*(g/(C*(e*f - d
*g))), Subst[Int[(a + b*F^(c*x))^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]],
x] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] &&
EqQ[e*f + d*g, 0] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{F^{\frac{2\sqrt{1-ax}}{\sqrt{1+ax}}}}{1-a^2x^2}\,dx &= -\frac{\text{Subst}\left(\int \frac{F^{2x}}{x}\,dx, x, \frac{\sqrt{1-ax}}{\sqrt{1+ax}}\right)}{a}\\
&= -\frac{\text{Ei}\left(\frac{2\sqrt{1-ax}\,\log(F)}{\sqrt{1+ax}}\right)}{a}
\end{aligned}$$

Mathematica [A]
time = 0.16, size = 29, normalized size = 1.00

$$-\frac{\text{Ei}\left(\frac{2\sqrt{1-ax}\log(F)}{\sqrt{1+ax}}\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^((2*Sqrt[1 - a*x])/Sqrt[1 + a*x])/(1 - a^2*x^2),x]
[Out] -(ExpIntegralEi[(2*Sqrt[1 - a*x]*Log[F])/Sqrt[1 + a*x]]/a)
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{F^{\frac{2\sqrt{-ax+1}}{\sqrt{ax+1}}}}{-a^{2}x^{2}+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(2*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x)
[Out] int(F^(2*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(2*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x, algorithm="max
ima")
[Out] -integrate(F^(2*sqrt(-a*x + 1)/sqrt(a*x + 1))/(a^2*x^2 - 1), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(2*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x, algorithm="fri
cas")
[Out] integral(-F^(2*sqrt(-a*x + 1)/sqrt(a*x + 1))/(a^2*x^2 - 1), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{F^{\frac{2\sqrt{-ax+1}}{\sqrt{ax+1}}}}{a^2x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(2*(-a*x+1)**(1/2)/(a*x+1)**(1/2))/(-a**2*x**2+1),x)
[Out] -Integral(F**(2*sqrt(-a*x + 1)/sqrt(a*x + 1))/(a**2*x**2 - 1), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(2*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x, algorithm="gia
c")
[Out] integrate(-F^(2*sqrt(-a*x + 1)/sqrt(a*x + 1))/(a^2*x^2 - 1), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.03

$$\int -\frac{F^{\frac{2\sqrt{1-a\,x}}{\sqrt{a\,x+1}}}}{a^2\,x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-F^((2*(1 - a*x)^(1/2))/(a*x + 1)^(1/2))/(a^2*x^2 - 1),x)
[Out] int(-F^((2*(1 - a*x)^(1/2))/(a*x + 1)^(1/2))/(a^2*x^2 - 1), x)
```

3.560 $\int \frac{F^{\frac{\sqrt{1-ax}}{\sqrt{1+ax}}}}{1-a^2x^2}\,dx$

Optimal. Leaf size=28

$$-\frac{\operatorname{Ei}\left(\frac{\sqrt{1-ax}\log(F)}{\sqrt{1+ax}}\right)}{a}$$

[Out] -Ei(ln(F)*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/a

Rubi [A]

time = 0.06, antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.057$, Rules used = {2329, 2209}

$$-\frac{\operatorname{Ei}\left(\frac{\sqrt{1-ax}\log(F)}{\sqrt{ax+1}}\right)}{a}$$

Antiderivative was successfully verified.

[In] Int[F^(Sqrt[1 - a*x]/Sqrt[1 + a*x])/(1 - a^2*x^2),x]

[Out] -(ExpIntegralEi[(Sqrt[1 - a*x]*Log[F])/Sqrt[1 + a*x]]/a)

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2329

```
Int[((a_.) + (b_.)*(F_)^(((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.
)*(x_)]))^(n_.)/((A_) + (C_.)*(x_)^2), x_Symbol] :> Dist[2*e*(g/(C*(e*f - d
*g))), Subst[Int[(a + b*F^(c*x))^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]],
x] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] &&
EqQ[e*f + d*g, 0] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{F^{\frac{\sqrt{1-ax}}{\sqrt{1+ax}}}}{1-a^2x^2}\,dx &= -\frac{\operatorname{Subst}\left(\int \frac{F^x}{x}\,dx, x, \frac{\sqrt{1-ax}}{\sqrt{1+ax}}\right)}{a}\\ &= -\frac{\operatorname{Ei}\left(\frac{\sqrt{1-ax}\log(F)}{\sqrt{1+ax}}\right)}{a}\end{aligned}$$

Mathematica [A]
time = 0.14, size = 28, normalized size = 1.00

$$-\frac{\mathrm{Ei}\left(\frac{\sqrt{1-ax}\,\log(F)}{\sqrt{1+ax}}\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(Sqrt[1 - a*x]/Sqrt[1 + a*x])/(1 - a^2*x^2),x]
[Out] -(ExpIntegralEi[(Sqrt[1 - a*x]*Log[F])/Sqrt[1 + a*x]]/a)
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{F^{\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}}}{-a^{2}x^{2}+1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x)
[Out] int(F^((-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^((-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x, algorithm="maxim
a")
[Out] -integrate(F^(sqrt(-a*x + 1)/sqrt(a*x + 1))/(a^2*x^2 - 1), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^((-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x, algorithm="frica
s")
[Out] integral(-F^(sqrt(-a*x + 1)/sqrt(a*x + 1))/(a^2*x^2 - 1), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{F^{\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}}}{a^2x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**((-a*x+1)**(1/2)/(a*x+1)**(1/2))/(-a**2*x**2+1),x)
```

```
[Out] -Integral(F**(sqrt(-a*x + 1)/sqrt(a*x + 1))/(a**2*x**2 - 1), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^((-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x, algorithm="giac"
)
```

```
[Out] integrate(-F^(sqrt(-a*x + 1)/sqrt(a*x + 1))/(a^2*x^2 - 1), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.04

$$\int -\frac{F^{\frac{\sqrt{1-a\,x}}{\sqrt{a\,x+1}}}}{a^2\,x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-F^((1 - a*x)^(1/2)/(a*x + 1)^(1/2))/(a^2*x^2 - 1),x)
```

```
[Out] int(-F^((1 - a*x)^(1/2)/(a*x + 1)^(1/2))/(a^2*x^2 - 1), x)
```

3.561 $\int \frac{F^{-\frac{\sqrt{1-ax}}{\sqrt{1+ax}}}}{1-a^2x^2}\,dx$

Optimal. Leaf size=29

$$-\frac{\operatorname{Ei}\left(-\frac{\sqrt{1-ax}\log(F)}{\sqrt{1+ax}}\right)}{a}$$

[Out] -Ei(-ln(F)*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/a

Rubi [A]

time = 0.07, antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}} = 0.056$, Rules used = {2329, 2209}

$$-\frac{\operatorname{Ei}\left(-\frac{\sqrt{1-ax}\log(F)}{\sqrt{ax+1}}\right)}{a}$$

Antiderivative was successfully verified.

[In] Int[1/(F^(Sqrt[1 - a*x]/Sqrt[1 + a*x])*(1 - a^2*x^2)),x]

[Out] -(ExpIntegralEi[-((Sqrt[1 - a*x]*Log[F])/Sqrt[1 + a*x])]/a)

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2329

```
Int[((a_.) + (b_.)*(F_)^(((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.
)*(x_)]))^(n_.)/((A_) + (C_.)*(x_)^2), x_Symbol] :> Dist[2*e*(g/(C*(e*f - d
*g))), Subst[Int[(a + b*F^(c*x))^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]],
x] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] &&
EqQ[e*f + d*g, 0] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{F^{-\frac{\sqrt{1-ax}}{\sqrt{1+ax}}}}{1-a^2x^2}\,dx &= -\frac{\operatorname{Subst}\left(\int \frac{F^{-x}}{x}\,dx, x, \frac{\sqrt{1-ax}}{\sqrt{1+ax}}\right)}{a}\\ &= -\frac{\operatorname{Ei}\left(-\frac{\sqrt{1-ax}\log(F)}{\sqrt{1+ax}}\right)}{a}\end{aligned}$$

Mathematica [A]
time = 0.15, size = 29, normalized size = 1.00

$$-\frac{\mathrm{Ei}\left(-\frac{\sqrt{1-ax}\log(F)}{\sqrt{1+ax}}\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(F^(Sqrt[1 - a*x]/Sqrt[1 + a*x])*(1 - a^2*x^2)),x]
```

```
[Out] -(ExpIntegralEi[-((Sqrt[1 - a*x]*Log[F])/Sqrt[1 + a*x])]/a)
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{F^{-\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}}}{-a^2x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(F^((-a*x+1)^(1/2)/(a*x+1)^(1/2)))/(-a^2*x^2+1),x)
```

```
[Out] int(1/(F^((-a*x+1)^(1/2)/(a*x+1)^(1/2)))/(-a^2*x^2+1),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(F^((-a*x+1)^(1/2)/(a*x+1)^(1/2)))/(-a^2*x^2+1),x, algorithm="m
axima")
```

```
[Out] -integrate(1/((a^2*x^2 - 1)*F^(sqrt(-a*x + 1)/sqrt(a*x + 1))), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(F^((-a*x+1)^(1/2)/(a*x+1)^(1/2)))/(-a^2*x^2+1),x, algorithm="f
ricas")
```

```
[Out] integral(-1/((a^2*x^2 - 1)*F^(sqrt(-a*x + 1)/sqrt(a*x + 1))), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{1}{F^{\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}}a^2x^2 - F^{\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(F**((-a*x+1)**(1/2)/(a*x+1)**(1/2)))/(-a**2*x**2+1),x)
```

```
[Out] -Integral(1/(F**(sqrt(-a*x + 1)/sqrt(a*x + 1))*a**2*x**2 - F**(sqrt(-a*x +
1)/sqrt(a*x + 1))), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(F^((-a*x+1)^(1/2)/(a*x+1)^(1/2)))/(-a^2*x^2+1),x, algorithm="g
iac")
```

```
[Out] integrate(-1/((a^2*x^2 - 1)*F^(sqrt(-a*x + 1)/sqrt(a*x + 1))), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.03

$$\int -\frac{1}{F^{\frac{\sqrt{1-a\,x}}{\sqrt{a\,x+1}}}\,\left(a^2\,x^2-1\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-1/(F^((1 - a*x)^(1/2)/(a*x + 1)^(1/2))*(a^2*x^2 - 1)),x)
```

```
[Out] int(-1/(F^((1 - a*x)^(1/2)/(a*x + 1)^(1/2))*(a^2*x^2 - 1)), x)
```

3.562 $\int \frac{F^{-\frac{2\sqrt{1-ax}}{\sqrt{1+ax}}}}{1-a^2x^2}\,dx$

Optimal. Leaf size=29

$$-\frac{\text{Ei}\left(-\frac{2\sqrt{1-ax}\,\log(F)}{\sqrt{1+ax}}\right)}{a}$$

```
[Out] -Ei(-2*ln(F)*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/a
```

Rubi [A]

time = 0.07, antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}} = 0.056$, Rules used = {2329, 2209}

$$-\frac{\text{Ei}\left(-\frac{2\sqrt{1-ax}\,\log(F)}{\sqrt{ax+1}}\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Int[1/(F^((2*Sqrt[1 - a*x])/Sqrt[1 + a*x])*(1 - a^2*x^2)),x]
```

```
[Out] -(ExpIntegralEi[(-2*Sqrt[1 - a*x]*Log[F])/Sqrt[1 + a*x]]/a)
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2329

```
Int[((a_.) + (b_.)*(F_)^(((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.
)*(x_)]))^(n_.)/((A_) + (C_.)*(x_)^2), x_Symbol] :> Dist[2*e*(g/(C*(e*f - d
*g))), Subst[Int[(a + b*F^(c*x))^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]],
x] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] &&
EqQ[e*f + d*g, 0] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{F^{-\frac{2\sqrt{1-ax}}{\sqrt{1+ax}}}}{1-a^2x^2}\,dx &= -\frac{\text{Subst}\left(\int \frac{F^{-2x}}{x}\,dx, x, \frac{\sqrt{1-ax}}{\sqrt{1+ax}}\right)}{a}\\
&= -\frac{\text{Ei}\left(-\frac{2\sqrt{1-ax}\,\log(F)}{\sqrt{1+ax}}\right)}{a}
\end{aligned}$$

Mathematica [A]
time = 0.16, size = 29, normalized size = 1.00

$$-\frac{\text{Ei}\left(-\frac{2\sqrt{1-ax}\log(F)}{\sqrt{1+ax}}\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(F^((2*Sqrt[1 - a*x])/Sqrt[1 + a*x])*(1 - a^2*x^2)),x]
[Out] -(ExpIntegralEi[(-2*Sqrt[1 - a*x]*Log[F])/Sqrt[1 + a*x]]/a)
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{F^{-\frac{2\sqrt{-ax+1}}{\sqrt{ax+1}}}}{-a^2x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(F^(2*(-a*x+1)^(1/2)/(a*x+1)^(1/2)))/(-a^2*x^2+1),x)
[Out] int(1/(F^(2*(-a*x+1)^(1/2)/(a*x+1)^(1/2)))/(-a^2*x^2+1),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(F^(2*(-a*x+1)^(1/2)/(a*x+1)^(1/2)))/(-a^2*x^2+1),x, algorithm=
"maxima")
[Out] -integrate(1/((a^2*x^2 - 1)*F^(2*sqrt(-a*x + 1)/sqrt(a*x + 1))), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(F^(2*(-a*x+1)^(1/2)/(a*x+1)^(1/2)))/(-a^2*x^2+1),x, algorithm=
"fricas")
[Out] integral(-1/((a^2*x^2 - 1)*F^(2*sqrt(-a*x + 1)/sqrt(a*x + 1))), x)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{1}{F^{\frac{2\sqrt{-ax+1}}{\sqrt{ax+1}}}a^2x^2 - F^{\frac{2\sqrt{-ax+1}}{\sqrt{ax+1}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(F**(2*(-a*x+1)**(1/2)/(a*x+1)**(1/2)))/(-a**2*x**2+1),x)
```

```
[Out] -Integral(1/(F**(2*sqrt(-a*x + 1)/sqrt(a*x + 1))*a**2*x**2 - F**(2*sqrt(-a*
x + 1)/sqrt(a*x + 1))), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(F^(2*(-a*x+1)^(1/2)/(a*x+1)^(1/2)))/(-a^2*x^2+1),x, algorithm=
"giac")
```

```
[Out] integrate(-1/((a^2*x^2 - 1)*F^(2*sqrt(-a*x + 1)/sqrt(a*x + 1))), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.03

$$\int -\frac{1}{F^{\frac{2\,\sqrt{1-a\,x}}{\sqrt{a\,x+1}}}\,\left(a^2\,x^2-1\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-1/(F^((2*(1 - a*x)^(1/2))/(a*x + 1)^(1/2))*(a^2*x^2 - 1)),x)
```

```
[Out] int(-1/(F^((2*(1 - a*x)^(1/2))/(a*x + 1)^(1/2))*(a^2*x^2 - 1)), x)
```

3.563 $\int a^x b^x x^2 \, dx$

Optimal. Leaf size=49

$$\frac{2a^x b^x}{(\log(a)+\log(b))^3} - \frac{2a^x b^x x}{(\log(a)+\log(b))^2} + \frac{a^x b^x x^2}{\log(a)+\log(b)}$$

```
[Out] 2*a^x*b^x/(ln(a)+ln(b))^3-2*a^x*b^x*x/(ln(a)+ln(b))^2+a^x*b^x*x^2/(ln(a)+ln
(b))
```

Rubi [A]
time = 0.05, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.300$, Rules used = {2325, 2207, 2225}

$$\frac{x^2 a^x b^x}{\log(a)+\log(b)} - \frac{2x a^x b^x}{(\log(a)+\log(b))^2} + \frac{2a^x b^x}{(\log(a)+\log(b))^3}$$

Antiderivative was successfully verified.

```
[In] Int[a^x*b^x*x^2,x]
```

```
[Out] (2*a^x*b^x)/(Log[a] + Log[b])^3 - (2*a^x*b^x*x)/(Log[a] + Log[b])^2 + (a^x*
b^x*x^2)/(Log[a] + Log[b])
```

Rule 2207

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[(c + d*x)^m*((b*F^(g*(e + f*x)))^n/(f*g*n*Log[F])),
x] - Dist[d*(m/(f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !TrueQ[$UseGamma]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2325

```
Int[(u_.)*(F_)^(v_)*(G_)^(w_), x_Symbol] :> With[{z = v*Log[F] + w*Log[G]},
 Int[u*NormalizeIntegrand[E^z, x], x] /; BinomialQ[z, x] || (PolynomialQ[z,
 x] && LeQ[Exponent[z, x], 2])] /; FreeQ[{F, G}, x]
```

Rubi steps

$$
\begin{aligned}
\int a^x b^x x^2\,dx &= \int e^{x(\log(a)+\log(b))}x^2\,dx \\
&= \frac{a^x b^x x^2}{\log(a)+\log(b)} - \frac{2\int e^{x(\log(a)+\log(b))}x\,dx}{\log(a)+\log(b)} \\
&= -\frac{2a^x b^x x}{(\log(a)+\log(b))^2} + \frac{a^x b^x x^2}{\log(a)+\log(b)} + \frac{2\int e^{x(\log(a)+\log(b))}\,dx}{(\log(a)+\log(b))^2} \\
&= \frac{2a^x b^x}{(\log(a)+\log(b))^3} - \frac{2a^x b^x x}{(\log(a)+\log(b))^2} + \frac{a^x b^x x^2}{\log(a)+\log(b)}
\end{aligned}
$$

Mathematica [A]
time = 0.03, size = 35, normalized size = 0.71

$$
\frac{a^x b^x (2 - 2x(\log(a)+\log(b)) + x^2(\log(a)+\log(b))^2)}{(\log(a)+\log(b))^3}
$$

Antiderivative was successfully verified.

```
[In] Integrate[a^x*b^x*x^2,x]
```

```
[Out] (a^x*b^x*(2 - 2*x*(Log[a] + Log[b]) + x^2*(Log[a] + Log[b])^2))/(Log[a] + L
og[b])^3
```

Maple [A]
time = 0.03, size = 52, normalized size = 1.06

method	result	size
risch	$\frac{\left(\ln(b)^2 x^2+2\ln(b)\ln(a)x^2+\ln(a)^2 x^2-2\ln(b)x-2\ln(a)x+2\right)a^x b^x}{(\ln(a)+\ln(b))^3}$	52
gosper	$\frac{\left(\ln(b)^2 x^2+2\ln(b)\ln(a)x^2+\ln(a)^2 x^2-2\ln(b)x-2\ln(a)x+2\right)a^x b^x}{(\ln(a)+\ln(b))\left(\ln(b)^2+2\ln(b)\ln(a)+\ln(a)^2\right)}$	69
meijerg	$-\frac{2-\frac{\left(3x^2\ln(b)^2\left(1+\frac{\ln(a)}{\ln(b)}\right)^2-6x\ln(b)\left(1+\frac{\ln(a)}{\ln(b)}\right)+6\right)e^{x\ln(b)\left(1+\frac{\ln(a)}{\ln(b)}\right)}}{3}}{\ln(b)^3\left(1+\frac{\ln(a)}{\ln(b)}\right)^3}$	72
norman	$\frac{x^2 e^{\ln(a)x}e^{\ln(b)x}}{\ln(a)+\ln(b)}-\frac{2x\,e^{\ln(a)x}e^{\ln(b)x}}{\ln(b)^2+2\ln(b)\ln(a)+\ln(a)^2}+\frac{2\,e^{\ln(a)x}e^{\ln(b)x}}{\left(\ln(b)^2+2\ln(b)\ln(a)+\ln(a)^2\right)(\ln(a)+\ln(b))}$	89

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x*b^x*x^2,x,method=_RETURNVERBOSE)
```

```
[Out] (ln(b)^2*x^2+2*ln(b)*ln(a)*x^2+ln(a)^2*x^2-2*ln(b)*x-2*ln(a)*x+2)*a^x/(ln(a
)+ln(b))^3*b^x
```

Maxima [A]
time = 0.28, size = 67, normalized size = 1.37

$$\frac{\left(\left(\log\left(a\right)^{2}+2\,\log\left(a\right)\log\left(b\right)+\log\left(b\right)^{2}\right)x^{2}-2\,x\left(\log\left(a\right)+\log\left(b\right)\right)+2\right)e^{\left(x\log\left(a\right)+x\log\left(b\right)\right)}}{\log\left(a\right)^{3}+3\,\log\left(a\right)^{2}\log\left(b\right)+3\,\log\left(a\right)\log\left(b\right)^{2}+\log\left(b\right)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x*x^2,x, algorithm="maxima")
```

```
[Out] ((log(a)^2 + 2*log(a)*log(b) + log(b)^2)*x^2 - 2*x*(log(a) + log(b)) + 2)*e
^(x*log(a) + x*log(b))/(log(a)^3 + 3*log(a)^2*log(b) + 3*log(a)*log(b)^2 +
log(b)^3)
```

Fricas [A]
time = 0.36, size = 71, normalized size = 1.45

$$\frac{\left(x^{2}\log\left(a\right)^{2}+x^{2}\log\left(b\right)^{2}-2\,x\log\left(a\right)+2\left(x^{2}\log\left(a\right)-x\right)\log\left(b\right)+2\right)a^{x}b^{x}}{\log\left(a\right)^{3}+3\,\log\left(a\right)^{2}\log\left(b\right)+3\,\log\left(a\right)\log\left(b\right)^{2}+\log\left(b\right)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x*x^2,x, algorithm="fricas")
```

```
[Out] (x^2*log(a)^2 + x^2*log(b)^2 - 2*x*log(a) + 2*(x^2*log(a) - x)*log(b) + 2)*
a^x*b^x/(log(a)^3 + 3*log(a)^2*log(b) + 3*log(a)*log(b)^2 + log(b)^3)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 583 vs. $2(51) = 102$.
time = 0.52, size = 583, normalized size = 11.90

$$\begin{cases} \frac{a^{x}b^{x}x^{2}\log\left(a\right)^{2}}{\log\left(a\right)^{3}+3\log\left(a\right)^{2}\log\left(b\right)+3\log\left(a\right)\log\left(b\right)^{2}+\log\left(b\right)^{3}}+\frac{2a^{x}b^{x}x^{2}\log\left(a\right)\log\left(b\right)}{\log\left(a\right)^{3}+3\log\left(a\right)^{2}\log\left(b\right)+3\log\left(a\right)\log\left(b\right)^{2}+\log\left(b\right)^{3}}+\frac{a^{x}b^{x}x^{2}\log\left(b\right)^{2}}{\log\left(a\right)^{3}+3\log\left(a\right)^{2}\log\left(b\right)+3\log\left(a\right)\log\left(b\right)^{2}+\log\left(b\right)^{3}}-\frac{2a^{x}b^{x}x\log\left(a\right)}{\log\left(a\right)^{3}+3\log\left(a\right)^{2}\log\left(b\right)+3\log\left(a\right)\log\left(b\right)^{2}+\log\left(b\right)^{3}}-\frac{2a^{x}b^{x}x\log\left(b\right)}{\log\left(a\right)^{3}+3\log\left(a\right)^{2}\log\left(b\right)+3\log\left(a\right)\log\left(b\right)^{2}+\log\left(b\right)^{3}}+\frac{2a^{x}b^{x}}{\log\left(a\right)^{3}+3\log\left(a\right)^{2}\log\left(b\right)+3\log\left(a\right)\log\left(b\right)^{2}+\log\left(b\right)^{3}} & \text{for}\: a \neq \frac{1}{b} \\ \frac{b^{x}x^{2}\left(\frac{1}{b}\right)^{x}\log\left(\frac{1}{b}\right)^{2}}{\log\left(\frac{1}{b}\right)^{3}+3\log\left(\frac{1}{b}\right)^{2}\log\left(b\right)+3\log\left(\frac{1}{b}\right)\log\left(b\right)^{2}+\log\left(b\right)^{3}}+\frac{2b^{x}x^{2}\left(\frac{1}{b}\right)^{x}\log\left(\frac{1}{b}\right)\log\left(b\right)}{\log\left(\frac{1}{b}\right)^{3}+3\log\left(\frac{1}{b}\right)^{2}\log\left(b\right)+3\log\left(\frac{1}{b}\right)\log\left(b\right)^{2}+\log\left(b\right)^{3}}+\frac{b^{x}x^{2}\left(\frac{1}{b}\right)^{x}\log\left(b\right)^{2}}{\log\left(\frac{1}{b}\right)^{3}+3\log\left(\frac{1}{b}\right)^{2}\log\left(b\right)+3\log\left(\frac{1}{b}\right)\log\left(b\right)^{2}+\log\left(b\right)^{3}}-\frac{2b^{x}x\left(\frac{1}{b}\right)^{x}\log\left(\frac{1}{b}\right)}{\log\left(\frac{1}{b}\right)^{3}+3\log\left(\frac{1}{b}\right)^{2}\log\left(b\right)+3\log\left(\frac{1}{b}\right)\log\left(b\right)^{2}+\log\left(b\right)^{3}}-\frac{2b^{x}x\left(\frac{1}{b}\right)^{x}\log\left(b\right)}{\log\left(\frac{1}{b}\right)^{3}+3\log\left(\frac{1}{b}\right)^{2}\log\left(b\right)+3\log\left(\frac{1}{b}\right)\log\left(b\right)^{2}+\log\left(b\right)^{3}}+\frac{2b^{x}\left(\frac{1}{b}\right)^{x}}{\log\left(\frac{1}{b}\right)^{3}+3\log\left(\frac{1}{b}\right)^{2}\log\left(b\right)+3\log\left(\frac{1}{b}\right)\log\left(b\right)^{2}+\log\left(b\right)^{3}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a**x*b**x*x**2,x)
```

```
[Out] Piecewise((a**x*b**x*x**2*log(a)**2/(log(a)**3 + 3*log(a)**2*log(b) + 3*log
(a)*log(b)**2 + log(b)**3) + 2*a**x*b**x*x**2*log(a)*log(b)/(log(a)**3 + 3*
log(a)**2*log(b) + 3*log(a)*log(b)**2 + log(b)**3) + a**x*b**x*x**2*log(b)*
*2/(log(a)**3 + 3*log(a)**2*log(b) + 3*log(a)*log(b)**2 + log(b)**3) - 2*a*
*x*b**x*x*log(a)/(log(a)**3 + 3*log(a)**2*log(b) + 3*log(a)*log(b)**2 + log
(b)**3) - 2*a**x*b**x*x*log(b)/(log(a)**3 + 3*log(a)**2*log(b) + 3*log(a)*l
og(b)**2 + log(b)**3) + 2*a**x*b**x/(log(a)**3 + 3*log(a)**2*log(b) + 3*log
(a)*log(b)**2 + log(b)**3), Ne(a, 1/b)), (b**x*x**2*(1/b)**x*log(1/b)**2/(l
og(1/b)**3 + 3*log(1/b)**2*log(b) + 3*log(1/b)*log(b)**2 + log(b)**3) + 2*b
**x*x**2*(1/b)**x*log(1/b)*log(b)/(log(1/b)**3 + 3*log(1/b)**2*log(b) + 3*l
og(1/b)*log(b)**2 + log(b)**3) + b**x*x**2*(1/b)**x*log(b)**2/(log(1/b)**3
```

```
+ 3*log(1/b)**2*log(b) + 3*log(1/b)*log(b)**2 + log(b)**3) - 2*b**x*x*(1/b)
**x*log(1/b)/(log(1/b)**3 + 3*log(1/b)**2*log(b) + 3*log(1/b)*log(b)**2 + l
og(b)**3) - 2*b**x*x*(1/b)**x*log(b)/(log(1/b)**3 + 3*log(1/b)**2*log(b) +
3*log(1/b)*log(b)**2 + log(b)**3) + 2*b**x*(1/b)**x/(log(1/b)**3 + 3*log(1/
b)**2*log(b) + 3*log(1/b)*log(b)**2 + log(b)**3), True))
```

Giac [C] Result contains complex when optimal does not.
time = 5.49, size = 2631, normalized size = 53.69

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x*x^2,x, algorithm="giac")
```

```
[Out] ((2*(pi*x^2*log(abs(a))*sgn(a) + pi*x^2*log(abs(b))*sgn(a) + pi*x^2*log(abs
(a))*sgn(b) + pi*x^2*log(abs(b))*sgn(b) - 2*pi*x^2*log(abs(a)) - 2*pi*x^2*l
og(abs(b)) - pi*x*sgn(a) - pi*x*sgn(b) + 2*pi*x)*(3*pi^3*sgn(a)*sgn(b) - 4*
pi^3*sgn(a) + 3*pi*log(abs(a))^2*sgn(a) + 6*pi*log(abs(a))*log(abs(b))*sgn(
a) + 3*pi*log(abs(b))^2*sgn(a) - 4*pi^3*sgn(b) + 3*pi*log(abs(a))^2*sgn(b)
+ 6*pi*log(abs(a))*log(abs(b))*sgn(b) + 3*pi*log(abs(b))^2*sgn(b) + 5*pi^3
- 6*pi*log(abs(a))^2 - 12*pi*log(abs(a))*log(abs(b)) - 6*pi*log(abs(b))^2)/
((3*pi^3*sgn(a)*sgn(b) - 4*pi^3*sgn(a) + 3*pi*log(abs(a))^2*sgn(a) + 6*pi*l
og(abs(a))*log(abs(b))*sgn(a) + 3*pi*log(abs(b))^2*sgn(a) - 4*pi^3*sgn(b) +
 3*pi*log(abs(a))^2*sgn(b) + 6*pi*log(abs(a))*log(abs(b))*sgn(b) + 3*pi*log
(abs(b))^2*sgn(b) + 5*pi^3 - 6*pi*log(abs(a))^2 - 12*pi*log(abs(a))*log(abs
(b)) - 6*pi*log(abs(b))^2)^2 + (3*pi^2*log(abs(a))*sgn(a)*sgn(b) + 3*pi^2*l
og(abs(b))*sgn(a)*sgn(b) - 6*pi^2*log(abs(a))*sgn(a) - 6*pi^2*log(abs(b))*s
gn(a) - 6*pi^2*log(abs(a))*sgn(b) - 6*pi^2*log(abs(b))*sgn(b) + 9*pi^2*log(
abs(a)) - 2*log(abs(a))^3 + 9*pi^2*log(abs(b)) - 6*log(abs(a))^2*log(abs(b)
) - 6*log(abs(a))*log(abs(b))^2 - 2*log(abs(b))^3)^2) + (pi^2*x^2*sgn(a)*sg
n(b) - 2*pi^2*x^2*sgn(a) - 2*pi^2*x^2*sgn(b) + 3*pi^2*x^2 - 2*x^2*log(abs(a
))^2 - 4*x^2*log(abs(a))*log(abs(b)) - 2*x^2*log(abs(b))^2 + 4*x*log(abs(a)
) + 4*x*log(abs(b)) - 4)*(3*pi^2*log(abs(a))*sgn(a)*sgn(b) + 3*pi^2*log(abs
(b))*sgn(a)*sgn(b) - 6*pi^2*log(abs(a))*sgn(a) - 6*pi^2*log(abs(b))*sgn(a)
- 6*pi^2*log(abs(a))*sgn(b) - 6*pi^2*log(abs(b))*sgn(b) + 9*pi^2*log(abs(a)
) - 2*log(abs(a))^3 + 9*pi^2*log(abs(b)) - 6*log(abs(a))^2*log(abs(b)) - 6*
log(abs(a))*log(abs(b))^2 - 2*log(abs(b))^3)/((3*pi^3*sgn(a)*sgn(b) - 4*pi^
3*sgn(a) + 3*pi*log(abs(a))^2*sgn(a) + 6*pi*log(abs(a))*log(abs(b))*sgn(a)
+ 3*pi*log(abs(b))^2*sgn(a) - 4*pi^3*sgn(b) + 3*pi*log(abs(a))^2*sgn(b) + 6
*pi*log(abs(a))*log(abs(b))*sgn(b) + 3*pi*log(abs(b))^2*sgn(b) + 5*pi^3 - 6
*pi*log(abs(a))^2 - 12*pi*log(abs(a))*log(abs(b)) - 6*pi*log(abs(b))^2)^2 +
 (3*pi^2*log(abs(a))*sgn(a)*sgn(b) + 3*pi^2*log(abs(b))*sgn(a)*sgn(b) - 6*p
i^2*log(abs(a))*sgn(a) - 6*pi^2*log(abs(b))*sgn(a) - 6*pi^2*log(abs(a))*sgn
(b) - 6*pi^2*log(abs(b))*sgn(b) + 9*pi^2*log(abs(a)) - 2*log(abs(a))^3 + 9*
pi^2*log(abs(b)) - 6*log(abs(a))^2*log(abs(b)) - 6*log(abs(a))*log(abs(b))^
```

```
2 - 2*log(abs(b))^3)^2))*cos(-1/2*pi*x*sgn(a) - 1/2*pi*x*sgn(b) + pi*x) + (
(pi^2*x^2*sgn(a)*sgn(b) - 2*pi^2*x^2*sgn(a) - 2*pi^2*x^2*sgn(b) + 3*pi^2*x^
2 - 2*x^2*log(abs(a))^2 - 4*x^2*log(abs(a))*log(abs(b)) - 2*x^2*log(abs(b))
^2 + 4*x*log(abs(a)) + 4*x*log(abs(b)) - 4)*(3*pi^3*sgn(a)*sgn(b) - 4*pi^3*
sgn(a) + 3*pi*log(abs(a))^2*sgn(a) + 6*pi*log(abs(a))*log(abs(b))*sgn(a) +
3*pi*log(abs(b))^2*sgn(a) - 4*pi^3*sgn(b) + 3*pi*log(abs(a))^2*sgn(b) + 6*p
i*log(abs(a))*log(abs(b))*sgn(b) + 3*pi*log(abs(b))^2*sgn(b) + 5*pi^3 - 6*p
i*log(abs(a))^2 - 12*pi*log(abs(a))*log(abs(b)) - 6*pi*log(abs(b))^2)/((3*p
i^3*sgn(a)*sgn(b) - 4*pi^3*sgn(a) + 3*pi*log(abs(a))^2*sgn(a) + 6*pi*log(ab
s(a))*log(abs(b))*sgn(a) + 3*pi*log(abs(b))^2*sgn(a) - 4*pi^3*sgn(b) + 3*pi
*log(abs(a))^2*sgn(b) + 6*pi*log(abs(a))*log(abs(b))*sgn(b) + 3*pi*log(abs(
b))^2*sgn(b) + 5*pi^3 - 6*pi*log(abs(a))^2 - 12*pi*log(abs(a))*log(abs(b))
- 6*pi*log(abs(b))^2)^2 + (3*pi^2*log(abs(a))*sgn(a)*sgn(b) + 3*pi^2*log(ab
s(b))*sgn(a)*sgn(b) - 6*pi^2*log(abs(a))*sgn(a) - 6*pi^2*log(abs(b))*sgn(a)
 - 6*pi^2*log(abs(a))*sgn(b) - 6*pi^2*log(abs(b))*sgn(b) + 9*pi^2*log(abs(a
)) - 2*log(abs(a))^3 + 9*pi^2*log(abs(b)) - 6*log(abs(a))^2*log(abs(b)) - 6
*log(abs(a))*log(abs(b))^2 - 2*log(abs(b))^3)^2) - 2*(pi*x^2*log(abs(a))*sg
n(a) + pi*x^2*log(abs(b))*sgn(a) + pi*x^2*log(abs(a))*sgn(b) + pi*x^2*log(a
bs(b))*sgn(b) - 2*pi*x^2*log(abs(a)) - 2*pi*x^2*log(abs(b)) - pi*x*sgn(a) -
 pi*x*sgn(b) + 2*pi*x)*(3*pi^2*log(abs(a))*sgn(a)*sgn(b) + 3*pi^2*log(abs(b
))*sgn(a)*sgn(b) - 6*pi^2*log(abs(a))*sgn(a) - 6*pi^2*log(abs(b))*sgn(a) -
6*pi^2*log(abs(a))*sgn(b) - 6*pi^2*log(abs(b))*sgn(b) + 9*pi^2*log(abs(a))
- 2*log(abs(a))^3 + 9*pi^2*log(abs(b)) - 6*log(abs(a))^2*log(abs(b)) - 6*lo
g(abs(a))*log(abs(b))^2 - 2*log(abs(b))^3)/((3*pi^3*sgn(a)*sgn(b) - 4*pi^3*
sgn(a) + 3*pi*log(abs(a))^2*sgn(a) + 6*pi*log(abs(a))*log(abs(b))*sgn(a) +
3*pi*log(abs(b))^2*sgn(a) - 4*pi^3*sgn(b) + 3*pi*log(abs(a))^2*sgn(b) + 6*p
i*log(abs(a))*log(abs(b))*sgn(b) + 3*pi*log(abs(b))^2*sgn(b) + 5*pi^3 - 6*p
i*log(abs(a))^2 - 12*pi*log(abs(a))*log(abs(b)) - 6*pi*log(abs(b))^2)^2 + (
3*pi^2*log(abs(a))*sgn(a)*sgn(b) + 3*pi^2*log(abs(b))*sgn(a)*sgn(b) - 6*pi^
2*log(abs(a))*sgn(a) - 6*pi^2*log(abs(b))*sgn(a) - 6*pi^2*log(abs(a))*sgn(b
) - 6*pi^2*log(abs(b))*sgn(b) + 9*pi^2*log(abs(a)) - 2*log(abs(a))^3 + 9*pi
^2*log(abs(b)) - 6*log(abs(a))^2*log(abs(b)) - 6*log(abs(a))*log(abs(b))^2
- 2*log(abs(b))^3)^2))*sin(-1/2*pi*x*sgn(a) - 1/2*pi*x*sgn(b) + pi*x))*e^(x
*(log(abs(a)) + log(abs(b)))) - 2*I*((I*pi^2*x^2*sgn(a)*sgn(b) - 2*I*pi^2*x
^2*sgn(a) + 2*pi*x^2*log(abs(a))*sgn(a) + 2*pi*x^2*log(abs(b))*sgn(a) - 2*I
*pi^2*x^2*sgn(b) + 2*pi*x^2*log(abs(a))*sgn(b) ...
```

Mupad [B]

time = 0.05, size = 35, normalized size = 0.71

$$\frac{a^x\,b^x\,\left(x^2\,{\left(\ln\left(a\right)+\ln\left(b\right)\right)}^2-2\,x\,\left(\ln\left(a\right)+\ln\left(b\right)\right)+2\right)}{{\left(\ln\left(a\right)+\ln\left(b\right)\right)}^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x*b^x*x^2,x)
```

```
[Out] (a^x*b^x*(x^2*(log(a) + log(b))^2 - 2*x*(log(a) + log(b)) + 2))/(log(a) + l
og(b))^3
```

3.564 $\int a^x b^x x \, dx$

Optimal. Leaf size=31

$$-\frac{a^x b^x}{(\log(a)+\log(b))^2}+\frac{a^x b^x x}{\log(a)+\log(b)}$$

```
[Out] -a^x*b^x/(ln(a)+ln(b))^2+a^x*b^x*x/(ln(a)+ln(b))
```

Rubi [A]
time = 0.02, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {2325, 2207, 2225}

$$\frac{x a^x b^x}{\log(a)+\log(b)}-\frac{a^x b^x}{(\log(a)+\log(b))^2}$$

Antiderivative was successfully verified.

```
[In] Int[a^x*b^x*x,x]
```

```
[Out] -((a^x*b^x)/(Log[a] + Log[b])^2) + (a^x*b^x*x)/(Log[a] + Log[b])
```

Rule 2207

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[(c + d*x)^m*((b*F^(g*(e + f*x)))^n/(f*g*n*Log[F])),
x] - Dist[d*(m/(f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !TrueQ[$UseGamma]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2325

```
Int[(u_.)*(F_)^(v_)*(G_)^(w_), x_Symbol] :> With[{z = v*Log[F] + w*Log[G]},
 Int[u*NormalizeIntegrand[E^z, x], x] /; BinomialQ[z, x] || (PolynomialQ[z,
 x] && LeQ[Exponent[z, x], 2])] /; FreeQ[{F, G}, x]
```

Rubi steps

$$\int a^x b^x x\,dx = \int e^{x(\log(a)+\log(b))} x\,dx$$
$$= \frac{a^x b^x x}{\log(a)+\log(b)} - \frac{\int e^{x(\log(a)+\log(b))}\,dx}{\log(a)+\log(b)}$$
$$= -\frac{a^x b^x}{(\log(a)+\log(b))^2} + \frac{a^x b^x x}{\log(a)+\log(b)}$$

Mathematica [A]
time = 0.02, size = 26, normalized size = 0.84

$$a^x b^x \left(-\frac{1}{(\log(a)+\log(b))^2} + \frac{x}{\log(a)+\log(b)}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[a^x*b^x*x,x]
[Out] a^x*b^x*(-(Log[a] + Log[b])^(-2) + x/(Log[a] + Log[b]))
```

Maple [A]
time = 0.02, size = 25, normalized size = 0.81

method	result	size
gosper	$\frac{(\ln(b)x+\ln(a)x-1)a^x b^x}{(\ln(a)+\ln(b))^2}$	25
risch	$\frac{(\ln(b)x+\ln(a)x-1)a^x b^x}{(\ln(a)+\ln(b))^2}$	25
norman	$\frac{x\,\mathrm{e}^{\ln(a)x}\mathrm{e}^{\ln(b)x}}{\ln(a)+\ln(b)} - \frac{\mathrm{e}^{\ln(a)x}\mathrm{e}^{\ln(b)x}}{(\ln(a)+\ln(b))^2}$	40
meijerg	$\frac{1-\frac{\left(2-2x\ln(b)\left(1+\frac{\ln(a)}{\ln(b)}\right)\right)\mathrm{e}^{x\ln(b)\left(1+\frac{\ln(a)}{\ln(b)}\right)}}{2}}{\ln(b)^2\left(1+\frac{\ln(a)}{\ln(b)}\right)^2}$	51

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x*b^x*x,x,method=_RETURNVERBOSE)
[Out] (ln(b)*x+ln(a)*x-1)*a^x*b^x/(ln(a)+ln(b))^2
```

Maxima [A]
time = 0.28, size = 37, normalized size = 1.19

$$\frac{(x(\log(a)+\log(b))-1)e^{(x\log(a)+x\log(b))}}{\log(a)^2+2\log(a)\log(b)+\log(b)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x*x,x, algorithm="maxima")
```

```
[Out] (x*(log(a) + log(b)) - 1)*e^(x*log(a) + x*log(b))/(log(a)^2 + 2*log(a)*log(
b) + log(b)^2)
```

Fricas [A]
time = 0.40, size = 34, normalized size = 1.10

$$\frac{(x\log(a)+x\log(b)-1)a^x b^x}{\log(a)^2+2\log(a)\log(b)+\log(b)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x*x,x, algorithm="fricas")
```

```
[Out] (x*log(a) + x*log(b) - 1)*a^x*b^x/(log(a)^2 + 2*log(a)*log(b) + log(b)^2)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 190 vs. 2(29) = 58.
time = 0.35, size = 190, normalized size = 6.13

$$\begin{cases} \frac{a^x b^x x\log(a)}{\log(a)^2+2\log(a)\log(b)+\log(b)^2}+\frac{a^x b^x x\log(b)}{\log(a)^2+2\log(a)\log(b)+\log(b)^2}-\frac{a^x b^x}{\log(a)^2+2\log(a)\log(b)+\log(b)^2} & \text{for}\ a\neq\frac{1}{b} \\ \frac{b^x x\left(\frac{1}{b}\right)^x\log\left(\frac{1}{b}\right)}{\log\left(\frac{1}{b}\right)^2+2\log\left(\frac{1}{b}\right)\log(b)+\log(b)^2}+\frac{b^x x\left(\frac{1}{b}\right)^x\log(b)}{\log\left(\frac{1}{b}\right)^2+2\log\left(\frac{1}{b}\right)\log(b)+\log(b)^2}-\frac{b^x\left(\frac{1}{b}\right)^x}{\log\left(\frac{1}{b}\right)^2+2\log\left(\frac{1}{b}\right)\log(b)+\log(b)^2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a**x*b**x*x,x)
```

```
[Out] Piecewise((a**x*b**x*x*log(a)/(log(a)**2 + 2*log(a)*log(b) + log(b)**2) + a
**x*b**x*x*log(b)/(log(a)**2 + 2*log(a)*log(b) + log(b)**2) - a**x*b**x/(lo
g(a)**2 + 2*log(a)*log(b) + log(b)**2), Ne(a, 1/b)), (b**x*x*(1/b)**x*log(1
/b)/(log(1/b)**2 + 2*log(1/b)*log(b) + log(b)**2) + b**x*x*(1/b)**x*log(b)/
(log(1/b)**2 + 2*log(1/b)*log(b) + log(b)**2) - b**x*(1/b)**x/(log(1/b)**2
+ 2*log(1/b)*log(b) + log(b)**2), True))
```

Giac [C] Result contains complex when optimal does not.
time = 4.77, size = 994, normalized size = 32.06

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x*x,x, algorithm="giac")
```

```
[Out] (2*((pi*x*sgn(a) + pi*x*sgn(b) - 2*pi*x)*(pi*log(abs(a))*sgn(a) + pi*log(ab
s(b))*sgn(a) + pi*log(abs(a))*sgn(b) + pi*log(abs(b))*sgn(b) - 2*pi*log(abs
```

```
(a)) - 2*pi*log(abs(b)))/((pi^2*sgn(a)*sgn(b) - 2*pi^2*sgn(a) - 2*pi^2*sgn(
b) + 3*pi^2 - 2*log(abs(a))^2 - 4*log(abs(a))*log(abs(b)) - 2*log(abs(b))^2
)^2 + 4*(pi*log(abs(a))*sgn(a) + pi*log(abs(b))*sgn(a) + pi*log(abs(a))*sgn
(b) + pi*log(abs(b))*sgn(b) - 2*pi*log(abs(a)) - 2*pi*log(abs(b)))^2) - (pi
^2*sgn(a)*sgn(b) - 2*pi^2*sgn(a) - 2*pi^2*sgn(b) + 3*pi^2 - 2*log(abs(a))^2
 - 4*log(abs(a))*log(abs(b)) - 2*log(abs(b))^2)*(x*log(abs(a)) + x*log(abs(
b)) - 1)/((pi^2*sgn(a)*sgn(b) - 2*pi^2*sgn(a) - 2*pi^2*sgn(b) + 3*pi^2 - 2*
log(abs(a))^2 - 4*log(abs(a))*log(abs(b)) - 2*log(abs(b))^2)^2 + 4*(pi*log(
abs(a))*sgn(a) + pi*log(abs(b))*sgn(a) + pi*log(abs(a))*sgn(b) + pi*log(abs
(b))*sgn(b) - 2*pi*log(abs(a)) - 2*pi*log(abs(b)))^2))*cos(-1/2*pi*x*sgn(a)
 - 1/2*pi*x*sgn(b) + pi*x) - ((pi^2*sgn(a)*sgn(b) - 2*pi^2*sgn(a) - 2*pi^2*
sgn(b) + 3*pi^2 - 2*log(abs(a))^2 - 4*log(abs(a))*log(abs(b)) - 2*log(abs(b
))^2)*(pi*x*sgn(a) + pi*x*sgn(b) - 2*pi*x)/((pi^2*sgn(a)*sgn(b) - 2*pi^2*sg
n(a) - 2*pi^2*sgn(b) + 3*pi^2 - 2*log(abs(a))^2 - 4*log(abs(a))*log(abs(b))
 - 2*log(abs(b))^2)^2 + 4*(pi*log(abs(a))*sgn(a) + pi*log(abs(b))*sgn(a) +
pi*log(abs(a))*sgn(b) + pi*log(abs(b))*sgn(b) - 2*pi*log(abs(a)) - 2*pi*log
(abs(b)))^2) + 4*(pi*log(abs(a))*sgn(a) + pi*log(abs(b))*sgn(a) + pi*log(ab
s(a))*sgn(b) + pi*log(abs(b))*sgn(b) - 2*pi*log(abs(a)) - 2*pi*log(abs(b)))
*(x*log(abs(a)) + x*log(abs(b)) - 1)/((pi^2*sgn(a)*sgn(b) - 2*pi^2*sgn(a) -
 2*pi^2*sgn(b) + 3*pi^2 - 2*log(abs(a))^2 - 4*log(abs(a))*log(abs(b)) - 2*l
og(abs(b))^2)^2 + 4*(pi*log(abs(a))*sgn(a) + pi*log(abs(b))*sgn(a) + pi*log
(abs(a))*sgn(b) + pi*log(abs(b))*sgn(b) - 2*pi*log(abs(a)) - 2*pi*log(abs(b
)))^2))*sin(-1/2*pi*x*sgn(a) - 1/2*pi*x*sgn(b) + pi*x))*e^(x*(log(abs(a)) +
 log(abs(b)))) + 1/2*I*((pi*x*sgn(a) + pi*x*sgn(b) - 2*pi*x - 2*I*x*log(abs
(a)) - 2*I*x*log(abs(b)) + 2*I)*e^(1/2*I*pi*x*sgn(a) + 1/2*I*pi*x*sgn(b) -
I*pi*x)/(pi^2*sgn(a)*sgn(b) - 2*pi^2*sgn(a) - 2*I*pi*log(abs(a))*sgn(a) - 2
*I*pi*log(abs(b))*sgn(a) - 2*pi^2*sgn(b) - 2*I*pi*log(abs(a))*sgn(b) - 2*I*
pi*log(abs(b))*sgn(b) + 3*pi^2 + 4*I*pi*log(abs(a)) - 2*log(abs(a))^2 + 4*I
*pi*log(abs(b)) - 4*log(abs(a))*log(abs(b)) - 2*log(abs(b))^2) + (pi*x*sgn(
a) + pi*x*sgn(b) - 2*pi*x + 2*I*x*log(abs(a)) + 2*I*x*log(abs(b)) - 2*I)*e^
(-1/2*I*pi*x*sgn(a) - 1/2*I*pi*x*sgn(b) + I*pi*x)/(pi^2*sgn(a)*sgn(b) - 2*p
i^2*sgn(a) + 2*I*pi*log(abs(a))*sgn(a) + 2*I*pi*log(abs(b))*sgn(a) - 2*pi^2
*sgn(b) + 2*I*pi*log(abs(a))*sgn(b) + 2*I*pi*log(abs(b))*sgn(b) + 3*pi^2 -
4*I*pi*log(abs(a)) - 2*log(abs(a))^2 - 4*I*pi*log(abs(b)) - 4*log(abs(a))*l
og(abs(b)) - 2*log(abs(b))^2))*e^(x*(log(abs(a)) + log(abs(b))))
```

Mupad [B]
time = 0.02, size = 23, normalized size = 0.74

$$\frac{a^x\,b^x\,\left(x\,\left(\ln\left(a\right)+\ln\left(b\right)\right)-1\right)}{{\left(\ln\left(a\right)+\ln\left(b\right)\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x*b^x*x,x)
```

```
[Out] (a^x*b^x*(x*(log(a) + log(b)) - 1))/(log(a) + log(b))^2
```

3.565 $\int a^x b^x \, dx$

Optimal. Leaf size=14

$$\frac{a^x b^x}{\log(a) + \log(b)}$$

```
[Out] a^x*b^x/(ln(a)+ln(b))
```

Rubi [A]
time = 0.01, antiderivative size = 14, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {2325, 2225}

$$\frac{a^x b^x}{\log(a) + \log(b)}$$

Antiderivative was successfully verified.

```
[In] Int[a^x*b^x,x]
```

```
[Out] (a^x*b^x)/(Log[a] + Log[b])
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2325

```
Int[(u_.)*(F_)^(v_)*(G_)^(w_), x_Symbol] :> With[{z = v*Log[F] + w*Log[G]},
 Int[u*NormalizeIntegrand[E^z, x], x] /; BinomialQ[z, x] || (PolynomialQ[z,
 x] && LeQ[Exponent[z, x], 2])] /; FreeQ[{F, G}, x]
```

Rubi steps

$$\begin{aligned}\int a^x b^x \, dx &= \int e^{x(\log(a)+\log(b))} \, dx\\ &= \frac{a^x b^x}{\log(a) + \log(b)}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 14, normalized size = 1.00

$$\frac{a^x b^x}{\log(a) + \log(b)}$$

Antiderivative was successfully verified.

```
[In] Integrate[a^x*b^x,x]
```

```
[Out] (a^x*b^x)/(Log[a] + Log[b])
```

Maple [A]
time = 0.02, size = 15, normalized size = 1.07

method	result	size
gosper	$\frac{a^x b^x}{\ln(a)+\ln(b)}$	15
risch	$\frac{a^x b^x}{\ln(a)+\ln(b)}$	15
norman	$\frac{e^{\ln(a)x} e^{\ln(b)x}}{\ln(a)+\ln(b)}$	19
meijerg	$-\frac{1-e^{x\ln(b)\left(1+\frac{\ln(a)}{\ln(b)}\right)}}{\ln(b)\left(1+\frac{\ln(a)}{\ln(b)}\right)}$	36

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x*b^x,x,method=_RETURNVERBOSE)
```

```
[Out] a^x*b^x/(ln(a)+ln(b))
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(log(b)/log(a)>0)', see `assume?` fo
r more
```

Fricas [A]
time = 0.39, size = 14, normalized size = 1.00

$$\frac{a^x b^x}{\log(a) + \log(b)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x,x, algorithm="fricas")
```

```
[Out] a^x*b^x/(log(a) + log(b))
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 31 vs. $2(12) = 24$.
time = 0.24, size = 31, normalized size = 2.21

$$\begin{cases} \frac{a^x b^x}{\log(a)+\log(b)} & \text{for } a \neq \frac{1}{b} \\ \frac{b^x \left(\frac{1}{b}\right)^x}{\log\left(\frac{1}{b}\right)+\log(b)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a**x*b**x,x)
```

```
[Out] Piecewise((a**x*b**x/(log(a) + log(b)), Ne(a, 1/b)), (b**x*(1/b)**x/(log(1/
b) + log(b)), True))
```

Giac [C] Result contains complex when optimal does not.
time = 5.86, size = 237, normalized size = 16.93

$$2\left(\frac{2\left(\log(|a|)+\log(|b|)\right)\cos\left(-\frac{1}{2}\pi x \operatorname{sgn}(a)-\frac{1}{2}\pi x \operatorname{sgn}(b)+\pi x\right)}{\left(2\pi-\pi \operatorname{sgn}(a)-\pi \operatorname{sgn}(b)\right)^2+4\left(\log(|a|)+\log(|b|)\right)^2}+\frac{\left(2\pi-\pi \operatorname{sgn}(a)-\pi \operatorname{sgn}(b)\right)\sin\left(-\frac{1}{2}\pi x \operatorname{sgn}(a)-\frac{1}{2}\pi x \operatorname{sgn}(b)+\pi x\right)}{\left(2\pi-\pi \operatorname{sgn}(a)-\pi \operatorname{sgn}(b)\right)^2+4\left(\log(|a|)+\log(|b|)\right)^2}\right)e^{(x(\log(|a|)+\log(|b|)))}+i\left(\frac{i e^{\left(\frac{1}{2}i\pi x \operatorname{sgn}(a)+\frac{1}{2}i\pi x \operatorname{sgn}(b)-i\pi x\right)}}{-2i\pi+i\pi \operatorname{sgn}(a)+i\pi \operatorname{sgn}(b)+2\log(|a|)+2\log(|b|)}-\frac{i e^{\left(-\frac{1}{2}i\pi x \operatorname{sgn}(a)-\frac{1}{2}i\pi x \operatorname{sgn}(b)+i\pi x\right)}}{2i\pi-i\pi \operatorname{sgn}(a)-i\pi \operatorname{sgn}(b)+2\log(|a|)+2\log(|b|)}\right)e^{(x(\log(|a|)+\log(|b|)))}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x,x, algorithm="giac")
```

```
[Out] 2*(2*(log(abs(a)) + log(abs(b)))*cos(-1/2*pi*x*sgn(a) - 1/2*pi*x*sgn(b) + p
i*x)/((2*pi - pi*sgn(a) - pi*sgn(b))^2 + 4*(log(abs(a)) + log(abs(b)))^2) +
 (2*pi - pi*sgn(a) - pi*sgn(b))*sin(-1/2*pi*x*sgn(a) - 1/2*pi*x*sgn(b) + pi
*x)/((2*pi - pi*sgn(a) - pi*sgn(b))^2 + 4*(log(abs(a)) + log(abs(b)))^2))*e
^(x*(log(abs(a)) + log(abs(b)))) + I*(I*e^(1/2*I*pi*x*sgn(a) + 1/2*I*pi*x*s
gn(b) - I*pi*x)/(-2*I*pi + I*pi*sgn(a) + I*pi*sgn(b) + 2*log(abs(a)) + 2*lo
g(abs(b))) - I*e^(-1/2*I*pi*x*sgn(a) - 1/2*I*pi*x*sgn(b) + I*pi*x)/(2*I*pi
- I*pi*sgn(a) - I*pi*sgn(b) + 2*log(abs(a)) + 2*log(abs(b))))*e^(x*(log(abs
(a)) + log(abs(b))))
```

Mupad [B]
time = 3.60, size = 14, normalized size = 1.00

$$\frac{a^x\,b^x}{\ln(a)+\ln(b)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x*b^x,x)
```

```
[Out] (a^x*b^x)/(log(a) + log(b))
```

3.566 $\int \frac{a^x b^x}{x} \, dx$

Optimal. Leaf size=8

$$\mathrm{Ei}(x(\log(a)+\log(b)))$$

[Out] Ei(x*(ln(a)+ln(b)))

Rubi [A]

time = 0.03, antiderivative size = 8, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2325, 2209}

$$\mathrm{Ei}(x(\log(a)+\log(b)))$$

Antiderivative was successfully verified.

[In] Int[(a^x*b^x)/x,x]

[Out] ExpIntegralEi[x*(Log[a] + Log[b])]

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2325

```
Int[(u_.)*(F_)^(v_)*(G_)^(w_), x_Symbol] :> With[{z = v*Log[F] + w*Log[G]},
 Int[u*NormalizeIntegrand[E^z, x], x] /; BinomialQ[z, x] || (PolynomialQ[z,
 x] && LeQ[Exponent[z, x], 2])] /; FreeQ[{F, G}, x]
```

Rubi steps

$$\begin{aligned} \int \frac{a^x b^x}{x} \, dx &= \int \frac{e^{x(\log(a)+\log(b))}}{x} \, dx \\ &= \mathrm{Ei}(x(\log(a)+\log(b))) \end{aligned}$$

Mathematica [A]

time = 0.02, size = 10, normalized size = 1.25

$$\mathrm{Ei}(x\log(a)+x\log(b))$$

Antiderivative was successfully verified.

```
[In] Integrate[(a^x*b^x)/x,x]
```

```
[Out] ExpIntegralEi[x*Log[a] + x*Log[b]]
```

Maple [C] Result contains complex when optimal does not.
time = 0.02, size = 56, normalized size = 7.00

method	result
meijerg	$-\ln\left(-x\ln(b)\left(1+\frac{\ln(a)}{\ln(b)}\right)\right)-\text{expIntegral}\left(1,-x\ln(b)\left(1+\frac{\ln(a)}{\ln(b)}\right)\right)+\ln(x)+i\pi+\ln(\ln(b))+$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x*b^x/x,x,method=_RETURNVERBOSE)
```

```
[Out] -ln(-x*ln(b)*(1+ln(a)/ln(b)))-Ei(1,-x*ln(b)*(1+ln(a)/ln(b)))+ln(x)+I*Pi+ln(
ln(b))+ln(1+ln(a)/ln(b))
```

Maxima [A]
time = 0.32, size = 8, normalized size = 1.00

$$\text{Ei}(x(\log(a)+\log(b)))$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x/x,x, algorithm="maxima")
```

```
[Out] Ei(x*(log(a) + log(b)))
```

Fricas [A]
time = 0.39, size = 10, normalized size = 1.25

$$\text{Ei}(x\log(a)+x\log(b))$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x/x,x, algorithm="fricas")
```

```
[Out] Ei(x*log(a) + x*log(b))
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{a^xb^x}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a**x*b**x/x,x)
```

```
[Out] Integral(a**x*b**x/x, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x/x,x, algorithm="giac")
[Out] integrate(a^x*b^x/x, x)
```

Mupad [B]
time = 0.03, size = 8, normalized size = 1.00

$$\mathrm{ei}(x (\ln (a) + \ln (b)))$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^x*b^x)/x,x)
[Out] ei(x*(log(a) + log(b)))
```

3.567 $\int \frac{a^x b^x}{x^2}\,dx$

Optimal. Leaf size=26

$$-\frac{a^x b^x}{x}+\text{Ei}(x(\log(a)+\log(b)))(\log(a)+\log(b))$$

```
[Out] -a^x*b^x/x+Ei(x*(ln(a)+ln(b)))*(ln(a)+ln(b))
```

Rubi [A]
time = 0.04, antiderivative size = 26, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.300$, Rules used = {2325, 2208, 2209}

$$(\log(a)+\log(b))\text{Ei}(x(\log(a)+\log(b)))-\frac{a^x b^x}{x}$$

Antiderivative was successfully verified.

```
[In] Int[(a^x*b^x)/x^2,x]
```

```
[Out] -((a^x*b^x)/x) + ExpIntegralEi[x*(Log[a] + Log[b])]*(Log[a] + Log[b])
```

Rule 2208

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_), x_Symbol] :> Simp[(c + d*x)^(m + 1)*((b*F^(g*(e + f*x)))^n/(d*(m + 1)))
, x] - Dist[f*g*n*(Log[F]/(d*(m + 1))), Int[(c + d*x)^(m + 1)*(b*F^(g*(e +
f*x)))^n, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && LtQ[m, -1] && Int
egerQ[2*m] &&  !TrueQ[$UseGamma]
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2325

```
Int[(u_.)*(F_)^(v_)*(G_)^(w_), x_Symbol] :> With[{z = v*Log[F] + w*Log[G]},
 Int[u*NormalizeIntegrand[E^z, x], x] /; BinomialQ[z, x] || (PolynomialQ[z,
 x] && LeQ[Exponent[z, x], 2])] /; FreeQ[{F, G}, x]
```

Rubi steps

$$\int \frac{a^x b^x}{x^2} dx = \int \frac{e^{x(\log(a)+\log(b))}}{x^2} dx$$
$$= -\frac{a^x b^x}{x} - (-\log(a) - \log(b)) \int \frac{e^{x(\log(a)+\log(b))}}{x} dx$$
$$= -\frac{a^x b^x}{x} + \text{Ei}(x(\log(a) + \log(b)))(\log(a) + \log(b))$$

Mathematica [**F**]
time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{a^x b^x}{x^2} dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a^x*b^x)/x^2,x]
```

```
[Out] Integrate[(a^x*b^x)/x^2, x]
```

Maple [**C**] Result contains complex when optimal does not.
time = 0.03, size = 160, normalized size = 6.15

method	result
meijerg	$-\ln(b)\left(1+\frac{\ln(a)}{\ln(b)}\right)\left(-\frac{2+2x\ln(b)\left(1+\frac{\ln(a)}{\ln(b)}\right)}{2x\ln(b)\left(1+\frac{\ln(a)}{\ln(b)}\right)}+\frac{e^{x\ln(b)\left(1+\frac{\ln(a)}{\ln(b)}\right)}}{x\ln(b)\left(1+\frac{\ln(a)}{\ln(b)}\right)}+\ln\left(-x\ln(b)\left(1+\frac{\ln(a)}{\ln(b)}\right)\right)+\text{expIntegra}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x*b^x/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] -ln(b)*(1+ln(a)/ln(b))*(-1/2/x/ln(b)/(1+ln(a)/ln(b))*(2+2*x*ln(b)*(1+ln(a)/
ln(b)))+1/x/ln(b)/(1+ln(a)/ln(b))*exp(x*ln(b)*(1+ln(a)/ln(b)))+ln(-x*ln(b)*
(1+ln(a)/ln(b)))+Ei(1,-x*ln(b)*(1+ln(a)/ln(b)))+1-ln(x)-I*Pi-ln(ln(b))-ln(1
+ln(a)/ln(b))+1/x/ln(b)/(1+ln(a)/ln(b)))
```

Maxima [**A**]
time = 0.33, size = 16, normalized size = 0.62

$$(\log(a) + \log(b))\Gamma(-1, -x(\log(a) + \log(b)))$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x/x^2,x, algorithm="maxima")
```

```
[Out] (log(a) + log(b))*gamma(-1, -x*(log(a) + log(b)))
```

Fricas [**A**]
time = 0.39, size = 34, normalized size = 1.31

$$-\frac{a^x b^x - (x\log(a) + x\log(b))\text{Ei}(x\log(a) + x\log(b))}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x/x^2,x, algorithm="fricas")
[Out] -(a^x*b^x - (x*log(a) + x*log(b))*Ei(x*log(a) + x*log(b)))/x
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a^x b^x}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a**x*b**x/x**2,x)
[Out] Integral(a**x*b**x/x**2, x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x/x^2,x, algorithm="giac")
[Out] integrate(a^x*b^x/x^2, x)
```

Mupad [**B**]
time = 3.50, size = 28, normalized size = 1.08

$$-\text{expint}(-x(\ln(a) + \ln(b)))\,(\ln(a) + \ln(b)) - \frac{a^x\,b^x}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^x*b^x)/x^2,x)
[Out] - expint(-x*(log(a) + log(b)))*(log(a) + log(b)) - (a^x*b^x)/x
```

3.568 $\int \frac{a^x b^x}{x^3} \, dx$

Optimal. Leaf size=51

$$-\frac{a^x b^x}{2x^2}-\frac{a^x b^x(\log(a)+\log(b))}{2x}+\frac{1}{2}\text{Ei}(x(\log(a)+\log(b)))(\log(a)+\log(b))^2$$

```
[Out] -1/2*a^x*b^x/x^2-1/2*a^x*b^x*(ln(a)+ln(b))/x+1/2*Ei(x*(ln(a)+ln(b)))*(ln(a)
+ln(b))^2
```

Rubi [A]
time = 0.06, antiderivative size = 51, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.300$, Rules used = {2325, 2208, 2209}

$$-\frac{a^x b^x}{2x^2}-\frac{a^x b^x(\log(a)+\log(b))}{2x}+\frac{1}{2}(\log(a)+\log(b))^2\text{Ei}(x(\log(a)+\log(b)))$$

Antiderivative was successfully verified.

```
[In] Int[(a^x*b^x)/x^3,x]
```

```
[Out] -1/2*(a^x*b^x)/x^2 - (a^x*b^x*(Log[a] + Log[b]))/(2*x) + (ExpIntegralEi[x*(
Log[a] + Log[b])]*(Log[a] + Log[b])^2)/2
```

Rule 2208

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_), x_Symbol] :> Simp[(c + d*x)^(m + 1)*((b*F^(g*(e + f*x)))^n/(d*(m + 1)))
, x] - Dist[f*g*n*(Log[F]/(d*(m + 1))), Int[(c + d*x)^(m + 1)*(b*F^(g*(e +
f*x)))^n, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && LtQ[m, -1] && Int
egerQ[2*m] &&  !TrueQ[$UseGamma]
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2325

```
Int[(u_.)*(F_)^(v_)*(G_)^(w_), x_Symbol] :> With[{z = v*Log[F] + w*Log[G]},
 Int[u*NormalizeIntegrand[E^z, x], x] /; BinomialQ[z, x] || (PolynomialQ[z,
 x] && LeQ[Exponent[z, x], 2])] /; FreeQ[{F, G}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{a^x b^x}{x^3}\,dx &= \int \frac{e^{x(\log(a)+\log(b))}}{x^3}\,dx\\ &= -\frac{a^x b^x}{2x^2} - \frac{1}{2}(-\log(a)-\log(b))\int \frac{e^{x(\log(a)+\log(b))}}{x^2}\,dx\\ &= -\frac{a^x b^x}{2x^2} - \frac{a^x b^x(\log(a)+\log(b))}{2x} + \frac{1}{2}(\log(a)+\log(b))^2\int \frac{e^{x(\log(a)+\log(b))}}{x}\,dx\\ &= -\frac{a^x b^x}{2x^2} - \frac{a^x b^x(\log(a)+\log(b))}{2x} + \frac{1}{2}\mathrm{Ei}(x(\log(a)+\log(b)))(\log(a)+\log(b))^2\end{aligned}$$

Mathematica [F]
time = 0.05, size = 0, normalized size = 0.00

$$\int \frac{a^x b^x}{x^3}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(a^x*b^x)/x^3,x]
```

```
[Out] Integrate[(a^x*b^x)/x^3, x]
```

Maple [C] Result contains complex when optimal does not.
time = 0.03, size = 225, normalized size = 4.41

method	result
meijerg	$\ln(b)^2\left(1+\frac{\ln(a)}{\ln(b)}\right)^2\left(\frac{9x^2\ln(b)^2\left(1+\frac{\ln(a)}{\ln(b)}\right)^2+12x\ln(b)\left(1+\frac{\ln(a)}{\ln(b)}\right)+6}{12x^2\ln(b)^2\left(1+\frac{\ln(a)}{\ln(b)}\right)^2} - \frac{\left(3+3x\ln(b)\left(1+\frac{\ln(a)}{\ln(b)}\right)\right)e^{x\ln(b)\left(1+\frac{\ln(a)}{\ln(b)}\right)}}{6x^2\ln(b)^2\left(1+\frac{\ln(a)}{\ln(b)}\right)^2} - \ln(-$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x*b^x/x^3,x,method=_RETURNVERBOSE)
```

```
[Out] ln(b)^2*(1+ln(a)/ln(b))^2*(1/12/x^2/ln(b)^2/(1+ln(a)/ln(b))^2*(9*x^2*ln(b)^
2*(1+ln(a)/ln(b))^2+12*x*ln(b)*(1+ln(a)/ln(b))+6)-1/6/x^2/ln(b)^2/(1+ln(a)/
ln(b))^2*(3+3*x*ln(b)*(1+ln(a)/ln(b)))*exp(x*ln(b)*(1+ln(a)/ln(b)))-1/2*ln(
-x*ln(b)*(1+ln(a)/ln(b)))-1/2*Ei(1,-x*ln(b)*(1+ln(a)/ln(b)))-3/4+1/2*ln(x)+
1/2*I*Pi+1/2*ln(ln(b))+1/2*ln(1+ln(a)/ln(b))-1/2/x^2/ln(b)^2/(1+ln(a)/ln(b)
)^2-1/x/ln(b)/(1+ln(a)/ln(b)))
```

Maxima [A]
time = 0.32, size = 19, normalized size = 0.37

$$-(\log(a)+\log(b))^2\Gamma(-2,-x(\log(a)+\log(b)))$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x/x^3,x, algorithm="maxima")
[Out] -(log(a) + log(b))^2*gamma(-2, -x*(log(a) + log(b)))
```

Fricas [A]
time = 0.37, size = 61, normalized size = 1.20

$$-\frac{(x\log(a)+x\log(b)+1)a^xb^x-\left(x^2\log(a)^2+2\,x^2\log(a)\log(b)+x^2\log(b)^2\right)\mathrm{Ei}(x\log(a)+x\log(b))}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x/x^3,x, algorithm="fricas")
[Out] -1/2*((x*log(a) + x*log(b) + 1)*a^x*b^x - (x^2*log(a)^2 + 2*x^2*log(a)*log(
b) + x^2*log(b)^2)*Ei(x*log(a) + x*log(b)))/x^2
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{a^xb^x}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a**x*b**x/x**3,x)
[Out] Integral(a**x*b**x/x**3, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x/x^3,x, algorithm="giac")
[Out] integrate(a^x*b^x/x^3, x)
```

Mupad [B]
time = 0.05, size = 59, normalized size = 1.16

$$-\frac{\mathrm{expint}(-x\,(\ln(a)+\ln(b)))\,(\ln(a)+\ln(b))^2}{2}-a^x\,b^x\left(\frac{1}{2\,x\,(\ln(a)+\ln(b))}+\frac{1}{2\,x^2\,(\ln(a)+\ln(b))^2}\right)(\ln(a)+\ln(b))^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^x*b^x)/x^3,x)
[Out] - (expint(-x*(log(a) + log(b)))*(log(a) + log(b))^2)/2 - a^x*b^x*(1/(2*x*(l
og(a) + log(b))) + 1/(2*x^2*(log(a) + log(b))^2))*(log(a) + log(b))^2
```

3.569 $\int a^x b^x c^x \, dx$

Optimal. Leaf size=19

$$\frac{a^x b^x c^x}{\log(a)+\log(b)+\log(c)}$$

```
[Out] a^x*b^x*c^x/(ln(a)+ln(b)+ln(c))
```

Rubi [A]
time = 0.03, antiderivative size = 19, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2325, 2225}

$$\frac{a^x b^x c^x}{\log(a)+\log(b)+\log(c)}$$

Antiderivative was successfully verified.

```
[In] Int[a^x*b^x*c^x,x]
```

```
[Out] (a^x*b^x*c^x)/(Log[a] + Log[b] + Log[c])
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2325

```
Int[(u_.)*(F_)^(v_)*(G_)^(w_), x_Symbol] :> With[{z = v*Log[F] + w*Log[G]},
 Int[u*NormalizeIntegrand[E^z, x], x] /; BinomialQ[z, x] || (PolynomialQ[z,
 x] && LeQ[Exponent[z, x], 2])] /; FreeQ[{F, G}, x]
```

Rubi steps

$$\begin{aligned} \int a^x b^x c^x \, dx &= \int c^x e^{x(\log(a)+\log(b))} \, dx \\ &= \int e^{x(\log(a)+\log(b)+\log(c))} \, dx \\ &= \frac{a^x b^x c^x}{\log(a)+\log(b)+\log(c)} \end{aligned}$$

Mathematica [A]
time = 0.02, size = 21, normalized size = 1.11

$$\frac{e^{x(\log(a)+\log(b)+\log(c))}}{\log(a)+\log(b)+\log(c)}$$

Antiderivative was successfully verified.

```
[In] Integrate[a^x*b^x*c^x,x]
```

```
[Out] E^(x*(Log[a] + Log[b] + Log[c]))/(Log[a] + Log[b] + Log[c])
```

Maple [A]
time = 0.04, size = 20, normalized size = 1.05

method	result	size
gosper	$\frac{a^{x} b^{x} c^{x}}{\ln \left(a \right)+\ln \left(b \right)+\ln \left(c \right)}$	20
risch	$\frac{a^{x} b^{x} c^{x}}{\ln \left(a \right)+\ln \left(b \right)+\ln \left(c \right)}$	20
norman	$\frac{{\mathrm e}^{x \ln \left(c \right)} {\mathrm e}^{\ln \left(a \right) x} {\mathrm e}^{\ln \left(b \right) x}}{\ln \left(a \right)+\ln \left(b \right)+\ln \left(c \right)}$	26
meijerg	$-\frac{1-{\mathrm e}^{x \ln \left(b \right) \left(1+\frac{\ln \left(a \right)}{\ln \left(b \right)}\right) \left(1+\frac{\ln \left(c \right)}{\ln \left(b \right) \left(1+\frac{\ln \left(a \right)}{\ln \left(b \right)}\right)}\right)}}{\ln \left(b \right) \left(1+\frac{\ln \left(a \right)}{\ln \left(b \right)}\right) \left(1+\frac{\ln \left(c \right)}{\ln \left(b \right) \left(1+\frac{\ln \left(a \right)}{\ln \left(b \right)}\right)}\right)}$	78

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x*b^x*c^x,x,method=_RETURNVERBOSE)
```

```
[Out] a^x*b^x*c^x/(ln(a)+ln(b)+ln(c))
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x*c^x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(log(c)/log(a)+log(b)/log(a)>0)', se
e `assu
```

Fricas [A]
time = 0.36, size = 19, normalized size = 1.00

$$\frac{a^{x} b^{x} c^{x}}{\log\left(a\right) + \log\left(b\right) + \log\left(c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x*c^x,x, algorithm="fricas")
```

```
[Out] a^x*b^x*c^x/(log(a) + log(b) + log(c))
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 49 vs. $2(19) = 38$.
time = 0.60, size = 49, normalized size = 2.58

$$\begin{cases} \frac{a^x b^x c^x}{\log(a)+\log(b)+\log(c)} & \text{for } a \neq \frac{1}{bc} \\ \frac{b^x c^x \left(\frac{1}{bc}\right)^x}{\log(b)+\log(c)+\log\left(\frac{1}{bc}\right)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a**x*b**x*c**x,x)
```

```
[Out] Piecewise((a**x*b**x*c**x/(log(a) + log(b) + log(c)), Ne(a, 1/(b*c))), (b**
x*c**x*(1/(b*c))**x/(log(b) + log(c) + log(1/(b*c))), True))
```

Giac [C] Result contains complex when optimal does not.
time = 4.68, size = 313, normalized size = 16.47

$$2\left(\frac{2\left(\log(|a|)+\log(|b|)+\log(|c|)\right)\cos\left(-\frac{1}{2}\pi x\mathrm{sgn}(a)-\frac{1}{2}\pi x\mathrm{sgn}(b)-\frac{1}{2}\pi x\mathrm{sgn}(c)+\frac{3}{2}\pi x\right)}{\left(3\pi-\pi\mathrm{sgn}(a)-\pi\mathrm{sgn}(b)-\pi\mathrm{sgn}(c)\right)^2+4\left(\log(|a|)+\log(|b|)+\log(|c|)\right)^2}+\frac{\left(3\pi-\pi\mathrm{sgn}(a)-\pi\mathrm{sgn}(b)-\pi\mathrm{sgn}(c)\right)\sin\left(-\frac{1}{2}\pi x\mathrm{sgn}(a)-\frac{1}{2}\pi x\mathrm{sgn}(b)-\frac{1}{2}\pi x\mathrm{sgn}(c)+\frac{3}{2}\pi x\right)}{\left(3\pi-\pi\mathrm{sgn}(a)-\pi\mathrm{sgn}(b)-\pi\mathrm{sgn}(c)\right)^2+4\left(\log(|a|)+\log(|b|)+\log(|c|)\right)^2}\right)e^{\left(x\left(\log(|a|)+\log(|b|)+\log(|c|)\right)\right)}+i\left(\frac{ie^{\left(\frac{1}{2}i\pi x\mathrm{sgn}(a)+\frac{1}{2}i\pi x\mathrm{sgn}(b)+\frac{1}{2}i\pi x\mathrm{sgn}(c)-\frac{3}{2}i\pi x\right)}}{-3i\pi+i\pi\mathrm{sgn}(a)+i\pi\mathrm{sgn}(b)+i\pi\mathrm{sgn}(c)+2\log(|a|)+2\log(|b|)+2\log(|c|)}-\frac{ie^{\left(-\frac{1}{2}i\pi x\mathrm{sgn}(a)-\frac{1}{2}i\pi x\mathrm{sgn}(b)-\frac{1}{2}i\pi x\mathrm{sgn}(c)+\frac{3}{2}i\pi x\right)}}{3i\pi-i\pi\mathrm{sgn}(a)-i\pi\mathrm{sgn}(b)-i\pi\mathrm{sgn}(c)+2\log(|a|)+2\log(|b|)+2\log(|c|)}\right)e^{\left(x\left(\log(|a|)+\log(|b|)+\log(|c|)\right)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x*c^x,x, algorithm="giac")
```

```
[Out] 2*(2*(log(abs(a)) + log(abs(b)) + log(abs(c)))*cos(-1/2*pi*x*sgn(a) - 1/2*p
i*x*sgn(b) - 1/2*pi*x*sgn(c) + 3/2*pi*x)/((3*pi - pi*sgn(a) - pi*sgn(b) - p
i*sgn(c))^2 + 4*(log(abs(a)) + log(abs(b)) + log(abs(c)))^2) + (3*pi - pi*s
gn(a) - pi*sgn(b) - pi*sgn(c))*sin(-1/2*pi*x*sgn(a) - 1/2*pi*x*sgn(b) - 1/2
*pi*x*sgn(c) + 3/2*pi*x)/((3*pi - pi*sgn(a) - pi*sgn(b) - pi*sgn(c))^2 + 4*
(log(abs(a)) + log(abs(b)) + log(abs(c)))^2))*e^(x*(log(abs(a)) + log(abs(b
)) + log(abs(c)))) + I*(I*e^(1/2*I*pi*x*sgn(a) + 1/2*I*pi*x*sgn(b) + 1/2*I*
pi*x*sgn(c) - 3/2*I*pi*x)/(-3*I*pi + I*pi*sgn(a) + I*pi*sgn(b) + I*pi*sgn(c
) + 2*log(abs(a)) + 2*log(abs(b)) + 2*log(abs(c))) - I*e^(-1/2*I*pi*x*sgn(a
) - 1/2*I*pi*x*sgn(b) - 1/2*I*pi*x*sgn(c) + 3/2*I*pi*x)/(3*I*pi - I*pi*sgn(
a) - I*pi*sgn(b) - I*pi*sgn(c) + 2*log(abs(a)) + 2*log(abs(b)) + 2*log(abs(
c))))*e^(x*(log(abs(a)) + log(abs(b)) + log(abs(c))))
```

Mupad [B]
time = 3.51, size = 19, normalized size = 1.00

$$\frac{a^x\,b^x\,c^x}{\ln(a)+\ln(b)+\ln(c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x*b^x*c^x,x)
```

```
[Out] (a^x*b^x*c^x)/(log(a) + log(b) + log(c))
```

3.570 $\int a^x b^{-x}\,dx$

Optimal. Leaf size=18

$$\frac{a^x b^{-x}}{\log(a)-\log(b)}$$

```
[Out] a^x/(b^x)/(ln(a)-ln(b))
```

Rubi [A]
time = 0.01, antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {2325, 2225}

$$\frac{a^x b^{-x}}{\log(a)-\log(b)}$$

Antiderivative was successfully verified.

```
[In] Int[a^x/b^x,x]
```

```
[Out] a^x/(b^x*(Log[a] - Log[b]))
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2325

```
Int[(u_.)*(F_)^(v_)*(G_)^(w_), x_Symbol] :> With[{z = v*Log[F] + w*Log[G]},
 Int[u*NormalizeIntegrand[E^z, x], x] /; BinomialQ[z, x] || (PolynomialQ[z,
 x] && LeQ[Exponent[z, x], 2])] /; FreeQ[{F, G}, x]
```

Rubi steps

$$\begin{aligned}\int a^x b^{-x}\,dx &= \int e^{x(\log(a)-\log(b))}\,dx\\ &= \frac{a^x b^{-x}}{\log(a)-\log(b)}\end{aligned}$$

Mathematica [A]
time = 0.02, size = 18, normalized size = 1.00

$$\frac{a^x b^{-x}}{\log(a)-\log(b)}$$

Antiderivative was successfully verified.

```
[In] Integrate[a^x/b^x,x]
```

```
[Out] a^x/(b^x*(Log[a] - Log[b]))
```

Maple [A]
time = 0.02, size = 20, normalized size = 1.11

method	result	size
gosper	$-\frac{a^{x} b^{-x}}{\ln(b)-\ln(a)}$	20
risch	$-\frac{a^{x} b^{-x}}{\ln(b)-\ln(a)}$	20
norman	$-\frac{e^{\ln(a) x} e^{-\ln(b) x}}{\ln(b)-\ln(a)}$	24
meijerg	$-\frac{1-e^{x \ln(a)\left(1-\frac{\ln(b)}{\ln(a)}\right)}}{\ln(a)\left(1-\frac{\ln(b)}{\ln(a)}\right)}$	38

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x/(b^x),x,method=_RETURNVERBOSE)
```

```
[Out] -1/(ln(b)-ln(a))*a^x/(b^x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x/(b^x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(-log(b)/log(a)>0)', see `assume?` f
or more
```

Fricas [A]
time = 0.35, size = 18, normalized size = 1.00

$$\frac{a^{x}}{b^{x}(\log(a)-\log(b))}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x/(b^x),x, algorithm="fricas")
```

```
[Out] a^x/(b^x*(log(a) - log(b)))
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a**x/(b**x),x)
```

```
[Out] Exception raised: TypeError >> Invalid NaN comparison
```

Giac [C] Result contains complex when optimal does not.
time = 2.98, size = 216, normalized size = 12.00

$$2\left(\frac{2\left(\log\left(|a|\right)-\log\left(|b|\right)\right)\cos\left(-\frac{1}{2}\pi x\operatorname{sgn}(a)+\frac{1}{2}\pi x\operatorname{sgn}(b)\right)}{\left(\pi\operatorname{sgn}\left(a\right)-\pi\operatorname{sgn}\left(b\right)\right)^{2}+4\left(\log\left(|a|\right)-\log\left(|b|\right)\right)^{2}}-\frac{\left(\pi\operatorname{sgn}(a)-\pi\operatorname{sgn}(b)\right)\sin\left(-\frac{1}{2}\pi x\operatorname{sgn}(a)+\frac{1}{2}\pi x\operatorname{sgn}(b)\right)}{\left(\pi\operatorname{sgn}\left(a\right)-\pi\operatorname{sgn}\left(b\right)\right)^{2}+4\left(\log\left(|a|\right)-\log\left(|b|\right)\right)^{2}}\right)e^{\left(x\left(\log(|a|)-\log(|b|)\right)\right)}+i\left(\frac{i\,e^{\left(\frac{1}{2}i\,\pi x\operatorname{sgn}(a)-\frac{1}{2}i\,\pi x\operatorname{sgn}(b)\right)}}{i\,\pi\operatorname{sgn}\left(a\right)-i\,\pi\operatorname{sgn}\left(b\right)+2\,\log\left(|a|\right)-2\,\log\left(|b|\right)}-\frac{i\,e^{\left(-\frac{1}{2}i\,\pi x\operatorname{sgn}(a)+\frac{1}{2}i\,\pi x\operatorname{sgn}(b)\right)}}{-i\,\pi\operatorname{sgn}\left(a\right)+i\,\pi\operatorname{sgn}\left(b\right)+2\,\log\left(|a|\right)-2\,\log\left(|b|\right)}\right)e^{\left(x\left(\log(|a|)-\log(|b|)\right)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x/(b^x),x, algorithm="giac")
```

```
[Out] 2*(2*(log(abs(a)) - log(abs(b)))*cos(-1/2*pi*x*sgn(a) + 1/2*pi*x*sgn(b))/((
pi*sgn(a) - pi*sgn(b))^2 + 4*(log(abs(a)) - log(abs(b)))^2) - (pi*sgn(a) -
pi*sgn(b))*sin(-1/2*pi*x*sgn(a) + 1/2*pi*x*sgn(b))/((pi*sgn(a) - pi*sgn(b))
^2 + 4*(log(abs(a)) - log(abs(b)))^2))*e^(x*(log(abs(a)) - log(abs(b)))) +
I*(I*e^(1/2*I*pi*x*sgn(a) - 1/2*I*pi*x*sgn(b))/(I*pi*sgn(a) - I*pi*sgn(b) +
 2*log(abs(a)) - 2*log(abs(b))) - I*e^(-1/2*I*pi*x*sgn(a) + 1/2*I*pi*x*sgn(
b))/(-I*pi*sgn(a) + I*pi*sgn(b) + 2*log(abs(a)) - 2*log(abs(b))))*e^(x*(log
(abs(a)) - log(abs(b))))
```

Mupad [B]
time = 3.58, size = 18, normalized size = 1.00

$$\frac{a^x}{b^x\,\left(\ln\left(a\right)-\ln\left(b\right)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x/b^x,x)
```

```
[Out] a^x/(b^x*(log(a) - log(b)))
```

3.571 $\int a^x b^{-x} x^2 \, dx$

Optimal. Leaf size=61

$$\frac{2a^x b^{-x}}{(\log(a)-\log(b))^3} - \frac{2a^x b^{-x} x}{(\log(a)-\log(b))^2} + \frac{a^x b^{-x} x^2}{\log(a)-\log(b)}$$

```
[Out] 2*a^x/(b^x)/(ln(a)-ln(b))^3-2*a^x*x/(b^x)/(ln(a)-ln(b))^2+a^x*x^2/(b^x)/(ln
(a)-ln(b))
```

Rubi [A]
time = 0.05, antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.250$, Rules used = {2325, 2207, 2225}

$$\frac{x^2 a^x b^{-x}}{\log(a)-\log(b)} - \frac{2x a^x b^{-x}}{(\log(a)-\log(b))^2} + \frac{2a^x b^{-x}}{(\log(a)-\log(b))^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a^x*x^2)/b^x,x]
```

```
[Out] (2*a^x)/(b^x*(Log[a] - Log[b])^3) - (2*a^x*x)/(b^x*(Log[a] - Log[b])^2) + (
a^x*x^2)/(b^x*(Log[a] - Log[b]))
```

Rule 2207

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[(c + d*x)^m*((b*F^(g*(e + f*x)))^n/(f*g*n*Log[F])),
x] - Dist[d*(m/(f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !TrueQ[$UseGamma]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2325

```
Int[(u_.)*(F_)^(v_)*(G_)^(w_), x_Symbol] :> With[{z = v*Log[F] + w*Log[G]},
 Int[u*NormalizeIntegrand[E^z, x], x] /; BinomialQ[z, x] || (PolynomialQ[z,
 x] && LeQ[Exponent[z, x], 2])] /; FreeQ[{F, G}, x]
```

Rubi steps

$$
\begin{aligned}
\int a^x b^{-x} x^2\,dx &= \int e^{x(\log(a)-\log(b))} x^2\,dx \\
&= \frac{a^x b^{-x} x^2}{\log(a)-\log(b)} - \frac{2\int e^{x(\log(a)-\log(b))} x\,dx}{\log(a)-\log(b)} \\
&= -\frac{2a^x b^{-x} x}{(\log(a)-\log(b))^2} + \frac{a^x b^{-x} x^2}{\log(a)-\log(b)} + \frac{2\int e^{x(\log(a)-\log(b))}\,dx}{(\log(a)-\log(b))^2} \\
&= \frac{2a^x b^{-x}}{(\log(a)-\log(b))^3} - \frac{2a^x b^{-x} x}{(\log(a)-\log(b))^2} + \frac{a^x b^{-x} x^2}{\log(a)-\log(b)}
\end{aligned}
$$

Mathematica [A]
time = 0.03, size = 43, normalized size = 0.70

$$\frac{a^x b^{-x}(2-2x(\log(a)-\log(b))+x^2(\log(a)-\log(b))^2)}{(\log(a)-\log(b))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a^x*x^2)/b^x,x]
```

```
[Out] (a^x*(2 - 2*x*(Log[a] - Log[b]) + x^2*(Log[a] - Log[b])^2))/(b^x*(Log[a] - Log[b])^3)
```

Maple [A]
time = 0.02, size = 56, normalized size = 0.92

method	result	size
risch	$\frac{\left(\ln(a)^2x^2-2\ln(b)\ln(a)x^2+\ln(b)^2x^2-2\ln(a)x+2\ln(b)x+2\right)a^x b^{-x}}{(\ln(a)-\ln(b))^3}$	56
gosper	$\frac{\left(\ln(a)^2x^2-2\ln(b)\ln(a)x^2+\ln(b)^2x^2-2\ln(a)x+2\ln(b)x+2\right)a^x b^{-x}}{(\ln(a)-\ln(b))\left(\ln(a)^2-2\ln(b)\ln(a)+\ln(b)^2\right)}$	73
meijerg	$-\frac{2-\frac{\left(3x^2\ln(a)^2\left(1-\frac{\ln(b)}{\ln(a)}\right)^2-6x\ln(a)\left(1-\frac{\ln(b)}{\ln(a)}\right)+6\right)e^{x\ln(a)\left(1-\frac{\ln(b)}{\ln(a)}\right)}}{3}}{\ln(a)^3\left(1-\frac{\ln(b)}{\ln(a)}\right)^3}$	76
norman	$\left(\frac{x^2 e^{\ln(a)x}}{\ln(a)-\ln(b)}-\frac{2x\,e^{\ln(a)x}}{\ln(a)^2-2\ln(b)\ln(a)+\ln(b)^2}+\frac{2\,e^{\ln(a)x}}{\left(\ln(a)^2-2\ln(b)\ln(a)+\ln(b)^2\right)(\ln(a)-\ln(b))}\right)e^{-\ln(b)x}$	86

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x*x^2/(b^x),x,method=_RETURNVERBOSE)
```

```
[Out] (ln(a)^2*x^2-2*ln(b)*ln(a)*x^2+ln(b)^2*x^2-2*ln(a)*x+2*ln(b)*x+2)*a^x/(ln(a)-ln(b))^3/(b^x)
```

Maxima [A]
time = 0.28, size = 72, normalized size = 1.18

$$\frac{\left(\left(\log\left(a\right)^{2}-2\,\log\left(a\right)\log\left(b\right)+\log\left(b\right)^{2}\right)x^{2}-2\,x\left(\log\left(a\right)-\log\left(b\right)\right)+2\right)e^{\left(x\log\left(a\right)-x\log\left(b\right)\right)}}{\log\left(a\right)^{3}-3\,\log\left(a\right)^{2}\log\left(b\right)+3\,\log\left(a\right)\log\left(b\right)^{2}-\log\left(b\right)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*x^2/(b^x),x, algorithm="maxima")
```

```
[Out] ((log(a)^2 - 2*log(a)*log(b) + log(b)^2)*x^2 - 2*x*(log(a) - log(b)) + 2)*e
^(x*log(a) - x*log(b))/(log(a)^3 - 3*log(a)^2*log(b) + 3*log(a)*log(b)^2 -
log(b)^3)
```

Fricas [A]
time = 0.38, size = 75, normalized size = 1.23

$$\frac{\left(x^{2}\log\left(a\right)^{2}+x^{2}\log\left(b\right)^{2}-2\,x\log\left(a\right)-2\,\left(x^{2}\log\left(a\right)-x\right)\log\left(b\right)+2\right)a^{x}}{\left(\log\left(a\right)^{3}-3\,\log\left(a\right)^{2}\log\left(b\right)+3\,\log\left(a\right)\log\left(b\right)^{2}-\log\left(b\right)^{3}\right)b^{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*x^2/(b^x),x, algorithm="fricas")
```

```
[Out] (x^2*log(a)^2 + x^2*log(b)^2 - 2*x*log(a) - 2*(x^2*log(a) - x)*log(b) + 2)*
a^x/((log(a)^3 - 3*log(a)^2*log(b) + 3*log(a)*log(b)^2 - log(b)^3)*b^x)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 333 vs. $2(51) = 102$.
time = 0.43, size = 333, normalized size = 5.46

$$\begin{cases}\frac{a^{x}x^{2}\log\left(a\right)^{2}}{b^{x}\log\left(a\right)^{3}-3b^{x}\log\left(a\right)^{2}\log\left(b\right)+3b^{x}\log\left(a\right)\log\left(b\right)^{2}-b^{x}\log\left(b\right)^{3}}-\frac{2a^{x}x^{2}\log\left(a\right)\log\left(b\right)}{b^{x}\log\left(a\right)^{3}-3b^{x}\log\left(a\right)^{2}\log\left(b\right)+3b^{x}\log\left(a\right)\log\left(b\right)^{2}-b^{x}\log\left(b\right)^{3}}+\frac{a^{x}x^{2}\log\left(b\right)^{2}}{b^{x}\log\left(a\right)^{3}-3b^{x}\log\left(a\right)^{2}\log\left(b\right)+3b^{x}\log\left(a\right)\log\left(b\right)^{2}-b^{x}\log\left(b\right)^{3}}-\frac{2a^{x}x\log\left(a\right)}{b^{x}\log\left(a\right)^{3}-3b^{x}\log\left(a\right)^{2}\log\left(b\right)+3b^{x}\log\left(a\right)\log\left(b\right)^{2}-b^{x}\log\left(b\right)^{3}}+\frac{2a^{x}x\log\left(b\right)}{b^{x}\log\left(a\right)^{3}-3b^{x}\log\left(a\right)^{2}\log\left(b\right)+3b^{x}\log\left(a\right)\log\left(b\right)^{2}-b^{x}\log\left(b\right)^{3}}+\frac{2a^{x}}{b^{x}\log\left(a\right)^{3}-3b^{x}\log\left(a\right)^{2}\log\left(b\right)+3b^{x}\log\left(a\right)\log\left(b\right)^{2}-b^{x}\log\left(b\right)^{3}} & \text{for}\: a \neq b \\\frac{x^{3}}{3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a**x*x**2/(b**x),x)
```

```
[Out] Piecewise((a**x*x**2*log(a)**2/(b**x*log(a)**3 - 3*b**x*log(a)**2*log(b) +
3*b**x*log(a)*log(b)**2 - b**x*log(b)**3) - 2*a**x*x**2*log(a)*log(b)/(b**x
*log(a)**3 - 3*b**x*log(a)**2*log(b) + 3*b**x*log(a)*log(b)**2 - b**x*log(b
)**3) + a**x*x**2*log(b)**2/(b**x*log(a)**3 - 3*b**x*log(a)**2*log(b) + 3*b
**x*log(a)*log(b)**2 - b**x*log(b)**3) - 2*a**x*x*log(a)/(b**x*log(a)**3 -
3*b**x*log(a)**2*log(b) + 3*b**x*log(a)*log(b)**2 - b**x*log(b)**3) + 2*a**
x*x*log(b)/(b**x*log(a)**3 - 3*b**x*log(a)**2*log(b) + 3*b**x*log(a)*log(b)
**2 - b**x*log(b)**3) + 2*a**x/(b**x*log(a)**3 - 3*b**x*log(a)**2*log(b) +
3*b**x*log(a)*log(b)**2 - b**x*log(b)**3), Ne(a, b)), (x**3/3, True))
```

Giac [C] Result contains complex when optimal does not.
time = 5.37, size = 1817, normalized size = 29.79

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(a^x*x^2/(b^x),x, algorithm="giac")

```
[Out] (((pi^2*x^2*sgn(a)*sgn(b) - pi^2*x^2 + 2*x^2*log(abs(a))^2 - 4*x^2*log(abs(
a))*log(abs(b)) + 2*x^2*log(abs(b))^2 - 4*x*log(abs(a)) + 4*x*log(abs(b)) +
 4)*(3*pi^2*log(abs(a))*sgn(a)*sgn(b) - 3*pi^2*log(abs(b))*sgn(a)*sgn(b) -
3*pi^2*log(abs(a)) + 2*log(abs(a))^3 + 3*pi^2*log(abs(b)) - 6*log(abs(a))^2
*log(abs(b)) + 6*log(abs(a))*log(abs(b))^2 - 2*log(abs(b))^3)/((3*pi^2*log(
abs(a))*sgn(a)*sgn(b) - 3*pi^2*log(abs(b))*sgn(a)*sgn(b) - 3*pi^2*log(abs(a
)) + 2*log(abs(a))^3 + 3*pi^2*log(abs(b)) - 6*log(abs(a))^2*log(abs(b)) + 6
*log(abs(a))*log(abs(b))^2 - 2*log(abs(b))^3)^2 + (pi^3*sgn(a) - 3*pi*log(a
bs(a))^2*sgn(a) + 6*pi*log(abs(a))*log(abs(b))*sgn(a) - 3*pi*log(abs(b))^2*
sgn(a) - pi^3*sgn(b) + 3*pi*log(abs(a))^2*sgn(b) - 6*pi*log(abs(a))*log(abs
(b))*sgn(b) + 3*pi*log(abs(b))^2*sgn(b))^2) - 2*(pi*x^2*log(abs(a))*sgn(a)
- pi*x^2*log(abs(b))*sgn(a) - pi*x^2*log(abs(a))*sgn(b) + pi*x^2*log(abs(b)
)*sgn(b) - pi*x*sgn(a) + pi*x*sgn(b))*(pi^3*sgn(a) - 3*pi*log(abs(a))^2*sgn
(a) + 6*pi*log(abs(a))*log(abs(b))*sgn(a) - 3*pi*log(abs(b))^2*sgn(a) - pi^
3*sgn(b) + 3*pi*log(abs(a))^2*sgn(b) - 6*pi*log(abs(a))*log(abs(b))*sgn(b)
+ 3*pi*log(abs(b))^2*sgn(b))/((3*pi^2*log(abs(a))*sgn(a)*sgn(b) - 3*pi^2*lo
g(abs(b))*sgn(a)*sgn(b) - 3*pi^2*log(abs(a)) + 2*log(abs(a))^3 + 3*pi^2*log
(abs(b)) - 6*log(abs(a))^2*log(abs(b)) + 6*log(abs(a))*log(abs(b))^2 - 2*lo
g(abs(b))^3)^2 + (pi^3*sgn(a) - 3*pi*log(abs(a))^2*sgn(a) + 6*pi*log(abs(a)
)*log(abs(b))*sgn(a) - 3*pi*log(abs(b))^2*sgn(a) - pi^3*sgn(b) + 3*pi*log(a
bs(a))^2*sgn(b) - 6*pi*log(abs(a))*log(abs(b))*sgn(b) + 3*pi*log(abs(b))^2*
sgn(b))^2))*cos(-1/2*pi*x*sgn(a) + 1/2*pi*x*sgn(b)) + (2*(pi*x^2*log(abs(a)
)*sgn(a) - pi*x^2*log(abs(b))*sgn(a) - pi*x^2*log(abs(a))*sgn(b) + pi*x^2*l
og(abs(b))*sgn(b) - pi*x*sgn(a) + pi*x*sgn(b))*(3*pi^2*log(abs(a))*sgn(a)*s
gn(b) - 3*pi^2*log(abs(b))*sgn(a)*sgn(b) - 3*pi^2*log(abs(a)) + 2*log(abs(a
))^3 + 3*pi^2*log(abs(b)) - 6*log(abs(a))^2*log(abs(b)) + 6*log(abs(a))*log
(abs(b))^2 - 2*log(abs(b))^3)/((3*pi^2*log(abs(a))*sgn(a)*sgn(b) - 3*pi^2*l
og(abs(b))*sgn(a)*sgn(b) - 3*pi^2*log(abs(a)) + 2*log(abs(a))^3 + 3*pi^2*lo
g(abs(b)) - 6*log(abs(a))^2*log(abs(b)) + 6*log(abs(a))*log(abs(b))^2 - 2*l
og(abs(b))^3)^2 + (pi^3*sgn(a) - 3*pi*log(abs(a))^2*sgn(a) + 6*pi*log(abs(a
))*log(abs(b))*sgn(a) - 3*pi*log(abs(b))^2*sgn(a) - pi^3*sgn(b) + 3*pi*log(
abs(a))^2*sgn(b) - 6*pi*log(abs(a))*log(abs(b))*sgn(b) + 3*pi*log(abs(b))^2
*sgn(b))^2) + (pi^2*x^2*sgn(a)*sgn(b) - pi^2*x^2 + 2*x^2*log(abs(a))^2 - 4*
x^2*log(abs(a))*log(abs(b)) + 2*x^2*log(abs(b))^2 - 4*x*log(abs(a)) + 4*x*l
og(abs(b)) + 4)*(pi^3*sgn(a) - 3*pi*log(abs(a))^2*sgn(a) + 6*pi*log(abs(a))
*log(abs(b))*sgn(a) - 3*pi*log(abs(b))^2*sgn(a) - pi^3*sgn(b) + 3*pi*log(ab
s(a))^2*sgn(b) - 6*pi*log(abs(a))*log(abs(b))*sgn(b) + 3*pi*log(abs(b))^2*s
gn(b))/((3*pi^2*log(abs(a))*sgn(a)*sgn(b) - 3*pi^2*log(abs(b))*sgn(a)*sgn(b
) - 3*pi^2*log(abs(a)) + 2*log(abs(a))^3 + 3*pi^2*log(abs(b)) - 6*log(abs(a
))^2*log(abs(b)) + 6*log(abs(a))*log(abs(b))^2 - 2*log(abs(b))^3)^2 + (pi^3
*sgn(a) - 3*pi*log(abs(a))^2*sgn(a) + 6*pi*log(abs(a))*log(abs(b))*sgn(a) -
```

```
3*pi*log(abs(b))^2*sgn(a) - pi^3*sgn(b) + 3*pi*log(abs(a))^2*sgn(b) - 6*pi
*log(abs(a))*log(abs(b))*sgn(b) + 3*pi*log(abs(b))^2*sgn(b))^2))*sin(-1/2*p
i*x*sgn(a) + 1/2*pi*x*sgn(b)))*e^(x*(log(abs(a)) - log(abs(b)))) - 1/2*I*((
-I*pi^2*x^2*sgn(a)*sgn(b) + 2*pi*x^2*log(abs(a))*sgn(a) - 2*pi*x^2*log(abs(
b))*sgn(a) - 2*pi*x^2*log(abs(a))*sgn(b) + 2*pi*x^2*log(abs(b))*sgn(b) + I*
pi^2*x^2 - 2*I*x^2*log(abs(a))^2 + 4*I*x^2*log(abs(a))*log(abs(b)) - 2*I*x^
2*log(abs(b))^2 - 2*pi*x*sgn(a) + 2*pi*x*sgn(b) + 4*I*x*log(abs(a)) - 4*I*x
*log(abs(b)) - 4*I)*e^(1/2*I*pi*x*sgn(a) - 1/2*I*pi*x*sgn(b))/(3*pi^2*log(a
bs(a))*sgn(a)*sgn(b) - 3*pi^2*log(abs(b))*sgn(a)*sgn(b) - I*pi^3*sgn(a) + 3
*I*pi*log(abs(a))^2*sgn(a) - 6*I*pi*log(abs(a))*log(abs(b))*sgn(a) + 3*I*pi
*log(abs(b))^2*sgn(a) + I*pi^3*sgn(b) - 3*I*pi*log(abs(a))^2*sgn(b) + 6*I*p
i*log(abs(a))*log(abs(b))*sgn(b) - 3*I*pi*log(abs(b))^2*sgn(b) - 3*pi^2*log
(abs(a)) + 2*log(abs(a))^3 + 3*pi^2*log(abs(b)) - 6*log(abs(a))^2*log(abs(b
)) + 6*log(abs(a))*log(abs(b))^2 - 2*log(abs(b))^3) - (-I*pi^2*x^2*sgn(a)*s
gn(b) - 2*pi*x^2*log(abs(a))*sgn(a) + 2*pi*x^2*log(abs(b))*sgn(a) + 2*pi*x^
2*log(abs(a))*sgn(b) - 2*pi*x^2*log(abs(b))*sgn(b) + I*pi^2*x^2 - 2*I*x^2*l
og(abs(a))^2 + 4*I*x^2*log(abs(a))*log(abs(b)) - 2*I*x^2*log(abs(b))^2 + 2*
pi*x*sgn(a) - 2*pi*x*sgn(b) + 4*I*x*log(abs(a)) - 4*I*x*log(abs(b)) - 4*I)*
e^(-1/2*I*pi*x*sgn(a) + 1/2*I*pi*x*sgn(b))/(3*pi^2*log(abs(a))*sgn(a)*sgn(b
) - 3*pi^2*log(abs(b))*sgn(a)*sgn(b) + I*pi^3*sgn(a) - 3*I*pi*log(abs(a))^2
*sgn(a) + 6*I*pi*log(abs(a))*log(abs(b))*sgn(a) - 3*I*pi*log(abs(b))^2*sgn(
a) - I*pi^3*sgn(b) + 3*I*pi*log(abs(a))^2*sgn(b) - 6*I*pi*log(abs(a))*log(a
bs(b))*sgn(b) + 3*I*pi*log(abs(b))^2*sgn(b) - 3*pi^2*log(abs(a)) + 2*log(ab
s(a))^3 + 3*pi^2*log(abs(b)) - 6*log(abs(a))^2*log(abs(b)) + 6*log(abs(a))*
log(abs(b))^2 - 2*log(abs(b))^3))*e^(x*(log(abs(a)) - log(abs(b))))
```

Mupad [B]
time = 3.56, size = 43, normalized size = 0.70

$$\frac{a^x\,\left(x^2\,{\left(\ln\left(a\right)-\ln\left(b\right)\right)}^2-2\,x\,\left(\ln\left(a\right)-\ln\left(b\right)\right)+2\right)}{b^x\,{\left(\ln\left(a\right)-\ln\left(b\right)\right)}^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^x*x^2)/b^x,x)
```

```
[Out] (a^x*(x^2*(log(a) - log(b))^2 - 2*x*(log(a) - log(b)) + 2))/(b^x*(log(a) -
log(b))^3)
```

3.572 $\int \frac{\left(d+ee^{h+ix}\right)(f+gx)^3}{a+be^{h+ix}+ce^{2h+2ix}}\,dx$

Optimal. Leaf size=770

$$\frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3\log\Big(1+\frac{2ce}{b-\sqrt{b^2}}}{\left(b-\sqrt{b^2-4ac}\right)i}$$

```
[Out] 1/4*(g*x+f)^4*(e+(-b*e+2*c*d)/(-4*a*c+b^2)^(1/2))/g/(b-(-4*a*c+b^2)^(1/2))-
(g*x+f)^3*ln(1+2*c*exp(i*x+h)/(b-(-4*a*c+b^2)^(1/2)))*(e+(-b*e+2*c*d)/(-4*a
*c+b^2)^(1/2))/i/(b-(-4*a*c+b^2)^(1/2))-3*g*(g*x+f)^2*polylog(2,-2*c*exp(i*
x+h)/(b-(-4*a*c+b^2)^(1/2)))*(e+(-b*e+2*c*d)/(-4*a*c+b^2)^(1/2))/i^2/(b-(-4
*a*c+b^2)^(1/2))+6*g^2*(g*x+f)*polylog(3,-2*c*exp(i*x+h)/(b-(-4*a*c+b^2)^(1
/2)))*(e+(-b*e+2*c*d)/(-4*a*c+b^2)^(1/2))/i^3/(b-(-4*a*c+b^2)^(1/2))-6*g^3*
polylog(4,-2*c*exp(i*x+h)/(b-(-4*a*c+b^2)^(1/2)))*(e+(-b*e+2*c*d)/(-4*a*c+b
^2)^(1/2))/i^4/(b-(-4*a*c+b^2)^(1/2))+1/4*(g*x+f)^4*(e+(b*e-2*c*d)/(-4*a*c+
b^2)^(1/2))/g/(b+(-4*a*c+b^2)^(1/2))-(g*x+f)^3*ln(1+2*c*exp(i*x+h)/(b+(-4*a
*c+b^2)^(1/2)))*(e+(b*e-2*c*d)/(-4*a*c+b^2)^(1/2))/i/(b+(-4*a*c+b^2)^(1/2))
-3*g*(g*x+f)^2*polylog(2,-2*c*exp(i*x+h)/(b+(-4*a*c+b^2)^(1/2)))*(e+(b*e-2*
c*d)/(-4*a*c+b^2)^(1/2))/i^2/(b+(-4*a*c+b^2)^(1/2))+6*g^2*(g*x+f)*polylog(3
,-2*c*exp(i*x+h)/(b+(-4*a*c+b^2)^(1/2)))*(e+(b*e-2*c*d)/(-4*a*c+b^2)^(1/2))
/i^3/(b+(-4*a*c+b^2)^(1/2))-6*g^3*polylog(4,-2*c*exp(i*x+h)/(b+(-4*a*c+b^2)
^(1/2)))*(e+(b*e-2*c*d)/(-4*a*c+b^2)^(1/2))/i^4/(b+(-4*a*c+b^2)^(1/2))
```

Rubi [A]

time = 0.94, antiderivative size = 770, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 7, integrand size = 44, $\frac{\text{number of rules}}{\text{integrand size}} = 0.159$, Rules used = {2297, 2215, 2221, 2611, 6744, 2320, 6724}

$$\frac{6g^2(f+gx)\left(\frac{2cd-be}{\sqrt{b^2-4ac}}+e\right)\text{PolyLog}\left(3,-\frac{2ce^{h+ix}}{b-\sqrt{b^2-4ac}}\right)}{i^3\left(b-\sqrt{b^2-4ac}\right)}+\frac{6g^2(f+gx)\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\text{PolyLog}\left(3,-\frac{2ce^{h+ix}}{\sqrt{b^2-4ac}+b}\right)}{i^3\left(\sqrt{b^2-4ac}+b\right)}-\frac{3g(f+gx)^2\left(\frac{2cd-be}{\sqrt{b^2-4ac}}+e\right)\text{PolyLog}\left(2,-\frac{2ce^{h+ix}}{b-\sqrt{b^2-4ac}}\right)}{i^2\left(b-\sqrt{b^2-4ac}\right)}-\frac{3g(f+gx)^2\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\text{PolyLog}\left(2,-\frac{2ce^{h+ix}}{\sqrt{b^2-4ac}+b}\right)}{i^2\left(\sqrt{b^2-4ac}+b\right)}-\frac{6g^3\left(\frac{2cd-be}{\sqrt{b^2-4ac}}+e\right)\text{PolyLog}\left(4,-\frac{2ce^{h+ix}}{b-\sqrt{b^2-4ac}}\right)}{i^4\left(b-\sqrt{b^2-4ac}\right)}-\frac{6g^3\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\text{PolyLog}\left(4,-\frac{2ce^{h+ix}}{\sqrt{b^2-4ac}+b}\right)}{i^4\left(\sqrt{b^2-4ac}+b\right)}-\frac{(f+gx)^3\left(\frac{2cd-be}{\sqrt{b^2-4ac}}+e\right)\log\left(\frac{2ce^{h+ix}}{b-\sqrt{b^2-4ac}}+1\right)}{i\left(b-\sqrt{b^2-4ac}\right)}-\frac{(f+gx)^3\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\log\left(\frac{2ce^{h+ix}}{\sqrt{b^2-4ac}+b}+1\right)}{i\left(\sqrt{b^2-4ac}+b\right)}+\frac{(f+gx)^4\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)}{4g\left(\sqrt{b^2-4ac}+b\right)}+\frac{(f+gx)^4\left(\frac{2cd-be}{\sqrt{b^2-4ac}}+e\right)}{4g\left(b-\sqrt{b^2-4ac}\right)}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*E^(h + i*x))*(f + g*x)^3)/(a + b*E^(h + i*x) + c*E^(2*h + 2*i*x
)),x]
```

```
[Out] ((e - (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*(f + g*x)^4)/(4*(b + Sqrt[b^2 - 4*a*
c])*g) + ((e + (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*(f + g*x)^4)/(4*(b - Sqrt[b
^2 - 4*a*c])*g) - ((e + (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*(f + g*x)^3*Log[1
+ (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])])/((b - Sqrt[b^2 - 4*a*c])*i) -
 ((e - (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*(f + g*x)^3*Log[1 + (2*c*E^(h + i*x
))/(b + Sqrt[b^2 - 4*a*c])])/((b + Sqrt[b^2 - 4*a*c])*i) - (3*(e + (2*c*d -
 b*e)/Sqrt[b^2 - 4*a*c])*g*(f + g*x)^2*PolyLog[2, (-2*c*E^(h + i*x))/(b - S
qrt[b^2 - 4*a*c])])/((b - Sqrt[b^2 - 4*a*c])*i^2) - (3*(e - (2*c*d - b*e)/S
```

```
qrt[b^2 - 4*a*c])*g*(f + g*x)^2*PolyLog[2, (-2*c*E^(h + i*x))/(b + Sqrt[b^2
 - 4*a*c])])/((b + Sqrt[b^2 - 4*a*c])*i^2) + (6*(e + (2*c*d - b*e)/Sqrt[b^2
 - 4*a*c])*g^2*(f + g*x)*PolyLog[3, (-2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*
c])])/((b - Sqrt[b^2 - 4*a*c])*i^3) + (6*(e - (2*c*d - b*e)/Sqrt[b^2 - 4*a*
c])*g^2*(f + g*x)*PolyLog[3, (-2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])])/(
(b + Sqrt[b^2 - 4*a*c])*i^3) - (6*(e + (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*g^3
*PolyLog[4, (-2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])])/((b - Sqrt[b^2 - 4
*a*c])*i^4) - (6*(e - (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*g^3*PolyLog[4, (-2*c
*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])])/((b + Sqrt[b^2 - 4*a*c])*i^4)
```

Rule 2215

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[(c + d*x)^m*((F^(g*(e + f*x)))^n/(a + b*(F^(g*(e + f*x)))^n)), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2297

```
Int[(((i_.)*(F_)^(u_) + (h_))*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F
_)^(u_) + (c_.)*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dis
t[Simplify[(2*c*h - b*i)/q] + i, Int[(f + g*x)^m/(b - q + 2*c*F^u), x], x]
- Dist[Simplify[(2*c*h - b*i)/q] - i, Int[(f + g*x)^m/(b + q + 2*c*F^u), x]
, x]] /; FreeQ[{F, a, b, c, f, g, h, i}, x] && EqQ[v, 2*u] && LinearQ[u, x]
 && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
```

```
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6744

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Dist[f*(m/(b*c*p*Log[F])), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{\left(d+ee^{h+572x}\right)(f+gx)^3}{a+be^{h+572x}+ce^{2h+1144x}}\,dx = -\left(\left(-e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\int \frac{(f+gx)^3}{b+\sqrt{b^2-4ac}+2ce^{h+572x}}\,dx\right)+\left(e+\frac{2c}{\sqrt{b^2}}\right.$$

$$= \frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(2c\left(e\right.\right.}{}$$

$$= \frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(e+\right.}{}$$

$$= \frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(e+\right.}{}$$

$$= \frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(e+\right.}{}$$

$$= \frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(e+\right.}{}$$

$$= \frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(e+\right.}{}$$

Mathematica [**B**] Leaf count is larger than twice the leaf count of optimal. 2448 vs. $2(770) = 1540$.
time = 2.90, size = 2448, normalized size = 3.18

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*E^(h + i*x))*(f + g*x)^3)/(a + b*E^(h + i*x) + c*E^(2*h +
 2*i*x)),x]
```

```
[Out] -1/4*(-6*Sqrt[-(b^2 - 4*a*c)^2]*d*f^2*g*i^4*x^2 - 4*Sqrt[-(b^2 - 4*a*c)^2]*
d*f*g^2*i^4*x^3 - Sqrt[-(b^2 - 4*a*c)^2]*d*g^3*i^4*x^4 + 4*b*Sqrt[b^2 - 4*a
*c]*d*f^3*i^3*ArcTan[(b + 2*c*E^(h + i*x))/Sqrt[-b^2 + 4*a*c]] - 8*a*Sqrt[b
```

```
^2 - 4*a*c]*e*f^3*i^3*ArcTan[(b + 2*c*E^(h + i*x))/Sqrt[-b^2 + 4*a*c]] - 4*
Sqrt[-(b^2 - 4*a*c)^2]*d*f^3*i^3*Log[E^(h + i*x)] + 6*Sqrt[-(b^2 - 4*a*c)^2
]*d*f^2*g*i^3*x*Log[1 + (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])] + 6*b*Sq
rt[-b^2 + 4*a*c]*d*f^2*g*i^3*x*Log[1 + (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*
a*c])] - 12*a*Sqrt[-b^2 + 4*a*c]*e*f^2*g*i^3*x*Log[1 + (2*c*E^(h + i*x))/(b
 - Sqrt[b^2 - 4*a*c])] + 6*Sqrt[-(b^2 - 4*a*c)^2]*d*f*g^2*i^3*x^2*Log[1 + (
2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])] + 6*b*Sqrt[-b^2 + 4*a*c]*d*f*g^2*
i^3*x^2*Log[1 + (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])] - 12*a*Sqrt[-b^2
 + 4*a*c]*e*f*g^2*i^3*x^2*Log[1 + (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])
] + 2*Sqrt[-(b^2 - 4*a*c)^2]*d*g^3*i^3*x^3*Log[1 + (2*c*E^(h + i*x))/(b - S
qrt[b^2 - 4*a*c])] + 2*b*Sqrt[-b^2 + 4*a*c]*d*g^3*i^3*x^3*Log[1 + (2*c*E^(h
 + i*x))/(b - Sqrt[b^2 - 4*a*c])] - 4*a*Sqrt[-b^2 + 4*a*c]*e*g^3*i^3*x^3*Lo
g[1 + (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])] + 6*Sqrt[-(b^2 - 4*a*c)^2]
*d*f^2*g*i^3*x*Log[1 + (2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] - 6*b*Sqr
t[-b^2 + 4*a*c]*d*f^2*g*i^3*x*Log[1 + (2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a
*c])] + 12*a*Sqrt[-b^2 + 4*a*c]*e*f^2*g*i^3*x*Log[1 + (2*c*E^(h + i*x))/(b
+ Sqrt[b^2 - 4*a*c])] + 6*Sqrt[-(b^2 - 4*a*c)^2]*d*f*g^2*i^3*x^2*Log[1 + (2
*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] - 6*b*Sqrt[-b^2 + 4*a*c]*d*f*g^2*i
^3*x^2*Log[1 + (2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] + 12*a*Sqrt[-b^2
+ 4*a*c]*e*f*g^2*i^3*x^2*Log[1 + (2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])]
 + 2*Sqrt[-(b^2 - 4*a*c)^2]*d*g^3*i^3*x^3*Log[1 + (2*c*E^(h + i*x))/(b + Sq
rt[b^2 - 4*a*c])] - 2*b*Sqrt[-b^2 + 4*a*c]*d*g^3*i^3*x^3*Log[1 + (2*c*E^(h
+ i*x))/(b + Sqrt[b^2 - 4*a*c])] + 4*a*Sqrt[-b^2 + 4*a*c]*e*g^3*i^3*x^3*Log
[1 + (2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] + 2*Sqrt[-(b^2 - 4*a*c)^2]*
d*f^3*i^3*Log[a + E^(h + i*x)*(b + c*E^(h + i*x))] + 6*(Sqrt[-(b^2 - 4*a*c)
^2]*d + b*Sqrt[-b^2 + 4*a*c]*d - 2*a*Sqrt[-b^2 + 4*a*c]*e)*g*i^2*(f + g*x)^
2*PolyLog[2, (2*c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c])] + 6*(Sqrt[-(b^2 -
4*a*c)^2]*d - b*Sqrt[-b^2 + 4*a*c]*d + 2*a*Sqrt[-b^2 + 4*a*c]*e)*g*i^2*(f +
 g*x)^2*PolyLog[2, (-2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] - 12*Sqrt[-(
b^2 - 4*a*c)^2]*d*f*g^2*i*PolyLog[3, (2*c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a
*c])] - 12*b*Sqrt[-b^2 + 4*a*c]*d*f*g^2*i*PolyLog[3, (2*c*E^(h + i*x))/(-b
+ Sqrt[b^2 - 4*a*c])] + 24*a*Sqrt[-b^2 + 4*a*c]*e*f*g^2*i*PolyLog[3, (2*c*E
^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c])] - 12*Sqrt[-(b^2 - 4*a*c)^2]*d*g^3*i*x
*PolyLog[3, (2*c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c])] - 12*b*Sqrt[-b^2 +
4*a*c]*d*g^3*i*x*PolyLog[3, (2*c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c])] + 2
4*a*Sqrt[-b^2 + 4*a*c]*e*g^3*i*x*PolyLog[3, (2*c*E^(h + i*x))/(-b + Sqrt[b^
2 - 4*a*c])] - 12*Sqrt[-(b^2 - 4*a*c)^2]*d*f*g^2*i*PolyLog[3, (-2*c*E^(h +
i*x))/(b + Sqrt[b^2 - 4*a*c])] + 12*b*Sqrt[-b^2 + 4*a*c]*d*f*g^2*i*PolyLog[
3, (-2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] - 24*a*Sqrt[-b^2 + 4*a*c]*e*
f*g^2*i*PolyLog[3, (-2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] - 12*Sqrt[-(
b^2 - 4*a*c)^2]*d*g^3*i*x*PolyLog[3, (-2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a
*c])] + 12*b*Sqrt[-b^2 + 4*a*c]*d*g^3*i*x*PolyLog[3, (-2*c*E^(h + i*x))/(b
+ Sqrt[b^2 - 4*a*c])] - 24*a*Sqrt[-b^2 + 4*a*c]*e*g^3*i*x*PolyLog[3, (-2*c*
E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] + 12*Sqrt[-(b^2 - 4*a*c)^2]*d*g^3*Pol
yLog[4, (2*c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c])] + 12*b*Sqrt[-b^2 + 4*a*
```

```
c]*d*g^3*PolyLog[4, (2*c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c])] - 24*a*Sqrt
[-b^2 + 4*a*c]*e*g^3*PolyLog[4, (2*c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c])]
 + 12*Sqrt[-(b^2 - 4*a*c)^2]*d*g^3*PolyLog[4, (-2*c*E^(h + i*x))/(b + Sqrt[
b^2 - 4*a*c])] - 12*b*Sqrt[-b^2 + 4*a*c]*d*g^3*PolyLog[4, (-2*c*E^(h + i*x)
)/(b + Sqrt[b^2 - 4*a*c])] + 24*a*Sqrt[-b^2 + 4*a*c]*e*g^3*PolyLog[4, (-2*c
*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])])/(a*Sqrt[-(b^2 - 4*a*c)^2]*i^4)
```

Maple [F]
time = 0.12, size = 0, normalized size = 0.00

$$\int \frac{\left(d+e\,\mathrm{e}^{ix+h}\right)\left(gx+f\right)^{3}}{a+b\,\mathrm{e}^{ix+h}+c\,\mathrm{e}^{2ix+2h}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*exp(i*x+h))*(g*x+f)^3/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x)
[Out] int((d+e*exp(i*x+h))*(g*x+f)^3/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x)
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))*(g*x+f)^3/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x, a
lgorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re deta
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3031 vs. 2(701) = 1402.
time = 0.51, size = 3031, normalized size = 3.94

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))*(g*x+f)^3/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x, a
lgorithm="fricas")
[Out] -1/4*((b^2 - 4*a*c)*d*g^3*h^4 - (b^2 - 4*a*c)*d*g^3*x^4 - 4*(b^2 - 4*a*c)*d
*f*g^2*x^3 - 6*(b^2 - 4*a*c)*d*f^2*g*x^2 - 4*(b^2 - 4*a*c)*d*f^3*x - 4*(-I*
b^2 + 4*I*a*c)*d*f^3 - 6*(b^2 - 4*a*c)*d*f^2*g - 4*(I*b^2 - 4*I*a*c)*d*f*g^
2 + (b^2 - 4*a*c)*d*g^3 - 4*((I*b^2 - 4*I*a*c)*d*f*g^2 - (b^2 - 4*a*c)*d*g^
```

```
3)*h^3 - 6*((b^2 - 4*a*c)*d*f^2*g + 2*(I*b^2 - 4*I*a*c)*d*f*g^2 - (b^2 - 4*
a*c)*d*g^3)*h^2 - 4*((-I*b^2 + 4*I*a*c)*d*f^3 + 3*(b^2 - 4*a*c)*d*f^2*g + 3
*(I*b^2 - 4*I*a*c)*d*f*g^2 - (b^2 - 4*a*c)*d*g^3)*h - 6*((b^2 - 4*a*c)*d*g^
3*x^2 + 2*(b^2 - 4*a*c)*d*f*g^2*x + (b^2 - 4*a*c)*d*f^2*g - (2*(a^2*g^3*x^2
 + 2*a^2*f*g^2*x + a^2*f^2*g)*e^2 - (a*b*d*g^3*x^2 + 2*a*b*d*f*g^2*x + a*b*
d*f^2*g)*e)*sqrt((b^2 - 4*a*c)/a^2)*e^(-1))*dilog(-1/2*(a*sqrt((b^2 - 4*a*c
)/a^2)*e^(h + I*x + 1) + 2*a*e + b*e^(h + I*x + 1))*e^(-1)/a + 1) - 6*((b^2
 - 4*a*c)*d*g^3*x^2 + 2*(b^2 - 4*a*c)*d*f*g^2*x + (b^2 - 4*a*c)*d*f^2*g + (
2*(a^2*g^3*x^2 + 2*a^2*f*g^2*x + a^2*f^2*g)*e^2 - (a*b*d*g^3*x^2 + 2*a*b*d*
f*g^2*x + a*b*d*f^2*g)*e)*sqrt((b^2 - 4*a*c)/a^2)*e^(-1))*dilog(1/2*(a*sqrt
((b^2 - 4*a*c)/a^2)*e^(h + I*x + 1) - 2*a*e - b*e^(h + I*x + 1))*e^(-1)/a +
 1) + 2*((b^2 - 4*a*c)*d*g^3*h^3 - (I*b^2 - 4*I*a*c)*d*g^3*x^3 - 3*(I*b^2 -
 4*I*a*c)*d*f*g^2*x^2 - 3*(I*b^2 - 4*I*a*c)*d*f^2*g*x - 3*(b^2 - 4*a*c)*d*f
^2*g - 3*(I*b^2 - 4*I*a*c)*d*f*g^2 + (b^2 - 4*a*c)*d*g^3 - 3*((I*b^2 - 4*I*
a*c)*d*f*g^2 - (b^2 - 4*a*c)*d*g^3)*h^2 - (2*(a^2*g^3*h^3 - I*a^2*g^3*x^3 -
 3*I*a^2*f*g^2*x^2 - 3*I*a^2*f^2*g*x - 3*a^2*f^2*g - 3*I*a^2*f*g^2 + a^2*g^
3 + 3*(-I*a^2*f*g^2 + a^2*g^3)*h^2 - 3*(a^2*f^2*g + 2*I*a^2*f*g^2 - a^2*g^3
)*h)*e^2 - (a*b*d*g^3*h^3 - I*a*b*d*g^3*x^3 - 3*I*a*b*d*f*g^2*x^2 - 3*I*a*b
*d*f^2*g*x - 3*a*b*d*f^2*g - 3*I*a*b*d*f*g^2 + a*b*d*g^3 - 3*(I*a*b*d*f*g^2
 - a*b*d*g^3)*h^2 - 3*(a*b*d*f^2*g + 2*I*a*b*d*f*g^2 - a*b*d*g^3)*h)*e)*sqr
t((b^2 - 4*a*c)/a^2)*e^(-1) - 3*((b^2 - 4*a*c)*d*f^2*g + 2*(I*b^2 - 4*I*a*c
)*d*f*g^2 - (b^2 - 4*a*c)*d*g^3)*h)*log(1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^(h
 + I*x + 1) + 2*a*e + b*e^(h + I*x + 1))*e^(-1)/a) + 2*((b^2 - 4*a*c)*d*g^3
*h^3 - (I*b^2 - 4*I*a*c)*d*g^3*x^3 - 3*(I*b^2 - 4*I*a*c)*d*f*g^2*x^2 - 3*(I
*b^2 - 4*I*a*c)*d*f^2*g*x - 3*(b^2 - 4*a*c)*d*f^2*g - 3*(I*b^2 - 4*I*a*c)*d
*f*g^2 + (b^2 - 4*a*c)*d*g^3 - 3*((I*b^2 - 4*I*a*c)*d*f*g^2 - (b^2 - 4*a*c)
*d*g^3)*h^2 + (2*(a^2*g^3*h^3 - I*a^2*g^3*x^3 - 3*I*a^2*f*g^2*x^2 - 3*I*a^2
*f^2*g*x - 3*a^2*f^2*g - 3*I*a^2*f*g^2 + a^2*g^3 - 3*(I*a^2*f*g^2 - a^2*g^3
)*h^2 - 3*(a^2*f^2*g + 2*I*a^2*f*g^2 - a^2*g^3)*h)*e^2 - (a*b*d*g^3*h^3 - I
*a*b*d*g^3*x^3 - 3*I*a*b*d*f*g^2*x^2 - 3*I*a*b*d*f^2*g*x - 3*a*b*d*f^2*g -
3*I*a*b*d*f*g^2 + a*b*d*g^3 + 3*(-I*a*b*d*f*g^2 + a*b*d*g^3)*h^2 - 3*(a*b*d
*f^2*g + 2*I*a*b*d*f*g^2 - a*b*d*g^3)*h)*e)*sqrt((b^2 - 4*a*c)/a^2)*e^(-1)
- 3*((b^2 - 4*a*c)*d*f^2*g + 2*(I*b^2 - 4*I*a*c)*d*f*g^2 - (b^2 - 4*a*c)*d*
g^3)*h)*log(-1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^(h + I*x + 1) - 2*a*e - b*e^(
h + I*x + 1))*e^(-1)/a) - 2*((b^2 - 4*a*c)*d*g^3*h^3 + (I*b^2 - 4*I*a*c)*d*
f^3 - 3*(b^2 - 4*a*c)*d*f^2*g + 3*(-I*b^2 + 4*I*a*c)*d*f*g^2 + (b^2 - 4*a*c
)*d*g^3 + 3*((-I*b^2 + 4*I*a*c)*d*f*g^2 + (b^2 - 4*a*c)*d*g^3)*h^2 + (2*(a^
2*g^3*h^3 + I*a^2*f^3 - 3*a^2*f^2*g - 3*I*a^2*f*g^2 + a^2*g^3 + 3*(-I*a^2*f
*g^2 + a^2*g^3)*h^2 - 3*(a^2*f^2*g + 2*I*a^2*f*g^2 - a^2*g^3)*h)*e^2 - (a*b
*d*g^3*h^3 + I*a*b*d*f^3 - 3*a*b*d*f^2*g - 3*I*a*b*d*f*g^2 + a*b*d*g^3 - 3*
(I*a*b*d*f*g^2 - a*b*d*g^3)*h^2 - 3*(a*b*d*f^2*g + 2*I*a*b*d*f*g^2 - a*b*d*
g^3)*h)*e)*sqrt((b^2 - 4*a*c)/a^2)*e^(-1) - 3*((b^2 - 4*a*c)*d*f^2*g - 2*(-
I*b^2 + 4*I*a*c)*d*f*g^2 - (b^2 - 4*a*c)*d*g^3)*h)*log(1/2*(a*sqrt((b^2 - 4
*a*c)/a^2)*e + b*e + 2*c*e^(h + I*x + 1))/c) - 2*((b^2 - 4*a*c)*d*g^3*h^3 +
 (I*b^2 - 4*I*a*c)*d*f^3 - 3*(b^2 - 4*a*c)*d*f^2*g + 3*(-I*b^2 + 4*I*a*c)*d
```

```
*f*g^2 + (b^2 - 4*a*c)*d*g^3 + 3*((-I*b^2 + 4*I*a*c)*d*f*g^2 + (b^2 - 4*a*c
)*d*g^3)*h^2 - (2*(a^2*g^3*h^3 + I*a^2*f^3 - 3*a^2*f^2*g - 3*I*a^2*f*g^2 +
a^2*g^3 - 3*(I*a^2*f*g^2 - a^2*g^3)*h^2 - 3*(a^2*f^2*g + 2*I*a^2*f*g^2 - a^
2*g^3)*h)*e^2 - (a*b*d*g^3*h^3 + I*a*b*d*f^3 - 3*a*b*d*f^2*g - 3*I*a*b*d*f*
g^2 + a*b*d*g^3 + 3*(-I*a*b*d*f*g^2 + a*b*d*g^3)*h^2 - 3*(a*b*d*f^2*g + 2*I
*a*b*d*f*g^2 - a*b*d*g^3)*h)*e)*sqrt((b^2 - 4*a*c)/a^2)*e^(-1) - 3*((b^2 -
4*a*c)*d*f^2*g - 2*(-I*b^2 + 4*I*a*c)*d*f*g^2 - (b^2 - 4*a*c)*d*g^3)*h)*log
(-1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e - b*e - 2*c*e^(h + I*x + 1))/c) + 12*((b
^2 - 4*a*c)*d*g^3 + (a*b*d*g^3*e - 2*a^2*g^3*e^2)*sqrt((b^2 - 4*a*c)/a^2)*e
^(-1))*polylog(4, -1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^(h + I*x + 1) + b*e^(h
+ I*x + 1))*e^(-1)/a) + 12*((b^2 - 4*a*c)*d*g^3 - (a*b*d*g^3*e - 2*a^2*g^3*
e^2)*sqrt((b^2 - 4*a*c)/a^2)*e^(-1))*polylog(4, 1/2*(a*sqrt((b^2 - 4*a*c)/a
^2)*e^(h + I*x + 1) - b*e^(h + I*x + 1))*e^(-1)/a) - 12*((I*b^2 - 4*I*a*c)*
d*g^3*x + (I*b^2 - 4*I*a*c)*d*f*g^2 + (2*(-I*a^2*g^3*x - I*a^2*f*g^2)*e^2 +
 (I*a*b*d*g^3*x + I*a*b*d*f*g^2)*e)*sqrt((b^2 - 4*a*c)/a^2)*e^(-1))*polylog
(3, -1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^(h + I*x + 1) + b*e^(h + I*x + 1))*e^
(-1)/a) - 12*((I*b^2 - 4*I*a*c)*d*g^3*x + (I*b^2 - 4*I*a*c)*d*f*g^2 + (2*(I
*a^2*g^3*x + I*a^2*f*g^2)*e^2 + (-I*a*b*d*g^3*x...
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d + ee^{h}e^{ix}\right)\left(f + gx\right)^{3}}{a + be^{h}e^{ix} + ce^{2h}e^{2ix}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))*(g*x+f)**3/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x)
```

```
[Out] Integral((d + e*exp(h)*exp(i*x))*(f + g*x)**3/(a + b*exp(h)*exp(i*x) + c*ex
p(2*h)*exp(2*i*x)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))*(g*x+f)^3/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x, a
lgorithm="giac")
```

```
[Out] integrate((g*x + f)^3*(d + e^(h + I*x + 1))/(c*e^(2*h + 2*I*x) + b*e^(h + I
*x) + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(f+g\,x\right)}^3\,\left(d+e\,{\mathrm{e}}^{h+i\,x}\right)}{a+b\,{\mathrm{e}}^{h+i\,x}+c\,{\mathrm{e}}^{2\,h+2\,i\,x}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((f + g*x)^3*(d + e*exp(h + i*x)))/(a + b*exp(h + i*x) + c*exp(2*h + 2*
i*x)),x)
```

```
[Out] int(((f + g*x)^3*(d + e*exp(h + i*x)))/(a + b*exp(h + i*x) + c*exp(2*h + 2*
i*x)), x)
```

3.573 $\int \frac{\left(d+ee^{h+ix}\right)(f+gx)^2}{a+be^{h+ix}+ce^{2h+2ix}}\,dx$

Optimal. Leaf size=599

$$\frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3}{3\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3}{3\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^2\log\left(1+\frac{2\cdots}{b-\sqrt{\cdots}}\right.}{\left(b-\sqrt{b^2-4ac}\right)i}$$

```
[Out] 1/3*(g*x+f)^3*(e+(-b*e+2*c*d)/(-4*a*c+b^2)^(1/2))/g/(b-(-4*a*c+b^2)^(1/2))-
(g*x+f)^2*ln(1+2*c*exp(i*x+h)/(b-(-4*a*c+b^2)^(1/2)))*(e+(-b*e+2*c*d)/(-4*a
*c+b^2)^(1/2))/i/(b-(-4*a*c+b^2)^(1/2))-2*g*(g*x+f)*polylog(2,-2*c*exp(i*x+
h)/(b-(-4*a*c+b^2)^(1/2)))*(e+(-b*e+2*c*d)/(-4*a*c+b^2)^(1/2))/i^2/(b-(-4*a
*c+b^2)^(1/2))+2*g^2*polylog(3,-2*c*exp(i*x+h)/(b-(-4*a*c+b^2)^(1/2)))*(e+(
-b*e+2*c*d)/(-4*a*c+b^2)^(1/2))/i^3/(b-(-4*a*c+b^2)^(1/2))+1/3*(g*x+f)^3*(e
+(b*e-2*c*d)/(-4*a*c+b^2)^(1/2))/g/(b+(-4*a*c+b^2)^(1/2))-(g*x+f)^2*ln(1+2*
c*exp(i*x+h)/(b+(-4*a*c+b^2)^(1/2)))*(e+(b*e-2*c*d)/(-4*a*c+b^2)^(1/2))/i/(
b+(-4*a*c+b^2)^(1/2))-2*g*(g*x+f)*polylog(2,-2*c*exp(i*x+h)/(b+(-4*a*c+b^2)
^(1/2)))*(e+(b*e-2*c*d)/(-4*a*c+b^2)^(1/2))/i^2/(b+(-4*a*c+b^2)^(1/2))+2*g^
2*polylog(3,-2*c*exp(i*x+h)/(b+(-4*a*c+b^2)^(1/2)))*(e+(b*e-2*c*d)/(-4*a*c+
b^2)^(1/2))/i^3/(b+(-4*a*c+b^2)^(1/2))
```

Rubi [A]

time = 0.69, antiderivative size = 599, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 6, integrand size = 44, $\frac{\text{number of rules}}{\text{integrand size}} = 0.136$, Rules used = {2297, 2215, 2221, 2611, 2320, 6724}

$$-\frac{2g(f+gx)\left(\frac{2cd-be}{\sqrt{b^2-4ac}}+e\right)\text{PolyLog}\left(2,-\frac{2ce^{h+ix}}{b-\sqrt{b^2-4ac}}\right)}{i^2\left(b-\sqrt{b^2-4ac}\right)}-\frac{2g(f+gx)\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\text{PolyLog}\left(2,-\frac{2ce^{h+ix}}{\sqrt{b^2-4ac}+b}\right)}{i^2\left(\sqrt{b^2-4ac}+b\right)}+\frac{2g^2\left(\frac{2cd-be}{\sqrt{b^2-4ac}}+e\right)\text{PolyLog}\left(3,-\frac{2ce^{h+ix}}{b-\sqrt{b^2-4ac}}\right)}{i^3\left(b-\sqrt{b^2-4ac}\right)}+\frac{2g^2\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\text{PolyLog}\left(3,-\frac{2ce^{h+ix}}{\sqrt{b^2-4ac}+b}\right)}{i^3\left(\sqrt{b^2-4ac}+b\right)}-\frac{(f+gx)^2\left(\frac{2cd-be}{\sqrt{b^2-4ac}}+e\right)\log\left(\frac{2ce^{h+ix}}{b-\sqrt{b^2-4ac}}+1\right)}{i\left(b-\sqrt{b^2-4ac}\right)}-\frac{(f+gx)^2\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\log\left(\frac{2ce^{h+ix}}{\sqrt{b^2-4ac}+b}+1\right)}{i\left(\sqrt{b^2-4ac}+b\right)}+\frac{(f+gx)^3\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)}{3g\left(\sqrt{b^2-4ac}+b\right)}+\frac{(f+gx)^3\left(\frac{2cd-be}{\sqrt{b^2-4ac}}+e\right)}{3g\left(b-\sqrt{b^2-4ac}\right)}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*E^(h + i*x))*(f + g*x)^2)/(a + b*E^(h + i*x) + c*E^(2*h + 2*i*x
)),x]
```

```
[Out] ((e - (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*(f + g*x)^3)/(3*(b + Sqrt[b^2 - 4*a*
c])*g) + ((e + (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*(f + g*x)^3)/(3*(b - Sqrt[b
^2 - 4*a*c])*g) - ((e + (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*(f + g*x)^2*Log[1
+ (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])])/((b - Sqrt[b^2 - 4*a*c])*i) -
 ((e - (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*(f + g*x)^2*Log[1 + (2*c*E^(h + i*x
))/(b + Sqrt[b^2 - 4*a*c])])/((b + Sqrt[b^2 - 4*a*c])*i) - (2*(e + (2*c*d -
 b*e)/Sqrt[b^2 - 4*a*c])*g*(f + g*x)*PolyLog[2, (-2*c*E^(h + i*x))/(b - Sqr
t[b^2 - 4*a*c])])/((b - Sqrt[b^2 - 4*a*c])*i^2) - (2*(e - (2*c*d - b*e)/Sqr
t[b^2 - 4*a*c])*g*(f + g*x)*PolyLog[2, (-2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4
*a*c])])/((b + Sqrt[b^2 - 4*a*c])*i^2) + (2*(e + (2*c*d - b*e)/Sqrt[b^2 - 4
*a*c])*g^2*PolyLog[3, (-2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])])/((b - Sq
```

```
rt[b^2 - 4*a*c])*i^3) + (2*(e - (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*g^2*PolyLo
g[3, (-2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])])/((b + Sqrt[b^2 - 4*a*c])*
i^3)
```

Rule 2215

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[(c + d*x)^m*((F^(g*(e + f*x)))^n/(a + b*(F^(g*(e + f*x)))^n)), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2297

```
Int[(((i_.)*(F_)^(u_) + (h_))*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F
_)^(u_) + (c_.)*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dis
t[Simplify[(2*c*h - b*i)/q] + i, Int[(f + g*x)^m/(b - q + 2*c*F^u), x], x]
- Dist[Simplify[(2*c*h - b*i)/q] - i, Int[(f + g*x)^m/(b + q + 2*c*F^u), x]
, x]] /; FreeQ[{F, a, b, c, f, g, h, i}, x] && EqQ[v, 2*u] && LinearQ[u, x]
 && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2611

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Dist[g*(m/(b*c*n*Log[F])), Int[(f + g*x)^(m
 - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e,
 f, g, n}, x] && GtQ[m, 0]
```

Rule 6724

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
```

```
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(d+ee^{h+573x}\right)(f+gx)^2}{a+be^{h+573x}+ce^{2h+1146x}}\,dx = -\left(\left(-e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\int \frac{(f+gx)^2}{b+\sqrt{b^2-4ac}+2ce^{h+573x}}\,dx\right)+\left(e+\frac{2c}{\sqrt{b^2}}\right.$$

$$=\frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3}{3\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3}{3\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(2c\left(e\right.\right.}{}$$

$$=\frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3}{3\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3}{3\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(e+\right.}{}$$

$$=\frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3}{3\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3}{3\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(e+\right.}{}$$

$$=\frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3}{3\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3}{3\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(e+\right.}{}$$

$$=\frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3}{3\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3}{3\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(e+\right.}{}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 1419 vs. $2(599) = 1198$.
time = 1.56, size = 1419, normalized size = 2.37

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*E^(h + i*x))*(f + g*x)^2)/(a + b*E^(h + i*x) + c*E^(2*h +
 2*i*x)),x]
```

```
[Out] -1/6*(-6*Sqrt[-(b^2 - 4*a*c)^2]*d*f*g*i^3*x^2 - 2*Sqrt[-(b^2 - 4*a*c)^2]*d*
g^2*i^3*x^3 + 6*b*Sqrt[b^2 - 4*a*c]*d*f^2*i^2*ArcTan[(b + 2*c*E^(h + i*x))/
Sqrt[-b^2 + 4*a*c]] - 12*a*Sqrt[b^2 - 4*a*c]*e*f^2*i^2*ArcTan[(b + 2*c*E^(h
```

```
 + i*x))/Sqrt[-b^2 + 4*a*c]] - 6*Sqrt[-(b^2 - 4*a*c)^2]*d*f^2*i^2*Log[E^(h
+ i*x)] + 6*Sqrt[-(b^2 - 4*a*c)^2]*d*f*g*i^2*x*Log[1 + (2*c*E^(h + i*x))/(b
 - Sqrt[b^2 - 4*a*c])] + 6*b*Sqrt[-b^2 + 4*a*c]*d*f*g*i^2*x*Log[1 + (2*c*E^
(h + i*x))/(b - Sqrt[b^2 - 4*a*c])] - 12*a*Sqrt[-b^2 + 4*a*c]*e*f*g*i^2*x*L
og[1 + (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])] + 3*Sqrt[-(b^2 - 4*a*c)^2
]*d*g^2*i^2*x^2*Log[1 + (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])] + 3*b*Sq
rt[-b^2 + 4*a*c]*d*g^2*i^2*x^2*Log[1 + (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*
a*c])] - 6*a*Sqrt[-b^2 + 4*a*c]*e*g^2*i^2*x^2*Log[1 + (2*c*E^(h + i*x))/(b
- Sqrt[b^2 - 4*a*c])] + 6*Sqrt[-(b^2 - 4*a*c)^2]*d*f*g*i^2*x*Log[1 + (2*c*E
^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] - 6*b*Sqrt[-b^2 + 4*a*c]*d*f*g*i^2*x*L
og[1 + (2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] + 12*a*Sqrt[-b^2 + 4*a*c]
*e*f*g*i^2*x*Log[1 + (2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] + 3*Sqrt[-(
b^2 - 4*a*c)^2]*d*g^2*i^2*x^2*Log[1 + (2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a
*c])] - 3*b*Sqrt[-b^2 + 4*a*c]*d*g^2*i^2*x^2*Log[1 + (2*c*E^(h + i*x))/(b +
 Sqrt[b^2 - 4*a*c])] + 6*a*Sqrt[-b^2 + 4*a*c]*e*g^2*i^2*x^2*Log[1 + (2*c*E^
(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] + 3*Sqrt[-(b^2 - 4*a*c)^2]*d*f^2*i^2*Lo
g[a + E^(h + i*x)*(b + c*E^(h + i*x))] + 6*(Sqrt[-(b^2 - 4*a*c)^2]*d + b*Sq
rt[-b^2 + 4*a*c]*d - 2*a*Sqrt[-b^2 + 4*a*c]*e)*g*i*(f + g*x)*PolyLog[2, (2*
c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c])] + 6*(Sqrt[-(b^2 - 4*a*c)^2]*d - b*
Sqrt[-b^2 + 4*a*c]*d + 2*a*Sqrt[-b^2 + 4*a*c]*e)*g*i*(f + g*x)*PolyLog[2, (
-2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] - 6*Sqrt[-(b^2 - 4*a*c)^2]*d*g^2
*PolyLog[3, (2*c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c])] - 6*b*Sqrt[-b^2 + 4
*a*c]*d*g^2*PolyLog[3, (2*c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c])] + 12*a*S
qrt[-b^2 + 4*a*c]*e*g^2*PolyLog[3, (2*c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c
])] - 6*Sqrt[-(b^2 - 4*a*c)^2]*d*g^2*PolyLog[3, (-2*c*E^(h + i*x))/(b + Sqr
t[b^2 - 4*a*c])] + 6*b*Sqrt[-b^2 + 4*a*c]*d*g^2*PolyLog[3, (-2*c*E^(h + i*x
))/(b + Sqrt[b^2 - 4*a*c])] - 12*a*Sqrt[-b^2 + 4*a*c]*e*g^2*PolyLog[3, (-2*
c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])])/(a*Sqrt[-(b^2 - 4*a*c)^2]*i^3)
```

Maple [**F**]
time = 0.09, size = 0, normalized size = 0.00

$$\int \frac{\left(d + e\,\mathrm{e}^{ix+h}\right)\left(gx + f\right)^{2}}{a + b\,\mathrm{e}^{ix+h} + c\,\mathrm{e}^{2ix+2h}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*exp(i*x+h))*(g*x+f)^2/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x)
```

```
[Out] int((d+e*exp(i*x+h))*(g*x+f)^2/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x)
```

Maxima [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))*(g*x+f)^2/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x, a
lgorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re deta
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1834 vs. 2(545) = 1090.
time = 0.47, size = 1834, normalized size = 3.06

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))*(g*x+f)^2/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x, a
lgorithm="fricas")
```

```
[Out] 1/6*(2*(I*b^2 - 4*I*a*c)*d*g^2*h^3 + 2*(b^2 - 4*a*c)*d*g^2*x^3 + 6*(b^2 - 4
*a*c)*d*f*g*x^2 + 6*(b^2 - 4*a*c)*d*f^2*x + 6*(-I*b^2 + 4*I*a*c)*d*f^2 + 6*
(b^2 - 4*a*c)*d*f*g + 2*(I*b^2 - 4*I*a*c)*d*g^2 + 6*((b^2 - 4*a*c)*d*f*g +
(I*b^2 - 4*I*a*c)*d*g^2)*h^2 + 6*((-I*b^2 + 4*I*a*c)*d*f^2 + 2*(b^2 - 4*a*c
)*d*f*g + (I*b^2 - 4*I*a*c)*d*g^2)*h + 6*((b^2 - 4*a*c)*d*g^2*x + (b^2 - 4*
a*c)*d*f*g - (2*(a^2*g^2*x + a^2*f*g)*e^2 - (a*b*d*g^2*x + a*b*d*f*g)*e)*sq
rt((b^2 - 4*a*c)/a^2)*e^(-1))*dilog(-1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^(h +
I*x + 1) + 2*a*e + b*e^(h + I*x + 1))*e^(-1)/a + 1) + 6*((b^2 - 4*a*c)*d*g^
2*x + (b^2 - 4*a*c)*d*f*g + (2*(a^2*g^2*x + a^2*f*g)*e^2 - (a*b*d*g^2*x + a
*b*d*f*g)*e)*sqrt((b^2 - 4*a*c)/a^2)*e^(-1))*dilog(1/2*(a*sqrt((b^2 - 4*a*c
)/a^2)*e^(h + I*x + 1) - 2*a*e - b*e^(h + I*x + 1))*e^(-1)/a + 1) + 3*((I*b
^2 - 4*I*a*c)*d*g^2*h^2 + (I*b^2 - 4*I*a*c)*d*g^2*x^2 + 2*(I*b^2 - 4*I*a*c)
*d*f*g*x + 2*(b^2 - 4*a*c)*d*f*g + (I*b^2 - 4*I*a*c)*d*g^2 + (2*(-I*a^2*g^2
*h^2 - I*a^2*g^2*x^2 - 2*I*a^2*f*g*x - 2*a^2*f*g - I*a^2*g^2 - 2*(a^2*f*g +
 I*a^2*g^2)*h)*e^2 + (I*a*b*d*g^2*h^2 + I*a*b*d*g^2*x^2 + 2*I*a*b*d*f*g*x +
 2*a*b*d*f*g + I*a*b*d*g^2 + 2*(a*b*d*f*g + I*a*b*d*g^2)*h)*e)*sqrt((b^2 -
4*a*c)/a^2)*e^(-1) + 2*((b^2 - 4*a*c)*d*f*g + (I*b^2 - 4*I*a*c)*d*g^2)*h)*l
og(1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^(h + I*x + 1) + 2*a*e + b*e^(h + I*x +
1))*e^(-1)/a) + 3*((I*b^2 - 4*I*a*c)*d*g^2*h^2 + (I*b^2 - 4*I*a*c)*d*g^2*x^
2 + 2*(I*b^2 - 4*I*a*c)*d*f*g*x + 2*(b^2 - 4*a*c)*d*f*g + (I*b^2 - 4*I*a*c)
*d*g^2 + (2*(I*a^2*g^2*h^2 + I*a^2*g^2*x^2 + 2*I*a^2*f*g*x + 2*a^2*f*g + I*
a^2*g^2 + 2*(a^2*f*g + I*a^2*g^2)*h)*e^2 + (-I*a*b*d*g^2*h^2 - I*a*b*d*g^2*
x^2 - 2*I*a*b*d*f*g*x - 2*a*b*d*f*g - I*a*b*d*g^2 - 2*(a*b*d*f*g + I*a*b*d*
g^2)*h)*e)*sqrt((b^2 - 4*a*c)/a^2)*e^(-1) + 2*((b^2 - 4*a*c)*d*f*g + (I*b^2
 - 4*I*a*c)*d*g^2)*h)*log(-1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^(h + I*x + 1) -
 2*a*e - b*e^(h + I*x + 1))*e^(-1)/a) + 3*((-I*b^2 + 4*I*a*c)*d*g^2*h^2 + (
I*b^2 - 4*I*a*c)*d*f^2 - 2*(b^2 - 4*a*c)*d*f*g + (-I*b^2 + 4*I*a*c)*d*g^2 +
 (2*(-I*a^2*g^2*h^2 + I*a^2*f^2 - 2*a^2*f*g - I*a^2*g^2 - 2*(a^2*f*g + I*a^
```

```
2*g^2)*h)*e^2 + (I*a*b*d*g^2*h^2 - I*a*b*d*f^2 + 2*a*b*d*f*g + I*a*b*d*g^2
+ 2*(a*b*d*f*g + I*a*b*d*g^2)*h)*e)*sqrt((b^2 - 4*a*c)/a^2)*e^(-1) - 2*((b^
2 - 4*a*c)*d*f*g - (-I*b^2 + 4*I*a*c)*d*g^2)*h)*log(1/2*(a*sqrt((b^2 - 4*a*
c)/a^2)*e + b*e + 2*c*e^(h + I*x + 1))/c) + 3*((-I*b^2 + 4*I*a*c)*d*g^2*h^2
 + (I*b^2 - 4*I*a*c)*d*f^2 - 2*(b^2 - 4*a*c)*d*f*g + (-I*b^2 + 4*I*a*c)*d*g
^2 + (2*(I*a^2*g^2*h^2 - I*a^2*f^2 + 2*a^2*f*g + I*a^2*g^2 + 2*(a^2*f*g + I
*a^2*g^2)*h)*e^2 + (-I*a*b*d*g^2*h^2 + I*a*b*d*f^2 - 2*a*b*d*f*g - I*a*b*d*
g^2 - 2*(a*b*d*f*g + I*a*b*d*g^2)*h)*e)*sqrt((b^2 - 4*a*c)/a^2)*e^(-1) - 2*
((b^2 - 4*a*c)*d*f*g - (-I*b^2 + 4*I*a*c)*d*g^2)*h)*log(-1/2*(a*sqrt((b^2 -
 4*a*c)/a^2)*e - b*e - 2*c*e^(h + I*x + 1))/c) + 6*((I*b^2 - 4*I*a*c)*d*g^2
 + (I*a*b*d*g^2*e - 2*I*a^2*g^2*e^2)*sqrt((b^2 - 4*a*c)/a^2)*e^(-1))*polylo
g(3, -1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^(h + I*x + 1) + b*e^(h + I*x + 1))*e
^(-1)/a) + 6*((I*b^2 - 4*I*a*c)*d*g^2 + (-I*a*b*d*g^2*e + 2*I*a^2*g^2*e^2)*
sqrt((b^2 - 4*a*c)/a^2)*e^(-1))*polylog(3, 1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e
^(h + I*x + 1) - b*e^(h + I*x + 1))*e^(-1)/a))/(a*b^2 - 4*a^2*c)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(d + ee^h e^{ix})(f + gx)^2}{a + be^h e^{ix} + ce^{2h} e^{2ix}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))*(g*x+f)**2/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x)
[Out] Integral((d + e*exp(h)*exp(i*x))*(f + g*x)**2/(a + b*exp(h)*exp(i*x) + c*ex
p(2*h)*exp(2*i*x)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))*(g*x+f)^2/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x, a
lgorithm="giac")
[Out] integrate((g*x + f)^2*(d + e^(h + I*x + 1))/(c*e^(2*h + 2*I*x) + b*e^(h + I
*x) + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(f + g\,x)^2\,(d + e\,\mathrm{e}^{h+i\,x})}{a + b\,\mathrm{e}^{h+i\,x} + c\,\mathrm{e}^{2\,h+2\,i\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(((f + g*x)^2*(d + e*exp(h + i*x)))/(a + b*exp(h + i*x) + c*exp(2*h + 2*i*x)),x)

[Out] int(((f + g*x)^2*(d + e*exp(h + i*x)))/(a + b*exp(h + i*x) + c*exp(2*h + 2*i*x)), x)

3.574 $\int \frac{\left(d+ee^{h+ix}\right)(f+gx)}{a+be^{h+ix}+ce^{2h+2ix}}\,dx$

Optimal. Leaf size=428

$$\frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^2}{2\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^2}{2\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)\log\left(1+\frac{2ce^{h}}{b-\sqrt{b^2}}\right.}{\left(b-\sqrt{b^2-4ac}\right)i}$$

```
[Out] 1/2*(g*x+f)^2*(e+(-b*e+2*c*d)/(-4*a*c+b^2)^(1/2))/g/(b-(-4*a*c+b^2)^(1/2))-
(g*x+f)*ln(1+2*c*exp(i*x+h)/(b-(-4*a*c+b^2)^(1/2)))*(e+(-b*e+2*c*d)/(-4*a*c
+b^2)^(1/2))/i/(b-(-4*a*c+b^2)^(1/2))-g*polylog(2,-2*c*exp(i*x+h)/(b-(-4*a*
c+b^2)^(1/2)))*(e+(-b*e+2*c*d)/(-4*a*c+b^2)^(1/2))/i^2/(b-(-4*a*c+b^2)^(1/2
))+1/2*(g*x+f)^2*(e+(b*e-2*c*d)/(-4*a*c+b^2)^(1/2))/g/(b+(-4*a*c+b^2)^(1/2)
)-(g*x+f)*ln(1+2*c*exp(i*x+h)/(b+(-4*a*c+b^2)^(1/2)))*(e+(b*e-2*c*d)/(-4*a*
c+b^2)^(1/2))/i/(b+(-4*a*c+b^2)^(1/2))-g*polylog(2,-2*c*exp(i*x+h)/(b+(-4*a
*c+b^2)^(1/2)))*(e+(b*e-2*c*d)/(-4*a*c+b^2)^(1/2))/i^2/(b+(-4*a*c+b^2)^(1/2
))
```

Rubi [A]

time = 0.38, antiderivative size = 428, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.119$, Rules used = {2297, 2215, 2221, 2317, 2438}

$$-\frac{g\left(\frac{2cd-be}{\sqrt{b^2-4ac}}+e\right)\text{PolyLog}\left(2,-\frac{2ce^{h+ix}}{b-\sqrt{b^2-4ac}}\right)}{i^2\left(b-\sqrt{b^2-4ac}\right)}-\frac{g\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\text{PolyLog}\left(2,-\frac{2ce^{h+ix}}{\sqrt{b^2-4ac}+b}\right)}{i^2\left(\sqrt{b^2-4ac}+b\right)}-\frac{(f+gx)\left(\frac{2cd-be}{\sqrt{b^2-4ac}}+e\right)\log\left(\frac{2ce^{h+ix}}{b-\sqrt{b^2-4ac}}+1\right)}{i\left(b-\sqrt{b^2-4ac}\right)}-\frac{(f+gx)\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\log\left(\frac{2ce^{h+ix}}{\sqrt{b^2-4ac}+b}+1\right)}{i\left(\sqrt{b^2-4ac}+b\right)}+\frac{(f+gx)^2\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)}{2g\left(\sqrt{b^2-4ac}+b\right)}+\frac{(f+gx)^2\left(\frac{2cd-be}{\sqrt{b^2-4ac}}+e\right)}{2g\left(b-\sqrt{b^2-4ac}\right)}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*E^(h + i*x))*(f + g*x))/(a + b*E^(h + i*x) + c*E^(2*h + 2*i*x))
,x]
```

```
[Out] ((e - (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*(f + g*x)^2)/(2*(b + Sqrt[b^2 - 4*a*
c])*g) + ((e + (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*(f + g*x)^2)/(2*(b - Sqrt[b
^2 - 4*a*c])*g) - ((e + (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*(f + g*x)*Log[1 +
(2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])])/((b - Sqrt[b^2 - 4*a*c])*i) - (
(e - (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*(f + g*x)*Log[1 + (2*c*E^(h + i*x))/(
b + Sqrt[b^2 - 4*a*c])])/((b + Sqrt[b^2 - 4*a*c])*i) - ((e + (2*c*d - b*e)/
Sqrt[b^2 - 4*a*c])*g*PolyLog[2, (-2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])]
)/((b - Sqrt[b^2 - 4*a*c])*i^2) - ((e - (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*g*
PolyLog[2, (-2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])])/((b + Sqrt[b^2 - 4*
a*c])*i^2)
```

Rule 2215

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
```

```
b/a, Int[(c + d*x)^m*((F^(g*(e + f*x)))^n/(a + b*(F^(g*(e + f*x)))^n)), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2297

```
Int[(((i_.)*(F_)^(u_) + (h_))*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F
_)^(u_) + (c_.)*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dis
t[Simplify[(2*c*h - b*i)/q] + i, Int[(f + g*x)^m/(b - q + 2*c*F^u), x], x]
- Dist[Simplify[(2*c*h - b*i)/q] - i, Int[(f + g*x)^m/(b + q + 2*c*F^u), x]
, x]] /; FreeQ[{F, a, b, c, f, g, h, i}, x] && EqQ[v, 2*u] && LinearQ[u, x]
 && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(d+ee^{h+574x}\right)(f+gx)}{a+be^{h+574x}+ce^{2h+1148x}}\,dx = -\left(\left(-e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\int \frac{f+gx}{b+\sqrt{b^2-4ac}+2ce^{h+574x}}\,dx\right)+\Bigg(e+\frac{2cd}{\sqrt{b^2}}$$

$$=\frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^2}{2\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^2}{2\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\Bigg(2c\Bigg(e-}{}$$

$$=\frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^2}{2\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^2}{2\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\Bigg(e+\frac{}{\sqrt{b}}}{}$$

$$=\frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^2}{2\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^2}{2\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\Bigg(e+\frac{}{\sqrt{b}}}{}$$

$$=\frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^2}{2\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^2}{2\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\Bigg(e+\frac{}{\sqrt{b}}}{}$$

Mathematica [**A**]
time = 1.39, size = 644, normalized size = 1.50

[illegible]

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*E^(h + i*x))*(f + g*x))/(a + b*E^(h + i*x) + c*E^(2*h + 2
*i*x)),x]
```

```
[Out] -1/2*(i*(-(Sqrt[-(b^2 - 4*a*c)^2]*d*g*i*x^2) + 2*Sqrt[b^2 - 4*a*c]*(b*d - 2
*a*e)*f*ArcTan[(b + 2*c*E^(h + i*x))/Sqrt[-b^2 + 4*a*c]] - 2*Sqrt[-(b^2 - 4
*a*c)^2]*d*f*Log[E^(h + i*x)] + Sqrt[-(b^2 - 4*a*c)^2]*d*g*x*Log[1 + (2*c*E
^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])] + b*Sqrt[-b^2 + 4*a*c]*d*g*x*Log[1 + (
2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])] - 2*a*Sqrt[-b^2 + 4*a*c]*e*g*x*Lo
g[1 + (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])] + Sqrt[-(b^2 - 4*a*c)^2]*d
*g*x*Log[1 + (2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] - b*Sqrt[-b^2 + 4*a
*c]*d*g*x*Log[1 + (2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] + 2*a*Sqrt[-b^
2 + 4*a*c]*e*g*x*Log[1 + (2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] + Sqrt[
-(b^2 - 4*a*c)^2]*d*f*Log[a + E^(h + i*x)*(b + c*E^(h + i*x))]) + (Sqrt[-(b
^2 - 4*a*c)^2]*d + b*Sqrt[-b^2 + 4*a*c]*d - 2*a*Sqrt[-b^2 + 4*a*c]*e)*g*Pol
yLog[2, (2*c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c])] + (Sqrt[-(b^2 - 4*a*c)^
```

```
2]*d - b*Sqrt[-b^2 + 4*a*c]*d + 2*a*Sqrt[-b^2 + 4*a*c]*e)*g*PolyLog[2, (-2*
c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])])/(a*Sqrt[-(b^2 - 4*a*c)^2]*i^2)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 1260 vs. $2(382) = 764$.

time = 0.05, size = 1261, normalized size = 2.95

method	result
default	Expression too large to display
risch	$\frac{dghx}{ia} - \frac{dg\ln\left(\frac{2c\,e^{ix+h}+\sqrt{-4ca+b^2}+b}{b+\sqrt{-4ca+b^2}}\right)x}{2ia} - \frac{dg\ln\left(\frac{2c\,e^{ix+h}+\sqrt{-4ca+b^2}+b}{b+\sqrt{-4ca+b^2}}\right)h}{2i^2a} + \frac{eg\ln\left(\frac{-2c\,e^{ix+h}+\sqrt{-4ca+}}{-b+\sqrt{-4ca+b}}\right.}{i\sqrt{-4ca+b^2}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*exp(i*x+h))*(g*x+f)/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x,method=_RE
TURNVERBOSE)
```

```
[Out] -1/2*d*f/i/a*ln(a+b*exp(i*x)*exp(h)+c*exp(i*x)^2*exp(2*h))-d*f/i/a*exp(h)*b
/(4*a*c*exp(2*h)-exp(h)^2*b^2)^(1/2)*arctan((exp(h)*b+2*exp(2*h)*exp(i*x)*c
)/(4*a*c*exp(2*h)-exp(h)^2*b^2)^(1/2))+d*f/i/a*ln(exp(i*x))-1/2*d*g/i/a*x/(
exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)*exp(h)*ln((2*exp(2*h)*exp(i*x)*c+exp(h)*
b-(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2))/(exp(h)*b-(exp(h)^2*b^2-4*a*c*exp(2*
h))^(1/2)))*b+1/2*d*g/i/a*x/(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)*exp(h)*ln((
2*exp(2*h)*exp(i*x)*c+exp(h)*b+(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2))/(exp(h)
*b+(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)))*b-1/2*d*g/i/a*x*ln((2*exp(2*h)*exp
(i*x)*c+exp(h)*b-(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2))/(exp(h)*b-(exp(h)^2*b
^2-4*a*c*exp(2*h))^(1/2)))-1/2*d*g/i/a*x*ln((2*exp(2*h)*exp(i*x)*c+exp(h)*b
+(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2))/(exp(h)*b+(exp(h)^2*b^2-4*a*c*exp(2*h
))^(1/2)))+1/2*d*g/i^2/a/(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)*exp(h)*dilog((
2*exp(2*h)*exp(i*x)*c+exp(h)*b+(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2))/(exp(h)
*b+(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)))*b-1/2*d*g/i^2/a/(exp(h)^2*b^2-4*a*
c*exp(2*h))^(1/2)*exp(h)*dilog((2*exp(2*h)*exp(i*x)*c+exp(h)*b-(exp(h)^2*b^
2-4*a*c*exp(2*h))^(1/2))/(exp(h)*b-(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)))*b-
1/2*d*g/i^2/a*dilog((2*exp(2*h)*exp(i*x)*c+exp(h)*b+(exp(h)^2*b^2-4*a*c*exp
(2*h))^(1/2))/(exp(h)*b+(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)))-1/2*d*g/i^2/a
*dilog((2*exp(2*h)*exp(i*x)*c+exp(h)*b-(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2))
/(exp(h)*b-(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)))+1/2*d*g*x^2/a+2*e*exp(h)*f
/i/(4*a*c*exp(2*h)-exp(h)^2*b^2)^(1/2)*arctan((exp(h)*b+2*exp(2*h)*exp(i*x)
*c)/(4*a*c*exp(2*h)-exp(h)^2*b^2)^(1/2))+e*exp(h)*g/i*x/(exp(h)^2*b^2-4*a*c
*exp(2*h))^(1/2)*ln((2*exp(2*h)*exp(i*x)*c+exp(h)*b-(exp(h)^2*b^2-4*a*c*exp
(2*h))^(1/2))/(exp(h)*b-(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)))-e*exp(h)*g/i*
x/(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)*ln((2*exp(2*h)*exp(i*x)*c+exp(h)*b+(e
xp(h)^2*b^2-4*a*c*exp(2*h))^(1/2))/(exp(h)*b+(exp(h)^2*b^2-4*a*c*exp(2*h))^
(1/2)))+e*exp(h)*g/i^2/(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)*dilog((2*exp(2*h
)*exp(i*x)*c+exp(h)*b-(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2))/(exp(h)*b-(exp(h
```

```
)^2*b^2-4*a*c*exp(2*h))^(1/2)))-e*exp(h)*g/i^2/(exp(h)^2*b^2-4*a*c*exp(2*h)
)^(1/2)*dilog((2*exp(2*h)*exp(i*x)*c+exp(h)*b+(exp(h)^2*b^2-4*a*c*exp(2*h))
^(1/2))/(exp(h)*b+(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)))
```

Maxima [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))*(g*x+f)/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x, alg
orithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re deta
```

Fricas [**B**] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 885 vs. 2(388) = 776.
time = 0.39, size = 885, normalized size = 2.07

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))*(g*x+f)/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x, alg
orithm="fricas")
```

```
[Out] 1/2*((b^2 - 4*a*c)*d*g*h^2 + (b^2 - 4*a*c)*d*g*x^2 + 2*(b^2 - 4*a*c)*d*f*x
+ 2*(-I*b^2 + 4*I*a*c)*d*f + (b^2 - 4*a*c)*d*g + 2*((-I*b^2 + 4*I*a*c)*d*f
+ (b^2 - 4*a*c)*d*g)*h + ((b^2 - 4*a*c)*d*g + (a*b*d*g*e - 2*a^2*g*e^2)*sqr
t((b^2 - 4*a*c)/a^2)*e^(-1))*dilog(-1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^(h + I
*x + 1) + 2*a*e + b*e^(h + I*x + 1))*e^(-1)/a + 1) + ((b^2 - 4*a*c)*d*g - (
a*b*d*g*e - 2*a^2*g*e^2)*sqrt((b^2 - 4*a*c)/a^2)*e^(-1))*dilog(1/2*(a*sqrt(
(b^2 - 4*a*c)/a^2)*e^(h + I*x + 1) - 2*a*e - b*e^(h + I*x + 1))*e^(-1)/a +
1) + ((b^2 - 4*a*c)*d*g*h - (-I*b^2 + 4*I*a*c)*d*g*x + (b^2 - 4*a*c)*d*g -
(2*(a^2*g*h + I*a^2*g*x + a^2*g)*e^2 - (a*b*d*g*h + I*a*b*d*g*x + a*b*d*g)*
e)*sqrt((b^2 - 4*a*c)/a^2)*e^(-1))*log(1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^(h
+ I*x + 1) + 2*a*e + b*e^(h + I*x + 1))*e^(-1)/a) + ((b^2 - 4*a*c)*d*g*h -
(-I*b^2 + 4*I*a*c)*d*g*x + (b^2 - 4*a*c)*d*g + (2*(a^2*g*h + I*a^2*g*x + a^
2*g)*e^2 - (a*b*d*g*h + I*a*b*d*g*x + a*b*d*g)*e)*sqrt((b^2 - 4*a*c)/a^2)*e
^(-1))*log(-1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^(h + I*x + 1) - 2*a*e - b*e^(h
 + I*x + 1))*e^(-1)/a) - ((b^2 - 4*a*c)*d*g*h + (-I*b^2 + 4*I*a*c)*d*f + (b
^2 - 4*a*c)*d*g + (2*(a^2*g*h - I*a^2*f + a^2*g)*e^2 - (a*b*d*g*h - I*a*b*d
*f + a*b*d*g)*e)*sqrt((b^2 - 4*a*c)/a^2)*e^(-1))*log(1/2*(a*sqrt((b^2 - 4*a
*c)/a^2)*e + b*e + 2*c*e^(h + I*x + 1))/c) - ((b^2 - 4*a*c)*d*g*h + (-I*b^2
```

```
 + 4*I*a*c)*d*f + (b^2 - 4*a*c)*d*g - (2*(a^2*g*h - I*a^2*f + a^2*g)*e^2 -
(a*b*d*g*h - I*a*b*d*f + a*b*d*g)*e)*sqrt((b^2 - 4*a*c)/a^2)*e^(-1))*log(-1
/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e - b*e - 2*c*e^(h + I*x + 1))/c))/(a*b^2 - 4
*a^2*c)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d + ee^{h}e^{ix}\right)\left(f + gx\right)}{a + be^{h}e^{ix} + ce^{2h}e^{2ix}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))*(g*x+f)/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x)
```

```
[Out] Integral((d + e*exp(h)*exp(i*x))*(f + g*x)/(a + b*exp(h)*exp(i*x) + c*exp(2
*h)*exp(2*i*x)), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))*(g*x+f)/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x, alg
orithm="giac")
```

```
[Out] integrate((g*x + f)*(d + e^(h + I*x + 1))/(c*e^(2*h + 2*I*x) + b*e^(h + I*x
) + a), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(f + g\,x\right)\,\left(d + e\,\mathrm{e}^{h + i\,x}\right)}{a + b\,\mathrm{e}^{h + i\,x} + c\,\mathrm{e}^{2\,h + 2\,i\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((f + g*x)*(d + e*exp(h + i*x)))/(a + b*exp(h + i*x) + c*exp(2*h + 2*i*
x)),x)
```

```
[Out] int(((f + g*x)*(d + e*exp(h + i*x)))/(a + b*exp(h + i*x) + c*exp(2*h + 2*i*
x)), x)
```

3.575 $\int \frac{d+ee^{h+ix}}{a+be^{h+ix}+ce^{2h+2ix}}\,dx$

Optimal. Leaf size=95

$$\frac{dx}{a}+\frac{(bd-2ae)\tanh^{-1}\left(\frac{b+2ce^{h+ix}}{\sqrt{b^2-4ac}}\right)}{a\sqrt{b^2-4ac}\,i}-\frac{d\log\left(a+be^{h+ix}+ce^{2h+2ix}\right)}{2ai}$$

```
[Out] d*x/a-1/2*d*ln(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/a/i+(-2*a*e+b*d)*arctanh((b
+2*c*exp(i*x+h))/(-4*a*c+b^2)^(1/2))/a/i/(-4*a*c+b^2)^(1/2)
```

Rubi [A]
time = 0.10, antiderivative size = 95, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.162, Rules used = {2320, 814, 648, 632, 212, 642}

$$\frac{(bd-2ae)\tanh^{-1}\left(\frac{b+2ce^{h+ix}}{\sqrt{b^2-4ac}}\right)}{ai\sqrt{b^2-4ac}}-\frac{d\log\left(a+be^{h+ix}+ce^{2h+2ix}\right)}{2ai}+\frac{dx}{a}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*E^(h + i*x))/(a + b*E^(h + i*x) + c*E^(2*h + 2*i*x)),x]
```

```
[Out] (d*x)/a + ((b*d - 2*a*e)*ArcTanh[(b + 2*c*E^(h + i*x))/Sqrt[b^2 - 4*a*c]])/
(a*Sqrt[b^2 - 4*a*c]*i) - (d*Log[a + b*E^(h + i*x) + c*E^(2*h + 2*i*x)])/(2
*a*i)
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 632

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 642

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[d*(Log[RemoveContent[a + b*x + c*x^2, x]]/b), x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 648

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 814

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_.) + (b_.)*(x_) +
(c_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*((f + g*x)/(a +
 b*x + c*x^2)), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[b^2 - 4*a*
c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegerQ[m]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}
\int \frac{d+ee^{h+575x}}{a+be^{h+575x}+ce^{2h+1150x}}\,dx &= \frac{1}{575}\text{Subst}\left(\int \frac{d+ex}{x(a+bx+cx^2)}\,dx,x,e^{h+575x}\right)\\
&= \frac{1}{575}\text{Subst}\left(\int \left(\frac{d}{ax}+\frac{-bd+ae-cdx}{a(a+bx+cx^2)}\right)dx,x,e^{h+575x}\right)\\
&= \frac{dx}{a}+\frac{\text{Subst}\left(\int \frac{-bd+ae-cdx}{a+bx+cx^2}\,dx,x,e^{h+575x}\right)}{575a}\\
&= \frac{dx}{a}-\frac{d\text{Subst}\left(\int \frac{b+2cx}{a+bx+cx^2}\,dx,x,e^{h+575x}\right)}{1150a}-\frac{(bd-2ae)\text{Subst}\left(\int \frac{1}{a+bx+cx^2}\,dx\right.}{1150a}\\
&= \frac{dx}{a}-\frac{d\log\left(a+be^{h+575x}+ce^{2h+1150x}\right)}{1150a}+\frac{(bd-2ae)\text{Subst}\left(\int \frac{1}{b^2-4ac-x^2}\,dx\right.}{575a}\\
&= \frac{dx}{a}+\frac{(bd-2ae)\tanh^{-1}\left(\frac{b+2ce^{h+575x}}{\sqrt{b^2-4ac}}\right)}{575a\sqrt{b^2-4ac}}-\frac{d\log\left(a+be^{h+575x}+ce^{2h+1150}\right.}{1150a}
\end{aligned}$$

Mathematica [A]
time = 0.18, size = 100, normalized size = 1.05

$$\frac{\frac{(-2bd+4ae)\tan^{-1}\left(\frac{b+2ce^{h+ix}}{\sqrt{-b^2+4ac}}\right)}{\sqrt{-b^2+4ac}}+d\left(2\log\left(e^{h+ix}\right)-\log\left(a+e^{h+ix}\left(b+ce^{h+ix}\right)\right)\right)}{2ai}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*E^(h + i*x))/(a + b*E^(h + i*x) + c*E^(2*h + 2*i*x)),x]
```

```
[Out] (((-2*b*d + 4*a*e)*ArcTan[(b + 2*c*E^(h + i*x))/Sqrt[-b^2 + 4*a*c]])/Sqrt[-
b^2 + 4*a*c] + d*(2*Log[E^(h + i*x)] - Log[a + E^(h + i*x)*(b + c*E^(h + i*
x))]))/(2*a*i)
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 182 vs. $2(86) = 172$.
time = 0.09, size = 183, normalized size = 1.93

method	result
default	$-\frac{d\ln\left(a+b\,e^{ix} e^{h}+c\,e^{2ix} e^{2h}\right)}{2ia}-\frac{d\,e^{h} b \arctan\left(\frac{e^{h} b+2\,e^{2h} e^{ix} c}{\sqrt{4ac\,e^{2h}-e^{2h} b^{2}}}\right)}{ia\sqrt{4ac\,e^{2h}-e^{2h} b^{2}}}+\frac{d\ln\left(e^{ix}\right)}{ia}+\frac{2e\,e^{h} \arctan\left(\frac{e^{h} b+2\,e^{2h} e^{ix} c}{\sqrt{4ac\,e^{2h}-e^{2h} b^{2}}}\right)}{i\sqrt{4ac\,e^{2h}-e^{2h} b^{2}}}$
risch	$\frac{4acd\,i^{2} x}{4a^{2} c\,i^{2}-a\,b^{2} i^{2}}-\frac{b^{2} d\,i^{2} x}{4a^{2} c\,i^{2}-a\,b^{2} i^{2}}+\frac{4acdhi}{4a^{2} c\,i^{2}-a\,b^{2} i^{2}}-\frac{b^{2} dhi}{4a^{2} c\,i^{2}-a\,b^{2} i^{2}}-\frac{2\ln\left(e^{ix+h}+\frac{2bae-b^{2} d+\sqrt{-16a^{3} c\,e^{2}+4a^{2} b^{2} e^{2}+}}{}\right.}{(4ca}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x,method=_RETURNVERB
OSE)
```

```
[Out] -1/2*d/i/a*ln(a+b*exp(i*x)*exp(h)+c*exp(i*x)^2*exp(2*h))-d/i/a*exp(h)*b/(4*
a*c*exp(2*h)-exp(h)^2*b^2)^(1/2)*arctan((exp(h)*b+2*exp(2*h)*exp(i*x)*c)/(4
*a*c*exp(2*h)-exp(h)^2*b^2)^(1/2))+d/i/a*ln(exp(i*x))+2*e*exp(h)/i/(4*a*c*e
xp(2*h)-exp(h)^2*b^2)^(1/2)*arctan((exp(h)*b+2*exp(2*h)*exp(i*x)*c)/(4*a*c*
exp(2*h)-exp(h)^2*b^2)^(1/2))
```

Maxima [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re deta
```

Fricas [B] Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 327 vs. $2(81) = 162$.

time = 0.39, size = 327, normalized size = 3.44

$$\frac{2\,dx - \left(a\sqrt{-\frac{b^{2}d^{2} - 4\,abde + 4\,a^{2}e^{2}}{a^{2}b^{2} - 4\,a^{3}c}} - i\,d\right)\log\left(\frac{b^{2}de - 2\,abe^{2} - (i\,ab^{2} - 4i\,a^{2}c)\sqrt{-\frac{b^{2}d^{2} - 4\,abde + 4\,a^{2}e^{2}}{a^{2}b^{2} - 4\,a^{3}c}}\,e + 2\,(bcd - 2\,ace)e^{(h+i\,x+1)}}{2\,(bcd - 2\,ace)}\right) + \left(a\sqrt{-\frac{b^{2}d^{2} - 4\,abde + 4\,a^{2}e^{2}}{a^{2}b^{2} - 4\,a^{3}c}} + i\,d\right)\log\left(\frac{b^{2}de - 2\,abe^{2} - (-i\,ab^{2} + 4i\,a^{2}c)\sqrt{-\frac{b^{2}d^{2} - 4\,abde + 4\,a^{2}e^{2}}{a^{2}b^{2} - 4\,a^{3}c}}\,e + 2\,(bcd - 2\,ace)e^{(h+i\,x+1)}}{2\,(bcd - 2\,ace)}\right)}{2\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x, algorithm="
fricas")
```

```
[Out] 1/2*(2*d*x - (a*sqrt(-(b^2*d^2 - 4*a*b*d*e + 4*a^2*e^2)/(a^2*b^2 - 4*a^3*c)
) - I*d)*log(1/2*(b^2*d*e - 2*a*b*e^2 - (I*a*b^2 - 4*I*a^2*c)*sqrt(-(b^2*d^
2 - 4*a*b*d*e + 4*a^2*e^2)/(a^2*b^2 - 4*a^3*c))*e + 2*(b*c*d - 2*a*c*e)*e^(
h + I*x + 1))/(b*c*d - 2*a*c*e)) + (a*sqrt(-(b^2*d^2 - 4*a*b*d*e + 4*a^2*e^
2)/(a^2*b^2 - 4*a^3*c)) + I*d)*log(1/2*(b^2*d*e - 2*a*b*e^2 - (-I*a*b^2 + 4
*I*a^2*c)*sqrt(-(b^2*d^2 - 4*a*b*d*e + 4*a^2*e^2)/(a^2*b^2 - 4*a^3*c))*e +
2*(b*c*d - 2*a*c*e)*e^(h + I*x + 1))/(b*c*d - 2*a*c*e)))/a
```

Sympy [A]
time = 0.55, size = 116, normalized size = 1.22

$$\operatorname{RootSum}\left(z^{2}\cdot\left(4a^{2}ci^{2} - ab^{2}i^{2}\right) + z\left(4acdi - b^{2}di\right) + ae^{2} - bde + cd^{2}, \left(i \mapsto i\log\left(e^{h+ix} + \frac{4ia^{2}ci - iab^{2}i + abe + 2acd - b^{2}d}{2ace - bcd}\right)\right)\right) + \frac{dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x)
```

```
[Out] RootSum(_z**2*(4*a**2*c*i**2 - a*b**2*i**2) + _z*(4*a*c*d*i - b**2*d*i) + a
*e**2 - b*d*e + c*d**2, Lambda(_i, _i*log(exp(h + i*x) + (4*_i*a**2*c*i - _
i*a*b**2*i + a*b*e + 2*a*c*d - b**2*d)/(2*a*c*e - b*c*d)))) + d*x/a
```

Giac [A]
time = 4.61, size = 98, normalized size = 1.03

$$\frac{i\left(bde^{h} - 2\,ae^{(h+1)}\right)\arctan\left(\frac{2\,ce^{(h+i\,x)}+b}{\sqrt{-b^{2}+4\,ac}}\right)e^{(-h)}}{\sqrt{-b^{2}+4\,ac}\,a} + \frac{i\,d\log\left(ce^{(2\,h+2i\,x)} + be^{(h+i\,x)} + a\right)}{2\,a} - \frac{i\,d\log\left(e^{(i\,x)}\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x, algorithm="
giac")
```

```
[Out] I*(b*d*e^h - 2*a*e^(h + 1))*arctan((2*c*e^(h + I*x) + b)/sqrt(-b^2 + 4*a*c)
)*e^(-h)/(sqrt(-b^2 + 4*a*c)*a) + 1/2*I*d*log(c*e^(2*h + 2*I*x) + b*e^(h +
I*x) + a)/a - I*d*log(e^(I*x))/a
```

Mupad [B]
time = 3.78, size = 91, normalized size = 0.96

$$\frac{d\,x}{a}-\frac{d\,\ln\left(a+b\,\mathrm{e}^{i\,x}\,\mathrm{e}^{h}+c\,\mathrm{e}^{2\,h}\,\mathrm{e}^{2\,i\,x}\right)}{2\,a\,i}+\frac{\mathrm{atan}\left(\frac{b+2\,c\,\mathrm{e}^{i\,x}\,\mathrm{e}^{h}}{\sqrt{4\,a\,c-b^2}}\right)\,\left(2\,a\,e-b\,d\right)}{a\,i\,\sqrt{4\,a\,c-b^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*exp(h + i*x))/(a + b*exp(h + i*x) + c*exp(2*h + 2*i*x)),x)
```

```
[Out] (d*x)/a - (d*log(a + b*exp(i*x)*exp(h) + c*exp(2*h)*exp(2*i*x)))/(2*a*i) +
(atan((b + 2*c*exp(i*x)*exp(h))/(4*a*c - b^2)^(1/2))*(2*a*e - b*d))/(a*i*(4
*a*c - b^2)^(1/2))
```

3.576 $\int \frac{d+ee^{h+ix}}{(a+be^{h+ix}+ce^{2h+2ix})(f+gx)}\,dx$

Optimal. Leaf size=84

$$d\text{Int}\left(\frac{1}{(a+be^{h+ix}+ce^{2h+2ix})(f+gx)},x\right)+e\text{Int}\left(\frac{e^{h+ix}}{(a+be^{h+ix}+ce^{2h+2ix})(f+gx)},x\right)$$

```
[Out] d*CannotIntegrate(1/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f),x)+e*CannotIn
tegrate(exp(i*x+h)/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f),x)
```

Rubi [A]
time = 0.69, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{d+ee^{h+ix}}{(a+be^{h+ix}+ce^{2h+2ix})(f+gx)}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(d + e*E^(h + i*x))/((a + b*E^(h + i*x) + c*E^(2*h + 2*i*x))*(f + g*x))
,x]
```

```
[Out] d*Defer[Int][1/((a + b*E^(h + i*x) + c*E^(2*h + 2*i*x))*(f + g*x)), x] + e*
Defer[Int][E^(h + i*x)/((a + b*E^(h + i*x) + c*E^(2*h + 2*i*x))*(f + g*x)),
 x]
```

Rubi steps

$$\begin{aligned}\int \frac{d+ee^{h+576x}}{(a+be^{h+576x}+ce^{2h+1152x})(f+gx)}\,dx &= \int \left(\frac{d}{(a+be^{h+576x}+ce^{2h+1152x})(f+gx)}+\frac{ee^{h+}}{(a+be^{h+576x}+ce}\right.\\ &= d\int \frac{1}{(a+be^{h+576x}+ce^{2h+1152x})(f+gx)}\,dx+e\int \frac{}{(a+be^{h+57}}\end{aligned}$$

Mathematica [A]
time = 0.91, size = 0, normalized size = 0.00

$$\int \frac{d+ee^{h+ix}}{(a+be^{h+ix}+ce^{2h+2ix})(f+gx)}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(d + e*E^(h + i*x))/((a + b*E^(h + i*x) + c*E^(2*h + 2*i*x))*(f +
 g*x)),x]
```

```
[Out] Integrate[(d + e*E^(h + i*x))/((a + b*E^(h + i*x) + c*E^(2*h + 2*i*x))*(f +
 g*x)), x]
```

Maple [A]
time = 0.05, size = 0, normalized size = 0.00

$$\int \frac{d+e\,\mathrm{e}^{ix+h}}{\left(a+b\,\mathrm{e}^{ix+h}+c\,\mathrm{e}^{2ix+2h}\right)(gx+f)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f),x)
```

```
[Out] int((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f),x, alg
orithm="maxima")
```

```
[Out] integrate((e*e^(i*x + h) + d)/((g*x + f)*(c*e^(2*i*x + 2*h) + b*e^(i*x + h)
 + a)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f),x, alg
orithm="fricas")
```

```
[Out] integral((d*e^2 + e^(h + I*x + 3))/((a*g*x + a*f)*e^2 + (c*g*x + c*f)*e^(2*
h + 2*I*x + 2) + (b*g*x + b*f)*e^(h + I*x + 2)), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{d+ee^{h}e^{ix}}{(f+gx)\left(a+be^{h}e^{ix}+ce^{2h}e^{2ix}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f),x)
```

```
[Out] Integral((d + e*exp(h)*exp(i*x))/((f + g*x)*(a + b*exp(h)*exp(i*x) + c*exp(
2*h)*exp(2*i*x))), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f),x, alg
orithm="giac")
```

```
[Out] integrate((d + e^(h + I*x + 1))/((g*x + f)*(c*e^(2*h + 2*I*x) + b*e^(h + I*
x) + a)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{d+e\,\mathrm{e}^{h+i\,x}}{(f+g\,x)\,\left(a+b\,\mathrm{e}^{h+i\,x}+c\,\mathrm{e}^{2\,h+2\,i\,x}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*exp(h + i*x))/((f + g*x)*(a + b*exp(h + i*x) + c*exp(2*h + 2*i*x
))),x)
```

```
[Out] int((d + e*exp(h + i*x))/((f + g*x)*(a + b*exp(h + i*x) + c*exp(2*h + 2*i*x
))), x)
```

3.577 $\int \frac{d+ee^{h+ix}}{\left(a+be^{h+ix}+ce^{2h+2ix}\right)(f+gx)^2}\,dx$

Optimal. Leaf size=84

$$d\text{Int}\left(\frac{1}{\left(a+be^{h+ix}+ce^{2h+2ix}\right)(f+gx)^2},x\right)+e\text{Int}\left(\frac{e^{h+ix}}{\left(a+be^{h+ix}+ce^{2h+2ix}\right)(f+gx)^2},x\right)$$

```
[Out] d*CannotIntegrate(1/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f)^2,x)+e*Cannot
Integrate(exp(i*x+h)/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f)^2,x)
```

Rubi [A]
time = 0.62, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{d+ee^{h+ix}}{\left(a+be^{h+ix}+ce^{2h+2ix}\right)(f+gx)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(d + e*E^(h + i*x))/((a + b*E^(h + i*x) + c*E^(2*h + 2*i*x))*(f + g*x)^
2),x]
```

```
[Out] d*Defer[Int][1/((a + b*E^(h + i*x) + c*E^(2*h + 2*i*x))*(f + g*x)^2), x] +
e*Defer[Int][E^(h + i*x)/((a + b*E^(h + i*x) + c*E^(2*h + 2*i*x))*(f + g*x)
^2), x]
```

Rubi steps

$$\int \frac{d+ee^{h+577x}}{\left(a+be^{h+577x}+ce^{2h+1154x}\right)(f+gx)^2}\,dx=\int \left(\frac{d}{\left(a+be^{h+577x}+ce^{2h+1154x}\right)(f+gx)^2}+\frac{ee^{h\cdots}}{\left(a+be^{h+577x}+ce\cdots\right.}\right.$$
$$=d\int \frac{1}{\left(a+be^{h+577x}+ce^{2h+1154x}\right)(f+gx)^2}\,dx+e\int \frac{\cdots}{\left(a+be^{h+5\cdots}\right.}$$

Mathematica [A]
time = 7.41, size = 0, normalized size = 0.00

$$\int \frac{d+ee^{h+ix}}{\left(a+be^{h+ix}+ce^{2h+2ix}\right)(f+gx)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(d + e*E^(h + i*x))/((a + b*E^(h + i*x) + c*E^(2*h + 2*i*x))*(f +
 g*x)^2),x]
```

```
[Out] Integrate[(d + e*E^(h + i*x))/((a + b*E^(h + i*x) + c*E^(2*h + 2*i*x))*(f +
 g*x)^2), x]
```

Maple [A]
time = 0.07, size = 0, normalized size = 0.00

$$\int \frac{d + e\,\mathrm{e}^{ix+h}}{\left(a + b\,\mathrm{e}^{ix+h} + c\,\mathrm{e}^{2ix+2h}\right)\left(gx+f\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f)^2,x)
```

```
[Out] int((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f)^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f)^2,x, a
lgorithm="maxima")
```

```
[Out] integrate((e*e^(i*x + h) + d)/((g*x + f)^2*(c*e^(2*i*x + 2*h) + b*e^(i*x +
h) + a)), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f)^2,x, a
lgorithm="fricas")
```

```
[Out] integral((d*e^2 + e^(h + I*x + 3))/((a*g^2*x^2 + 2*a*f*g*x + a*f^2)*e^2 + (
c*g^2*x^2 + 2*c*f*g*x + c*f^2)*e^(2*h + 2*I*x + 2) + (b*g^2*x^2 + 2*b*f*g*x
 + b*f^2)*e^(h + I*x + 2)), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f)**2,x)
```

```
[Out] Timed out
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f)^2,x, a
lgorithm="giac")
```

```
[Out] integrate((d + e^(h + I*x + 1))/((g*x + f)^2*(c*e^(2*h + 2*I*x) + b*e^(h +
I*x) + a)), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{d+e\,\mathrm{e}^{h+i\,x}}{{\left(f+g\,x\right)}^2\,\left(a+b\,\mathrm{e}^{h+i\,x}+c\,\mathrm{e}^{2\,h+2\,i\,x}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*exp(h + i*x))/((f + g*x)^2*(a + b*exp(h + i*x) + c*exp(2*h + 2*i
*x))),x)
```

```
[Out] int((d + e*exp(h + i*x))/((f + g*x)^2*(a + b*exp(h + i*x) + c*exp(2*h + 2*i
*x))), x)
```

3.578 $\int \frac{\left(be-aee^{c+dx}\right)x}{be-2aee^{c+dx}-bee^{2(c+dx)}}\,dx$

Optimal. Leaf size=150

$$\frac{x^2}{2}-\frac{x\log\left(1+\frac{be^{c+dx}}{a-\sqrt{a^2+b^2}}\right)}{2d}-\frac{x\log\left(1+\frac{be^{c+dx}}{a+\sqrt{a^2+b^2}}\right)}{2d}-\frac{\text{Li}_2\left(-\frac{be^{c+dx}}{a-\sqrt{a^2+b^2}}\right)}{2d^2}-\frac{\text{Li}_2\left(-\frac{be^{c+dx}}{a+\sqrt{a^2+b^2}}\right)}{2d^2}$$

```
[Out] 1/2*x^2-1/2*x*ln(1+b*exp(d*x+c)/(a-(a^2+b^2)^(1/2)))/d-1/2*x*ln(1+b*exp(d*x
+c)/(a+(a^2+b^2)^(1/2)))/d-1/2*polylog(2,-b*exp(d*x+c)/(a-(a^2+b^2)^(1/2)))
/d^2-1/2*polylog(2,-b*exp(d*x+c)/(a+(a^2+b^2)^(1/2)))/d^2
```

Rubi [A]
time = 0.46, antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 47, $\frac{\text{number of rules}}{\text{integrand size}} = 0.106$, Rules used = {2297, 2215, 2221, 2317, 2438}

$$-\frac{\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a-\sqrt{a^2+b^2}}\right)}{2d^2}-\frac{\text{PolyLog}\left(2,-\frac{be^{c+dx}}{\sqrt{a^2+b^2}+a}\right)}{2d^2}-\frac{x\log\left(\frac{be^{c+dx}}{a-\sqrt{a^2+b^2}}+1\right)}{2d}-\frac{x\log\left(\frac{be^{c+dx}}{\sqrt{a^2+b^2}+a}+1\right)}{2d}+\frac{x^2}{2}$$

Antiderivative was successfully verified.

```
[In] Int[((b*e - a*e*E^(c + d*x))*x)/(b*e - 2*a*e*E^(c + d*x) - b*e*E^(2*(c + d*
x))),x]
```

```
[Out] x^2/2 - (x*Log[1 + (b*E^(c + d*x))/(a - Sqrt[a^2 + b^2])])/(2*d) - (x*Log[1
 + (b*E^(c + d*x))/(a + Sqrt[a^2 + b^2])])/(2*d) - PolyLog[2, -((b*E^(c + d
*x))/(a - Sqrt[a^2 + b^2]))]/(2*d^2) - PolyLog[2, -((b*E^(c + d*x))/(a + Sq
rt[a^2 + b^2]))]/(2*d^2)
```

Rule 2215

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[(c + d*x)^m*((F^(g*(e + f*x)))^n/(a + b*(F^(g*(e + f*x)))^n)), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2221

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Di
st[d*(m/(b*f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x)
))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2297

```
Int[(((i_.)*(F_)^(u_) + (h_))*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F
_)^(u_) + (c_.)*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dis
t[Simplify[(2*c*h - b*i)/q] + i, Int[(f + g*x)^m/(b - q + 2*c*F^u), x], x]
- Dist[Simplify[(2*c*h - b*i)/q] - i, Int[(f + g*x)^m/(b + q + 2*c*F^u), x]
, x]] /; FreeQ[{F, a, b, c, f, g, h, i}, x] && EqQ[v, 2*u] && LinearQ[u, x]
 && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2317

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2438

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(be - aee^{c+dx}\right)x}{be - 2aee^{c+dx} - bee^{2(c+dx)}}\,dx = -\left(\left(\left(a - \sqrt{a^2+b^2}\right)e\right)\int \frac{x}{-2ae + 2\sqrt{a^2+b^2}\,e - 2bee^{c+dx}}\,dx\right) - \left(\left(a \ldots\right.\right.$$

$$= \frac{x^2}{2} + (be)\int \frac{e^{c+dx}x}{-2ae - 2\sqrt{a^2+b^2}\,e - 2bee^{c+dx}}\,dx + (be)\int \frac{e^{c\ldots}}{-2ae + 2\sqrt{a^2 \ldots}}$$

$$= \frac{x^2}{2} - \frac{x\log\left(1 + \frac{be^{c+dx}}{a-\sqrt{a^2+b^2}}\right)}{2d} - \frac{x\log\left(1 + \frac{be^{c+dx}}{a+\sqrt{a^2+b^2}}\right)}{2d} + \frac{\int \log\left(1 \ldots\right.}{\ldots}$$

$$= \frac{x^2}{2} - \frac{x\log\left(1 + \frac{be^{c+dx}}{a-\sqrt{a^2+b^2}}\right)}{2d} - \frac{x\log\left(1 + \frac{be^{c+dx}}{a+\sqrt{a^2+b^2}}\right)}{2d} + \frac{\text{Subst}\left(\int \ldots\right.}{\ldots}$$

$$= \frac{x^2}{2} - \frac{x\log\left(1 + \frac{be^{c+dx}}{a-\sqrt{a^2+b^2}}\right)}{2d} - \frac{x\log\left(1 + \frac{be^{c+dx}}{a+\sqrt{a^2+b^2}}\right)}{2d} - \frac{\text{Li}_2\left(-\frac{\ldots}{a-\ldots}\right.}{2\ldots}$$

Mathematica [A]
time = 0.36, size = 176, normalized size = 1.17

$$-\frac{dx\left(-dx + \log\left(1 + \frac{be^{2c+dx}}{ae^c - \sqrt{(a^2+b^2)\,e^{2c}}}\right) + \log\left(1 + \frac{be^{2c+dx}}{ae^c + \sqrt{(a^2+b^2)\,e^{2c}}}\right)\right) + \text{Li}_2\left(-\frac{be^{2c+dx}}{ae^c - \sqrt{(a^2+b^2)\,e^{2c}}}\right) + \text{Li}_2\left(-\frac{be^{2c+dx}}{ae^c + \sqrt{(a^2+b^2)\,e^{2c}}}\right)}{2d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((b*e - a*e*E^(c + d*x))*x)/(b*e - 2*a*e*E^(c + d*x) - b*e*E^(2*(
c + d*x))),x]
```

```
[Out] -1/2*(d*x*(-(d*x) + Log[1 + (b*E^(2*c + d*x))/(a*E^c - Sqrt[(a^2 + b^2)*E^(
2*c)])] + Log[1 + (b*E^(2*c + d*x))/(a*E^c + Sqrt[(a^2 + b^2)*E^(2*c)])]) +
 PolyLog[2, -((b*E^(2*c + d*x))/(a*E^c - Sqrt[(a^2 + b^2)*E^(2*c)]))] + Pol
yLog[2, -((b*E^(2*c + d*x))/(a*E^c + Sqrt[(a^2 + b^2)*E^(2*c)]))])/d^2
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 284 vs. $2(128) = 256$.
time = 0.06, size = 285, normalized size = 1.90

method	result
default	$\frac{x^2}{2} - \frac{x\ln\left(\frac{e^{2c}e^{dx}b+e^{c}a-\sqrt{e^{2c}a^2+b^2e^{2c}}}{e^{c}a-\sqrt{e^{2c}a^2+b^2e^{2c}}}\right)}{2d} - \frac{x\ln\left(\frac{e^{2c}e^{dx}b+e^{c}a+\sqrt{e^{2c}a^2+b^2e^{2c}}}{e^{c}a+\sqrt{e^{2c}a^2+b^2e^{2c}}}\right)}{2d} - \frac{\mathrm{dilog}\left(\frac{e^{2c}e^{dx}b+e^{c}a+\sqrt{e^{2c}a^2}}{e^{c}a+\sqrt{e^{2c}a^2+}}\right.}{2d^2}$
risch	$-\frac{c\ln(e^{dx+c})}{d^2} + \frac{c\ln(2e^{dx+c}a+e^{2dx+2c}b-b)}{2d^2} + \frac{x^2}{2} + \frac{cx}{d} + \frac{c^2}{2d^2} - \frac{\ln\left(\frac{-b e^{dx+c}+\sqrt{a^2+b^2}-a}{-a+\sqrt{a^2+b^2}}\right)x}{2d} - \frac{\ln\left(\frac{-b e^{dx+c}+\sqrt{a}}{-a+\sqrt{a^2}}\right.}{2d^2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*e-a*e*exp(d*x+c))*x/(b*e-2*a*e*exp(d*x+c)-b*e*exp(2*d*x+2*c)),x,meth
od=_RETURNVERBOSE)
```

```
[Out] 1/2*x^2-1/2/d*x*ln((exp(2*c)*exp(d*x)*b+exp(c)*a-(exp(c)^2*a^2+b^2*exp(2*c)
)^(1/2))/(exp(c)*a-(exp(c)^2*a^2+b^2*exp(2*c))^(1/2)))-1/2/d*x*ln((exp(2*c)
*exp(d*x)*b+exp(c)*a+(exp(c)^2*a^2+b^2*exp(2*c))^(1/2))/(exp(c)*a+(exp(c)^2
*a^2+b^2*exp(2*c))^(1/2)))-1/2/d^2*dilog((exp(2*c)*exp(d*x)*b+exp(c)*a+(exp
(c)^2*a^2+b^2*exp(2*c))^(1/2))/(exp(c)*a+(exp(c)^2*a^2+b^2*exp(2*c))^(1/2))
)-1/2/d^2*dilog((exp(2*c)*exp(d*x)*b+exp(c)*a-(exp(c)^2*a^2+b^2*exp(2*c))^(
1/2))/(exp(c)*a-(exp(c)^2*a^2+b^2*exp(2*c))^(1/2)))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*e-a*e*exp(d*x+c))*x/(b*e-2*a*e*exp(d*x+c)-b*e*exp(2*d*x+2*c)),
x, algorithm="maxima")
```

```
[Out] integrate((a*e*e^(d*x + c) - b*e)*x/(b*e*e^(2*d*x + 2*c) + 2*a*e*e^(d*x + c
) - b*e), x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 293 vs. $2(126) = 252$.

time = 0.36, size = 293, normalized size = 1.95

$$\frac{d^2x^2 + (c+1)\log\left(2\,b\sqrt{\frac{a^2+b^2}{b^2}}\,e + 2\,ae + 2\,be^{(dx+c+1)}\right) + (c+1)\log\left(-2\,b\sqrt{\frac{a^2+b^2}{b^2}}\,e + 2\,ae + 2\,be^{(dx+c+1)}\right) - (dx+c+1)\log\left(\frac{\left(b\sqrt{\frac{a^2+b^2}{b^2}}\,e^{(dx+c+1)}+be-ae^{(dx+c+1)}\right)e^{(-1)}}{b}\right) - (dx+c+1)\log\left(-\frac{\left(b\sqrt{\frac{a^2+b^2}{b^2}}\,e^{(dx+c+1)}-be+ae^{(dx+c+1)}\right)e^{(-1)}}{b}\right) - \mathrm{Li}_2\left(-\frac{\left(b\sqrt{\frac{a^2+b^2}{b^2}}\,e^{(dx+c+1)}+be-ae^{(dx+c+1)}\right)e^{(-1)}}{b}+1\right) - \mathrm{Li}_2\left(\frac{\left(b\sqrt{\frac{a^2+b^2}{b^2}}\,e^{(dx+c+1)}-be+ae^{(dx+c+1)}\right)e^{(-1)}}{b}+1\right)}{2\,d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*e-a*e*exp(d*x+c))*x/(b*e-2*a*e*exp(d*x+c)-b*e*exp(2*d*x+2*c)),
x, algorithm="fricas")
```

```
[Out] 1/2*(d^2*x^2 + (c + 1)*log(2*b*sqrt((a^2 + b^2)/b^2)*e + 2*a*e + 2*b*e^(d*x
 + c + 1)) + (c + 1)*log(-2*b*sqrt((a^2 + b^2)/b^2)*e + 2*a*e + 2*b*e^(d*x
+ c + 1)) - (d*x + c + 1)*log((b*sqrt((a^2 + b^2)/b^2)*e^(d*x + c + 1) + b*
e - a*e^(d*x + c + 1))*e^(-1)/b) - (d*x + c + 1)*log(-(b*sqrt((a^2 + b^2)/b
^2)*e^(d*x + c + 1) - b*e + a*e^(d*x + c + 1))*e^(-1)/b) - dilog(-(b*sqrt((
a^2 + b^2)/b^2)*e^(d*x + c + 1) + b*e - a*e^(d*x + c + 1))*e^(-1)/b + 1) -
dilog((b*sqrt((a^2 + b^2)/b^2)*e^(d*x + c + 1) - b*e + a*e^(d*x + c + 1))*e
^(-1)/b + 1))/d^2
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\left(ae^{c}e^{dx} - b\right)}{2ae^{c}e^{dx} + be^{2c}e^{2dx} - b}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*e-a*e*exp(d*x+c))*x/(b*e-2*a*e*exp(d*x+c)-b*e*exp(2*d*x+2*c)),
x)
```

```
[Out] Integral(x*(a*exp(c)*exp(d*x) - b)/(2*a*exp(c)*exp(d*x) + b*exp(2*c)*exp(2*
d*x) - b), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*e-a*e*exp(d*x+c))*x/(b*e-2*a*e*exp(d*x+c)-b*e*exp(2*d*x+2*c)),
x, algorithm="giac")
```

```
[Out] integrate((b*e - a*e^(d*x + c + 1))*x/(b*e - b*e^(2*d*x + 2*c + 1) - 2*a*e^
(d*x + c + 1)), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int -\frac{x\,\left(b\,e-a\,e\,\mathrm{e}^{c+d\,x}\right)}{2\,a\,e\,\mathrm{e}^{c+d\,x}-b\,e+b\,e\,\mathrm{e}^{2\,c+2\,d\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(x*(b*e - a*e*exp(c + d*x)))/(2*a*e*exp(c + d*x) - b*e + b*e*exp(2*c +
 2*d*x)),x)
```

```
[Out] int(-(x*(b*e - a*e*exp(c + d*x)))/(2*a*e*exp(c + d*x) - b*e + b*e*exp(2*c +
 2*d*x)), x)
```

3.579 $\int F^{a+b\log(c+dx^n)}x^2\,dx$

Optimal. Leaf size=65

$$\frac{1}{3}F^a x^3 (c+dx^n)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}{}_2F_1\left(\frac{3}{n},-b\log(F);\frac{3+n}{n};-\frac{dx^n}{c}\right)$$

```
[Out] 1/3*F^a*x^3*(c+d*x^n)^(b*ln(F))*hypergeom([3/n, -b*ln(F)],[(3+n)/n],-d*x^n/
c)/((1+d*x^n/c)^(b*ln(F)))
```

Rubi [A]
time = 0.04, antiderivative size = 65, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {2306, 12, 372, 371}

$$\frac{1}{3}x^3 F^a (c+dx^n)^{b\log(F)}\left(\frac{dx^n}{c}+1\right)^{-b\log(F)}{}_2F_1\left(\frac{3}{n},-b\log(F);\frac{n+3}{n};-\frac{dx^n}{c}\right)$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*Log[c + d*x^n])*x^2,x]
```

```
[Out] (F^a*x^3*(c + d*x^n)^(b*Log[F])*Hypergeometric2F1[3/n, -(b*Log[F]), (3 + n)
/n, -((d*x^n)/c)])/(3*(1 + (d*x^n)/c)^(b*Log[F]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 372

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[a^I
ntPart[p]*((a + b*x^n)^FracPart[p]/(1 + b*(x^n/a))^FracPart[p]), Int[(c*x)^
m*(1 + b*(x^n/a))^p, x], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0]
 &&  !(ILtQ[p, 0] || GtQ[a, 0])
```

Rule 2306

```
Int[(u_.)*(F_)^((a_.)*(Log[z_]*(b_.) + (v_.))), x_Symbol] :> Int[u*F^(a*v)*
z^(a*b*Log[F]), x] /; FreeQ[{F, a, b}, x]
```

Rubi steps

$$\begin{aligned}\int F^{a+b\log(c+dx^n)}x^2\,dx &= \int F^a x^2(c+dx^n)^{b\log(F)}\,dx\\ &= F^a\int x^2(c+dx^n)^{b\log(F)}\,dx\\ &= \left(F^a(c+dx^n)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}\right)\int x^2\left(1+\frac{dx^n}{c}\right)^{b\log(F)}\,dx\\ &= \frac{1}{3}F^a x^3(c+dx^n)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}\,{}_2F_1\left(\frac{3}{n},-b\log(F);\frac{3+n}{n};-\frac{dx^n}{c}\right)\end{aligned}$$

Mathematica [A]
time = 0.15, size = 85, normalized size = 1.31

$$-\frac{F^{a+b\log(c+dx^n)}x^3\left(-\frac{dx^n}{c}\right)^{-3/n}(c+dx^n)\,{}_2F_1\left(\frac{-3+n}{n},1+b\log(F);2+b\log(F);1+\frac{dx^n}{c}\right)}{cn(1+b\log(F))}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*Log[c + d*x^n])*x^2,x]
[Out] -((F^(a + b*Log[c + d*x^n])*x^3*(c + d*x^n)*Hypergeometric2F1[(-3 + n)/n, 1
 + b*Log[F], 2 + b*Log[F], 1 + (d*x^n)/c])/(c*n*(-((d*x^n)/c))^(3/n)*(1 + b
*Log[F])))
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int F^{a+b\ln(c+d\,x^n)}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*ln(c+d*x^n))*x^2,x)
[Out] int(F^(a+b*ln(c+d*x^n))*x^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))*x^2,x, algorithm="maxima")
```

```
[Out] integrate(F^(b*log(d*x^n + c) + a)*x^2, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))*x^2,x, algorithm="fricas")
[Out] integral(F^(b*log(d*x^n + c) + a)*x^2, x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*ln(c+d*x**n))*x**2,x)
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))*x^2,x, algorithm="giac")
[Out] integrate(F^(b*log(d*x^n + c) + a)*x^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int F^{a+b\,\ln(c+d\,x^n)}\,x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*log(c + d*x^n))*x^2,x)
[Out] int(F^(a + b*log(c + d*x^n))*x^2, x)
```

3.580 $\int F^{a+b\log(c+dx^n)}x\,dx$

Optimal. Leaf size=65

$$\frac{1}{2}F^a x^2 (c+dx^n)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}\,{}_2F_1\left(\frac{2}{n},-b\log(F);\frac{2+n}{n};-\frac{dx^n}{c}\right)$$

```
[Out] 1/2*F^a*x^2*(c+d*x^n)^(b*ln(F))*hypergeom([2/n, -b*ln(F)],[(2+n)/n],-d*x^n/
c)/((1+d*x^n/c)^(b*ln(F)))
```

Rubi [A]
time = 0.02, antiderivative size = 65, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.250$, Rules used = {2306, 12, 372, 371}

$$\frac{1}{2}x^2 F^a (c+dx^n)^{b\log(F)}\left(\frac{dx^n}{c}+1\right)^{-b\log(F)}\,{}_2F_1\left(\frac{2}{n},-b\log(F);\frac{n+2}{n};-\frac{dx^n}{c}\right)$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*Log[c + d*x^n])*x,x]
```

```
[Out] (F^a*x^2*(c + d*x^n)^(b*Log[F])*Hypergeometric2F1[2/n, -(b*Log[F]), (2 + n)
/n, -((d*x^n)/c)])/(2*(1 + (d*x^n)/c)^(b*Log[F]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 372

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[a^I
ntPart[p]*((a + b*x^n)^FracPart[p]/(1 + b*(x^n/a))^FracPart[p]), Int[(c*x)^
m*(1 + b*(x^n/a))^p, x], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0]
 &&  !(ILtQ[p, 0] || GtQ[a, 0])
```

Rule 2306

```
Int[(u_.)*(F_)^((a_.)*(Log[z_]*(b_.) + (v_.))), x_Symbol] :> Int[u*F^(a*v)*
z^(a*b*Log[F]), x] /; FreeQ[{F, a, b}, x]
```

Rubi steps

$$\begin{aligned}\int F^{a+b\log(c+dx^n)}x\,dx &= \int F^a x(c+dx^n)^{b\log(F)}\,dx\\ &= F^a\int x(c+dx^n)^{b\log(F)}\,dx\\ &= \left(F^a(c+dx^n)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}\right)\int x\left(1+\frac{dx^n}{c}\right)^{b\log(F)}\,dx\\ &= \frac{1}{2}F^a x^2(c+dx^n)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}{}_2F_1\left(\frac{2}{n},-b\log(F);\frac{2+n}{n};-\frac{dx^n}{c}\right)\end{aligned}$$

Mathematica [A]
time = 0.10, size = 85, normalized size = 1.31

$$-\frac{F^{a+b\log(c+dx^n)}x^2\left(-\frac{dx^n}{c}\right)^{-2/n}(c+dx^n)\,{}_2F_1\left(\frac{-2+n}{n},1+b\log(F);2+b\log(F);1+\frac{dx^n}{c}\right)}{cn(1+b\log(F))}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*Log[c + d*x^n])*x,x]
```

```
[Out] -((F^(a + b*Log[c + d*x^n])*x^2*(c + d*x^n)*Hypergeometric2F1[(-2 + n)/n, 1
 + b*Log[F], 2 + b*Log[F], 1 + (d*x^n)/c])/(c*n*(-((d*x^n)/c))^(2/n)*(1 + b
*Log[F])))
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int F^{a+b\ln(c+d\,x^n)}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*ln(c+d*x^n))*x,x)
```

```
[Out] int(F^(a+b*ln(c+d*x^n))*x,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))*x,x, algorithm="maxima")
```

```
[Out] integrate(F^(b*log(d*x^n + c) + a)*x, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))*x,x, algorithm="fricas")
[Out] integral(F^(b*log(d*x^n + c) + a)*x, x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*ln(c+d*x**n))*x,x)
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))*x,x, algorithm="giac")
[Out] integrate(F^(b*log(d*x^n + c) + a)*x, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int F^{a+b\,\ln\left(c+d\,x^n\right)}\,x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*log(c + d*x^n))*x,x)
[Out] int(F^(a + b*log(c + d*x^n))*x, x)
```

3.581 $\int F^{a+b\log(c+dx^n)}\,dx$

Optimal. Leaf size=56

$$F^a x(c+dx^n)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}{}_2F_1\left(\frac{1}{n},-b\log(F);1+\frac{1}{n};-\frac{dx^n}{c}\right)$$

```
[Out] F^a*x*(c+d*x^n)^(b*ln(F))*hypergeom([1/n, -b*ln(F)],[1+1/n],-d*x^n/c)/((1+d
*x^n/c)^(b*ln(F)))
```

Rubi [A]
time = 0.02, antiderivative size = 56, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2306, 12, 252, 251}

$$xF^a(c+dx^n)^{b\log(F)}\left(\frac{dx^n}{c}+1\right)^{-b\log(F)}{}_2F_1\left(\frac{1}{n},-b\log(F);1+\frac{1}{n};-\frac{dx^n}{c}\right)$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*Log[c + d*x^n]),x]
```

```
[Out] (F^a*x*(c + d*x^n)^(b*Log[F])*Hypergeometric2F1[n^(-1), -(b*Log[F]), 1 + n^
(-1), -((d*x^n)/c)])/(1 + (d*x^n)/c)^(b*Log[F])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 251

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p*x*Hypergeometric2F
1[-p, 1/n, 1/n + 1, (-b)*(x^n/a)], x] /; FreeQ[{a, b, n, p}, x] && !IGtQ[p
, 0] && !IntegerQ[1/n] && !ILtQ[Simplify[1/n + p], 0] && (IntegerQ[p] ||
GtQ[a, 0])
```

Rule 252

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[a^IntPart[p]*((a + b*x
^n)^FracPart[p]/(1 + b*(x^n/a))^FracPart[p]), Int[(1 + b*(x^n/a))^p, x], x]
 /; FreeQ[{a, b, n, p}, x] && !IGtQ[p, 0] && !IntegerQ[1/n] && !ILtQ[Sim
plify[1/n + p], 0] && !(IntegerQ[p] || GtQ[a, 0])
```

Rule 2306

```
Int[(u_.)*(F_)^((a_.)*(Log[z_]*(b_.) + (v_.))), x_Symbol] :> Int[u*F^(a*v)*
z^(a*b*Log[F]), x] /; FreeQ[{F, a, b}, x]
```

Rubi steps

$$
\begin{aligned}
\int F^{a+b\log(c+dx^n)}\,dx &= \int F^a(c+dx^n)^{b\log(F)}\,dx\\
&= F^a\int (c+dx^n)^{b\log(F)}\,dx\\
&= \left(F^a(c+dx^n)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}\right)\int \left(1+\frac{dx^n}{c}\right)^{b\log(F)}\,dx\\
&= F^a x(c+dx^n)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}\,{}_2F_1\left(\frac{1}{n},-b\log(F);1+\frac{1}{n};-\frac{dx^n}{c}\right)
\end{aligned}
$$

Mathematica [**A**]
time = 0.09, size = 83, normalized size = 1.48

$$
-\frac{F^{a+b\log(c+dx^n)}x\left(-\frac{dx^n}{c}\right)^{-1/n}(c+dx^n)\,{}_2F_1\left(\frac{-1+n}{n},1+b\log(F);2+b\log(F);1+\frac{dx^n}{c}\right)}{cn(1+b\log(F))}
$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*Log[c + d*x^n]),x]
```

```
[Out] -((F^(a + b*Log[c + d*x^n])*x*(c + d*x^n)*Hypergeometric2F1[(-1 + n)/n, 1 +
 b*Log[F], 2 + b*Log[F], 1 + (d*x^n)/c])/(c*n*(-((d*x^n)/c))^n^(-1)*(1 + b*
Log[F])))
```

Maple [**F**]
time = 0.03, size = 0, normalized size = 0.00

$$
\int F^{a+b\ln(c+d\,x^n)}\,dx
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*ln(c+d*x^n)),x)
```

```
[Out] int(F^(a+b*ln(c+d*x^n)),x)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n)),x, algorithm="maxima")
```

```
[Out] integrate(F^(b*log(d*x^n + c) + a), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n)),x, algorithm="fricas")
[Out] integral(F^(b*log(d*x^n + c) + a), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*ln(c+d*x**n)),x)
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n)),x, algorithm="giac")
[Out] integrate(F^(b*log(d*x^n + c) + a), x)
```

Mupad [B]
time = 4.01, size = 58, normalized size = 1.04

$$\frac{F^a\,x\,{\left(c+d\,x^n\right)}^{b\,\ln\left(F\right)}\,{}_2\mathrm{F}_1\left(\frac{1}{n},-b\,\ln\left(F\right);\ \frac{1}{n}+1;\ -\frac{d\,x^n}{c}\right)}{{\left(\frac{d\,x^n}{c}+1\right)}^{b\,\ln\left(F\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*log(c + d*x^n)),x)
[Out] (F^a*x*(c + d*x^n)^(b*log(F))*hypergeom([1/n, -b*log(F)], 1/n + 1, -(d*x^n)
/c))/((d*x^n)/c + 1)^(b*log(F))
```

3.582 $\int \frac{F^{a+b\log(c+dx^n)}}{x}\,dx$

Optimal. Leaf size=57

$$-\frac{F^a(c+dx^n)^{1+b\log(F)}\,{}_2F_1\left(1,1+b\log(F);2+b\log(F);1+\frac{dx^n}{c}\right)}{cn(1+b\log(F))}$$

```
[Out] -F^a*(c+d*x^n)^(1+b*ln(F))*hypergeom([1, 1+b*ln(F)],[2+b*ln(F)],1+d*x^n/c)/
c/n/(1+b*ln(F))
```

Rubi [A]
time = 0.04, antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {2306, 12, 272, 67}

$$-\frac{F^a(c+dx^n)^{b\log(F)+1}\,{}_2F_1\left(1,b\log(F)+1;b\log(F)+2;\frac{dx^n}{c}+1\right)}{cn(b\log(F)+1)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*Log[c + d*x^n])/x,x]
```

```
[Out] -((F^a*(c + d*x^n)^(1 + b*Log[F])*Hypergeometric2F1[1, 1 + b*Log[F], 2 + b*
Log[F], 1 + (d*x^n)/c])/(c*n*(1 + b*Log[F])))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 67

```
Int[((b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((c + d*x
)^(n + 1)/(d*(n + 1)*(-d/(b*c))^m))*Hypergeometric2F1[-m, n + 1, n + 2, 1 +
 d*(x/c)], x] /; FreeQ[{b, c, d, m, n}, x] &&  !IntegerQ[n] && (IntegerQ[m]
 || GtQ[-d/(b*c), 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2306

```
Int[(u_.)*(F_)^((a_.)*(Log[z_]*(b_.) + (v_.))), x_Symbol] :> Int[u*F^(a*v)*
z^(a*b*Log[F]), x] /; FreeQ[{F, a, b}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{F^{a+b\log(c+dx^n)}}{x}\,dx &= \int \frac{F^a(c+dx^n)^{b\log(F)}}{x}\,dx\\ &= F^a\int \frac{(c+dx^n)^{b\log(F)}}{x}\,dx\\ &= \frac{F^a\text{Subst}\left(\int \frac{(c+dx)^{b\log(F)}}{x}\,dx,x,x^n\right)}{n}\\ &= -\frac{F^a(c+dx^n)^{1+b\log(F)}\,{}_2F_1\left(1,1+b\log(F);2+b\log(F);1+\frac{dx^n}{c}\right)}{cn(1+b\log(F))}\end{aligned}$$

Mathematica [A]
time = 0.09, size = 50, normalized size = 0.88

$$-\frac{F^{a+b\log(c+dx^n)}\left(-1+\,{}_2F_1\left(1,b\log(F);1+b\log(F);1+\frac{dx^n}{c}\right)\right)}{bn\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*Log[c + d*x^n])/x,x]
```

```
[Out] -((F^(a + b*Log[c + d*x^n])*(-1 + Hypergeometric2F1[1, b*Log[F], 1 + b*Log[
F], 1 + (d*x^n)/c]))/(b*n*Log[F]))
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b\ln(c+d\,x^n)}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*ln(c+d*x^n))/x,x)
```

```
[Out] int(F^(a+b*ln(c+d*x^n))/x,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))/x,x, algorithm="maxima")
```

```
[Out] integrate(F^(b*log(d*x^n + c) + a)/x, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))/x,x, algorithm="fricas")
[Out] integral(F^(b*log(d*x^n + c) + a)/x, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b\log{(c+dx^n)}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*ln(c+d*x**n))/x,x)
[Out] Integral(F**(a + b*log(c + d*x**n))/x, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))/x,x, algorithm="giac")
[Out] integrate(F^(b*log(d*x^n + c) + a)/x, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{F^{a+b\,\ln(c+d\,x^n)}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*log(c + d*x^n))/x,x)
[Out] int(F^(a + b*log(c + d*x^n))/x, x)
```

3.583 $\int \frac{F^{a+b\log(c+dx^n)}}{x^2}\,dx$

Optimal. Leaf size=66

$$-\frac{F^a(c+dx^n)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}{}_2F_1\left(-\frac{1}{n},-b\log(F);-\frac{1-n}{n};-\frac{dx^n}{c}\right)}{x}$$

```
[Out] -F^a*(c+d*x^n)^(b*ln(F))*hypergeom([-1/n, -b*ln(F)],[(-1+n)/n],-d*x^n/c)/x/
((1+d*x^n/c)^(b*ln(F)))
```

Rubi [A]
time = 0.03, antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {2306, 12, 372, 371}

$$-\frac{F^a(c+dx^n)^{b\log(F)}\left(\frac{dx^n}{c}+1\right)^{-b\log(F)}{}_2F_1\left(-\frac{1}{n},-b\log(F);-\frac{1-n}{n};-\frac{dx^n}{c}\right)}{x}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*Log[c + d*x^n])/x^2,x]
```

```
[Out] -((F^a*(c + d*x^n)^(b*Log[F])*Hypergeometric2F1[-n^(-1), -(b*Log[F]), -((1
- n)/n), -((d*x^n)/c)])/(x*(1 + (d*x^n)/c)^(b*Log[F])))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 372

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[a^I
ntPart[p]*((a + b*x^n)^FracPart[p]/(1 + b*(x^n/a))^FracPart[p]), Int[(c*x)^
m*(1 + b*(x^n/a))^p, x], x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0]
 && !(ILtQ[p, 0] || GtQ[a, 0])
```

Rule 2306

```
Int[(u_.)*(F_)^((a_.)*(Log[z_]*(b_.) + (v_.))), x_Symbol] :> Int[u*F^(a*v)*
z^(a*b*Log[F]), x] /; FreeQ[{F, a, b}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{F^{a+b\log(c+dx^n)}}{x^2}\,dx &= \int \frac{F^a(c+dx^n)^{b\log(F)}}{x^2}\,dx\\
&= F^a\int \frac{(c+dx^n)^{b\log(F)}}{x^2}\,dx\\
&= \left(F^a(c+dx^n)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}\right)\int \frac{\left(1+\frac{dx^n}{c}\right)^{b\log(F)}}{x^2}\,dx\\
&= -\frac{F^a(c+dx^n)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}\,{}_2F_1\left(-\frac{1}{n},-b\log(F);-\frac{1-n}{n};-\frac{dx^n}{c}\right)}{x}
\end{aligned}$$

Mathematica [A]
time = 0.11, size = 81, normalized size = 1.23

$$-\frac{F^{a+b\log(c+dx^n)}\left(-\frac{dx^n}{c}\right)^{\frac{1}{n}}(c+dx^n)\,{}_2F_1\left(1+\frac{1}{n},1+b\log(F);2+b\log(F);1+\frac{dx^n}{c}\right)}{cnx(1+b\log(F))}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*Log[c + d*x^n])/x^2,x]
```

```
[Out] -((F^(a + b*Log[c + d*x^n])*(-((d*x^n)/c))^n^(-1)*(c + d*x^n)*Hypergeometri
c2F1[1 + n^(-1), 1 + b*Log[F], 2 + b*Log[F], 1 + (d*x^n)/c])/(c*n*x*(1 + b*
Log[F])))
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b\ln(c+d\,x^n)}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*ln(c+d*x^n))/x^2,x)
```

```
[Out] int(F^(a+b*ln(c+d*x^n))/x^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))/x^2,x, algorithm="maxima")
[Out] integrate(F^(b*log(d*x^n + c) + a)/x^2, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))/x^2,x, algorithm="fricas")
[Out] integral(F^(b*log(d*x^n + c) + a)/x^2, x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*ln(c+d*x**n))/x**2,x)
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))/x^2,x, algorithm="giac")
[Out] integrate(F^(b*log(d*x^n + c) + a)/x^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{F^{a+b\,\ln(c+d\,x^n)}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*log(c + d*x^n))/x^2,x)
[Out] int(F^(a + b*log(c + d*x^n))/x^2, x)
```

3.584 $\int \frac{F^{a+b\log(c+dx^n)}}{x^3} \, dx$

Optimal. Leaf size=68

$$-\frac{F^a(c+dx^n)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)} {}_2F_1\left(-\frac{2}{n},-b\log(F);-\frac{2-n}{n};-\frac{dx^n}{c}\right)}{2x^2}$$

```
[Out] -1/2*F^a*(c+d*x^n)^(b*ln(F))*hypergeom([-2/n, -b*ln(F)],[(-2+n)/n],-d*x^n/c
)/x^2/((1+d*x^n/c)^(b*ln(F)))
```

Rubi [A]
time = 0.03, antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {2306, 12, 372, 371}

$$-\frac{F^a(c+dx^n)^{b\log(F)}\left(\frac{dx^n}{c}+1\right)^{-b\log(F)} {}_2F_1\left(-\frac{2}{n},-b\log(F);-\frac{2-n}{n};-\frac{dx^n}{c}\right)}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*Log[c + d*x^n])/x^3,x]
```

```
[Out] -1/2*(F^a*(c + d*x^n)^(b*Log[F])*Hypergeometric2F1[-2/n, -(b*Log[F]), -((2
- n)/n), -((d*x^n)/c)])/(x^2*(1 + (d*x^n)/c)^(b*Log[F]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 372

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[a^I
ntPart[p]*((a + b*x^n)^FracPart[p]/(1 + b*(x^n/a))^FracPart[p]), Int[(c*x)^
m*(1 + b*(x^n/a))^p, x], x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0]
 && !(ILtQ[p, 0] || GtQ[a, 0])
```

Rule 2306

```
Int[(u_.)*(F_)^((a_.)*(Log[z_]*(b_.) + (v_.))), x_Symbol] :> Int[u*F^(a*v)*
z^(a*b*Log[F]), x] /; FreeQ[{F, a, b}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{F^{a+b\log(c+dx^n)}}{x^3}\,dx &= \int \frac{F^a(c+dx^n)^{b\log(F)}}{x^3}\,dx\\ &= F^a\int \frac{(c+dx^n)^{b\log(F)}}{x^3}\,dx\\ &= \left(F^a(c+dx^n)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}\right)\int \frac{\left(1+\frac{dx^n}{c}\right)^{b\log(F)}}{x^3}\,dx\\ &= -\frac{F^a(c+dx^n)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}\,{}_2F_1\left(-\frac{2}{n},-b\log(F);-\frac{2-n}{n};-\frac{dx^n}{c}\right)}{2x^2}\end{aligned}$$

Mathematica [A]
time = 0.11, size = 85, normalized size = 1.25

$$-\frac{F^{a+b\log(c+dx^n)}\left(-\frac{dx^n}{c}\right)^{2/n}(c+dx^n)\,{}_2F_1\left(\frac{2+n}{n},1+b\log(F);2+b\log(F);1+\frac{dx^n}{c}\right)}{cnx^2(1+b\log(F))}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*Log[c + d*x^n])/x^3,x]
```

```
[Out] -((F^(a + b*Log[c + d*x^n])*(-((d*x^n)/c))^(2/n)*(c + d*x^n)*Hypergeometric
2F1[(2 + n)/n, 1 + b*Log[F], 2 + b*Log[F], 1 + (d*x^n)/c])/(c*n*x^2*(1 + b*
Log[F])))
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b\ln(c+d\,x^n)}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*ln(c+d*x^n))/x^3,x)
```

```
[Out] int(F^(a+b*ln(c+d*x^n))/x^3,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))/x^3,x, algorithm="maxima")
```

```
[Out] integrate(F^(b*log(d*x^n + c) + a)/x^3, x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))/x^3,x, algorithm="fricas")
```

```
[Out] integral(F^(b*log(d*x^n + c) + a)/x^3, x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*ln(c+d*x**n))/x**3,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))/x^3,x, algorithm="giac")
```

```
[Out] integrate(F^(b*log(d*x^n + c) + a)/x^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{F^{a+b\,\ln\left(c+d\,x^n\right)}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*log(c + d*x^n))/x^3,x)
```

```
[Out] int(F^(a + b*log(c + d*x^n))/x^3, x)
```

3.585 $\int F^{a+b\log(c+dx^n)}(dx)^m\,dx$

Optimal. Leaf size=77

$$\frac{F^a(dx)^{1+m}\left(c+dx^n\right)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}{}_2F_1\left(\frac{1+m}{n},-b\log(F);\frac{1+m+n}{n};-\frac{dx^n}{c}\right)}{d(1+m)}$$

[Out] F^a*(d*x)^(1+m)*(c+d*x^n)^(b*ln(F))*hypergeom([(1+m)/n, -b*ln(F)],[(1+m+n)/n],-d*x^n/c)/d/(1+m)/((1+d*x^n/c)^(b*ln(F)))

Rubi [A]
time = 0.04, antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2306, 12, 372, 371}

$$\frac{F^a(dx)^{m+1}\left(c+dx^n\right)^{b\log(F)}\left(\frac{dx^n}{c}+1\right)^{-b\log(F)}{}_2F_1\left(\frac{m+1}{n},-b\log(F);\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{d(m+1)}$$

Antiderivative was successfully verified.

[In] Int[F^(a + b*Log[c + d*x^n])*(d*x)^m,x]

[Out] (F^a*(d*x)^(1 + m)*(c + d*x^n)^(b*Log[F])*Hypergeometric2F1[(1 + m)/n, -(b*Log[F]), (1 + m + n)/n, -((d*x^n)/c)])/(d*(1 + m)*(1 + (d*x^n)/c)^(b*Log[F]))

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 371

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 372

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[a^I
ntPart[p]*((a + b*x^n)^FracPart[p]/(1 + b*(x^n/a))^FracPart[p]), Int[(c*x)^
m*(1 + b*(x^n/a))^p, x], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0]
 &&  !(ILtQ[p, 0] || GtQ[a, 0])
```

Rule 2306

```
Int[(u_.)*(F_)^((a_.)*(Log[z_]*(b_.) + (v_.))), x_Symbol] :> Int[u*F^(a*v)*
z^(a*b*Log[F]), x] /; FreeQ[{F, a, b}, x]
```

Rubi steps

$$\begin{aligned}\int F^{a+b\log(c+dx^n)}(dx)^m\,dx &= \int F^a(dx)^m\left(c+dx^n\right)^{b\log(F)}\,dx\\ &= F^a\int (dx)^m\left(c+dx^n\right)^{b\log(F)}\,dx\\ &= \left(F^a(c+dx^n)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}\right)\int (dx)^m\left(1+\frac{dx^n}{c}\right)^{b\log(F)}\,dx\\ &= \frac{F^a(dx)^{1+m}\left(c+dx^n\right)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}\,{}_2F_1\left(\frac{1+m}{n},-b\log(F);\frac{1+m+n}{n};-\frac{dx^n}{c}\right)}{d(1+m)}\end{aligned}$$

Mathematica [A]
time = 0.15, size = 94, normalized size = 1.22

$$-\frac{F^{a+b\log(c+dx^n)}x(dx)^m\left(-\frac{dx^n}{c}\right)^{-\frac{1+m}{n}}(c+dx^n)\,{}_2F_1\left(1-\frac{1+m}{n},1+b\log(F);2+b\log(F);1+\frac{dx^n}{c}\right)}{cn(1+b\log(F))}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*Log[c + d*x^n])*(d*x)^m,x]
```

```
[Out] -((F^(a + b*Log[c + d*x^n])*x*(d*x)^m*(c + d*x^n)*Hypergeometric2F1[1 - (1
+ m)/n, 1 + b*Log[F], 2 + b*Log[F], 1 + (d*x^n)/c])/(c*n*(-((d*x^n)/c))^((1
 + m)/n)*(1 + b*Log[F])))
```

Maple [F]
time = 0.04, size = 0, normalized size = 0.00

$$\int F^{a+b\ln(c+d\,x^n)}(dx)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*ln(c+d*x^n))*(d*x)^m,x)
```

```
[Out] int(F^(a+b*ln(c+d*x^n))*(d*x)^m,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))*(d*x)^m,x, algorithm="maxima")
```

```
[Out] integrate((d*x)^m*F^(b*log(d*x^n + c) + a), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))*(d*x)^m,x, algorithm="fricas")
```

```
[Out] integral((d*x)^m*F^(b*log(d*x^n + c) + a), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*ln(c+d*x**n))*(d*x)**m,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))*(d*x)^m,x, algorithm="giac")
```

```
[Out] integrate((d*x)^m*F^(b*log(d*x^n + c) + a), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int F^{a+b\,\ln\left(c+d\,x^n\right)}\,{\left(d\,x\right)}^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*log(c + d*x^n))*(d*x)^m,x)
```

```
[Out] int(F^(a + b*log(c + d*x^n))*(d*x)^m, x)
```

3.586 $\int e^{\log^2((d+ex)^n)}(d+ex)^m\,dx$

Optimal. Leaf size=76

$$\frac{e^{-\frac{(1+m)^2}{4n^2}}\sqrt{\pi}\,(d+ex)^{1+m}\left((d+ex)^n\right)^{-\frac{1+m}{n}}\operatorname{erfi}\left(\frac{1+m+2n\log((d+ex)^n)}{2n}\right)}{2en}$$

```
[Out] 1/2*(e*x+d)^(1+m)*erfi(1/2*(1+m+2*n*ln((e*x+d)^n))/n)*Pi^(1/2)/e/exp(1/4*(1
+m)^2/n^2)/n/(((e*x+d)^n)^((1+m)/n))
```

Rubi [A]
time = 0.04, antiderivative size = 76, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.150$, Rules used = {2308, 2266, 2235}

$$\frac{\sqrt{\pi}\,e^{-\frac{(m+1)^2}{4n^2}}(d+ex)^{m+1}\left((d+ex)^n\right)^{-\frac{m+1}{n}}\operatorname{Erfi}\left(\frac{2n\log((d+ex)^n)+m+1}{2n}\right)}{2en}$$

Antiderivative was successfully verified.

```
[In] Int[E^Log[(d + e*x)^n]^2*(d + e*x)^m,x]
```

```
[Out] (Sqrt[Pi]*(d + e*x)^(1 + m)*Erfi[(1 + m + 2*n*Log[(d + e*x)^n])/(2*n)])/(2*
e*E^((1 + m)^2/(4*n^2))*n*((d + e*x)^n)^((1 + m)/n))
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2308

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^(m + 1)/(h*n*(c*(d +
e*x)^n)^((m + 1)/n)), Subst[Int[E^(a*f*Log[F] + ((m + 1)*x)/n + b*f*Log[F]*
x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m
, n}, x] && EqQ[e*g - d*h, 0]
```

Rubi steps

$$\int e^{\log^2((d+ex)^n)}(d+ex)^m\,dx = \frac{\text{Subst}\left(\int e^{\log^2(x^n)}x^m\,dx, x, d+ex\right)}{e}$$
$$= \frac{\left((d+ex)^{1+m}((d+ex)^n)^{-\frac{1+m}{n}}\right)\text{Subst}\left(\int e^{\frac{(1+m)x}{n}+x^2}\,dx, x, \log((d+ex)^n)\right)}{en}$$
$$= \frac{\left(e^{-\frac{(1+m)^2}{4n^2}}(d+ex)^{1+m}((d+ex)^n)^{-\frac{1+m}{n}}\right)\text{Subst}\left(\int e^{\frac{1}{4}\left(\frac{1+m}{n}+2x\right)^2}\,dx, x, \log((d+\right.}{en}$$
$$= \frac{e^{-\frac{(1+m)^2}{4n^2}}\sqrt{\pi}\,(d+ex)^{1+m}((d+ex)^n)^{-\frac{1+m}{n}}\,\text{erfi}\left(\frac{1+m+2n\log((d+ex)^n)}{2n}\right)}{2en}$$

Mathematica [F]
time = 0.06, size = 0, normalized size = 0.00

$$\int e^{\log^2((d+ex)^n)}(d+ex)^m\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[E^Log[(d + e*x)^n]^2*(d + e*x)^m,x]
[Out] Integrate[E^Log[(d + e*x)^n]^2*(d + e*x)^m, x]
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int e^{\ln((ex+d)^n)^2}(ex+d)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(ln((e*x+d)^n)^2)*(e*x+d)^m,x)
[Out] int(exp(ln((e*x+d)^n)^2)*(e*x+d)^m,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(log((e*x+d)^n)^2)*(e*x+d)^m,x, algorithm="maxima")
[Out] integrate((e*x + d)^m*e^(log((e*x + d)^n)^2), x)
```

Fricas [A]
time = 0.42, size = 55, normalized size = 0.72

$$\frac{\sqrt{\pi}\,\sqrt{n^2}\,\operatorname{erfi}\left(\frac{\left(2\,n^2\log\left(xe+d\right)+m+1\right)\sqrt{n^2}}{2\,n^2}\right)e^{\left(-\frac{m^2+2\,m+1}{4\,n^2}-1\right)}}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(log((e*x+d)^n)^2)*(e*x+d)^m,x, algorithm="fricas")
```

```
[Out] 1/2*sqrt(pi)*sqrt(n^2)*erfi(1/2*(2*n^2*log(x*e + d) + m + 1)*sqrt(n^2)/n^2)
*e^(-1/4*(m^2 + 2*m + 1)/n^2 - 1)/n
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d+ex\right)^m e^{\log\left(\left(d+ex\right)^n\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(ln((e*x+d)**n)**2)*(e*x+d)**m,x)
```

```
[Out] Integral((d + e*x)**m*exp(log((d + e*x)**n)**2), x)
```

Giac [C] Result contains complex when optimal does not.
time = 5.00, size = 53, normalized size = 0.70

$$-\frac{i\,\sqrt{\pi}\,\operatorname{erf}\left(i\,n\log\left(xe+d\right)+\frac{i\,m}{2\,n}+\frac{i}{2\,n}\right)e^{\left(-\frac{m^2}{4\,n^2}-\frac{m}{2\,n^2}-\frac{1}{4\,n^2}-1\right)}}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(log((e*x+d)^n)^2)*(e*x+d)^m,x, algorithm="giac")
```

```
[Out] -1/2*I*sqrt(pi)*erf(I*n*log(x*e + d) + 1/2*I*m/n + 1/2*I/n)*e^(-1/4*m^2/n^2
 - 1/2*m/n^2 - 1/4/n^2 - 1)/n
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{e}^{\ln\left(\left(d+e\,x\right)^n\right)^2}\,\left(d+e\,x\right)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(log((d + e*x)^n)^2)*(d + e*x)^m,x)
```

```
[Out] int(exp(log((d + e*x)^n)^2)*(d + e*x)^m, x)
```

3.587 $\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}(dg+egx)^m\,dx$

Optimal. Leaf size=137

$$\frac{e^{-\frac{(1+m)^2}{4bfn^2\log(F)}}F^{af}\sqrt{\pi}\,\left(c(d+ex)^n\right)^{-\frac{1+m}{n}}(dg+egx)^{1+m}\text{erfi}\left(\frac{1+m+2bfn\log(F)\log\left(c(d+ex)^n\right)}{2\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,gn\sqrt{\log(F)}}$$

```
[Out] 1/2*F^(a*f)*(e*g*x+d*g)^(1+m)*erfi(1/2*(1+m+2*b*f*n*ln(F)*ln(c*(e*x+d)^n))/
n/b^(1/2)/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/e/exp(1/4*(1+m)^2/b/f/n^2/ln(F))/g/
n/((c*(e*x+d)^n)^((1+m)/n))/b^(1/2)/f^(1/2)/ln(F)^(1/2)
```

Rubi [A]
time = 0.17, antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {2308, 2266, 2235}

$$\frac{\sqrt{\pi}\,F^{af}(dg+egx)^{m+1}e^{-\frac{(m+1)^2}{4bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-\frac{m+1}{n}}\text{Erfi}\left(\frac{2bfn\log(F)\log\left(c(d+ex)^n\right)+m+1}{2\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,gn\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(d*g + e*g*x)^m,x]
```

```
[Out] (F^(a*f)*Sqrt[Pi]*(d*g + e*g*x)^(1 + m)*Erfi[(1 + m + 2*b*f*n*Log[F]*Log[c*
(d + e*x)^n])/(2*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^((1 + m)^
2/(4*b*f*n^2*Log[F]))*Sqrt[f]*g*n*(c*(d + e*x)^n)^((1 + m)/n)*Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2308

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^(m + 1)/(h*n*(c*(d +
e*x)^n)^((m + 1)/n)), Subst[Int[E^(a*f*Log[F] + ((m + 1)*x)/n + b*f*Log[F]*
x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m
```

```
, n}, x] && EqQ[e*g - d*h, 0]
```

Rubi steps

$$\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}(dg+egx)^m\,dx=\frac{\text{Subst}\left(\int F^{f\left(a+b\log^2(cx^n)\right)}(gx)^m\,dx,x,d+ex\right)}{e}$$
$$=\frac{\left((g(d+ex))^{1+m}\left(c(d+ex)^n\right)^{-\frac{1+m}{n}}\right)\text{Subst}\left(\int e^{\frac{(1+m)x}{n}+af\log(F)+bfx^2\log\ldots}\right.}{egn}$$
$$=\frac{\left(e^{-\frac{(1+m)^2}{4bfn^2\log(F)}}F^{af}(g(d+ex))^{1+m}\left(c(d+ex)^n\right)^{-\frac{1+m}{n}}\right)\text{Subst}\left(\int e^{\frac{\left(1+\ldots\right)}{n}\ldots}\right.}{egn}$$
$$=\frac{e^{-\frac{(1+m)^2}{4bfn^2\log(F)}}F^{af}\sqrt{\pi}\,(g(d+ex))^{1+m}\left(c(d+ex)^n\right)^{-\frac{1+m}{n}}\text{erfi}\left(\frac{1+m+2bf\ldots}{2\sqrt{b}\,\ldots}\right)}{2\sqrt{b}\,e\sqrt{f}\,gn\sqrt{\log(F)}}$$

Mathematica [F]
time = 0.11, size = 0, normalized size = 0.00

$$\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}(dg+egx)^m\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(d*g + e*g*x)^m,x]
[Out] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(d*g + e*g*x)^m, x]
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int F^{f\left(a+b\ln\left(c(ex+d)^n\right)^2\right)}(egx+dg)^m\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))*(e*g*x+d*g)^m,x)
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))*(e*g*x+d*g)^m,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(e*g*x+d*g)^m,x, algorithm="maxima
")
```

```
[Out] integrate((e*g*x + d*g)^m*F^((b*log((e*x + d)^n*c)^2 + a)*f), x)
```

Fricas [A]
time = 0.38, size = 143, normalized size = 1.04

$$-\frac{\sqrt{\pi}\sqrt{-bfn^2\log(F)}\,\mathrm{erf}\left(\frac{(2\,bfn^2\log(xe+d)\log(F)+2\,bfn\log(F)\log(c)+m+1)\sqrt{-bfn^2\log(F)}}{2\,bfn^2\log(F)}\right)e^{\left(\frac{4\,abf^2n^2\log(F)^2+4\,bfmn^2\log(F)\log(g)-4\,(bfm+bf)n\log(F)\log(c)-m^2-2\,m-1}{4\,bfn^2\log(F)}-1\right)}}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(e*g*x+d*g)^m,x, algorithm="fricas
")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b*f*n^2*log(F))*erf(1/2*(2*b*f*n^2*log(x*e + d)*log(F)
+ 2*b*f*n*log(F)*log(c) + m + 1)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log(F)))*e^
(1/4*(4*a*b*f^2*n^2*log(F)^2 + 4*b*f*m*n^2*log(F)*log(g) - 4*(b*f*m + b*f)*
n*log(F)*log(c) - m^2 - 2*m - 1)/(b*f*n^2*log(F)) - 1)/n
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{f\left(a+b\log\left(c(d+ex)^n\right)^2\right)}(g(d+ex))^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))*(e*g*x+d*g)**m,x)
```

```
[Out] Integral(F**(f*(a + b*log(c*(d + e*x)**n)**2))*(g*(d + e*x))**m, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(e*g*x+d*g)^m,x, algorithm="giac")
```

```
[Out] integrate((g*x*e + d*g)^m*F^((b*log((x*e + d)^n*c)^2 + a)*f), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{e}^{f\,\ln(F)\,\left(b\ln\left(c\,(d+e\,x)^n\right)^2+a\right)}\,(d\,g+e\,g\,x)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))*(d*g + e*g*x)^m,x)
```

```
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n)^2))*(d*g + e*g*x)^m, x)
```

3.588 $\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}(dg+egx)^2\,dx$

Optimal. Leaf size=123

$$\frac{e^{-\frac{9}{4bfn^2\log(F)}}F^{af}g^2\sqrt{\pi}\,(d+ex)^3\left(c(d+ex)^n\right)^{-3/n}\operatorname{erfi}\left(\frac{3+2bfn\log(F)\log\left(c(d+ex)^n\right)}{2\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

```
[Out] 1/2*F^(a*f)*g^2*(e*x+d)^3*erfi(1/2*(3+2*b*f*n*ln(F)*ln(c*(e*x+d)^n))/n/b^(1
/2)/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/e/exp(9/4/b/f/n^2/ln(F))/n/((c*(e*x+d)^n)
^(3/n))/b^(1/2)/f^(1/2)/ln(F)^(1/2)
```

Rubi [A]

time = 0.09, antiderivative size = 123, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {2308, 2266, 2235}

$$\frac{\sqrt{\pi}\,g^2F^{af}(d+ex)^3e^{-\frac{9}{4bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-3/n}\operatorname{Erfi}\left(\frac{2bfn\log(F)\log\left(c(d+ex)^n\right)+3}{2\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(d*g + e*g*x)^2,x]
```

```
[Out] (F^(a*f)*g^2*Sqrt[Pi]*(d + e*x)^3*Erfi[(3 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^
n])/(2*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(9/(4*b*f*n^2*Log[F
]))*Sqrt[f]*n*(c*(d + e*x)^n)^(3/n)*Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2308

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^(m + 1)/(h*n*(c*(d +
e*x)^n)^((m + 1)/n)), Subst[Int[E^(a*f*Log[F] + ((m + 1)*x)/n + b*f*Log[F]*
x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m
```

```
, n}, x] && EqQ[e*g - d*h, 0]
```

Rubi steps

$$\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}(dg+egx)^2\,dx = \frac{\text{Subst}\left(\int F^{f\left(a+b\log^2(cx^n)\right)}g^2x^2\,dx,x,d+ex\right)}{e}$$
$$= \frac{g^2\text{Subst}\left(\int F^{f\left(a+b\log^2(cx^n)\right)}x^2\,dx,x,d+ex\right)}{e}$$
$$= \frac{\left(g^2(d+ex)^3\left(c(d+ex)^n\right)^{-3/n}\right)\text{Subst}\left(\int e^{\frac{3x}{n}+af\log(F)+bfx^2\log(F)}\,dx,x,$$
$$= \frac{\left(e^{-\frac{9}{4bfn^2\log(F)}}F^{af}g^2(d+ex)^3\left(c(d+ex)^n\right)^{-3/n}\right)\text{Subst}\left(\int e^{\frac{\left(\frac{3}{n}+2bfx\log(F\right.}{4bf\log(F)}}$$
$$= \frac{e^{-\frac{9}{4bfn^2\log(F)}}F^{af}g^2\sqrt{\pi}\,(d+ex)^3\left(c(d+ex)^n\right)^{-3/n}\text{erfi}\left(\frac{3+2bfn\log(F)\log(c}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log}}\right.}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

Mathematica [A]
time = 0.19, size = 123, normalized size = 1.00

$$\frac{e^{-\frac{9}{4bfn^2\log(F)}}F^{af}g^2\sqrt{\pi}\,(d+ex)^3\left(c(d+ex)^n\right)^{-3/n}\text{erfi}\left(\frac{3+2bfn\log(F)\log\left(c(d+ex)^n\right)}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(d*g + e*g*x)^2,x]
```

```
[Out] (F^(a*f)*g^2*Sqrt[Pi]*(d + e*x)^3*Erfi[(3 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^
n])/(2*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(9/(4*b*f*n^2*Log[F
]))*Sqrt[f]*n*(c*(d + e*x)^n)^(3/n)*Sqrt[Log[F]])
```

Maple [F]
time = 0.03, size = 0, normalized size = 0.00

$$\int F^{f\left(a+b\ln\left(c(ex+d)^n\right)^2\right)}(egx+dg)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))*(e*g*x+d*g)^2,x)
```

```
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))*(e*g*x+d*g)^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(e*g*x+d*g)^2,x, algorithm="maxima
")
```

```
[Out] integrate((e*g*x + d*g)^2*F^((b*log((e*x + d)^n*c)^2 + a)*f), x)
```

Fricas [A]
time = 0.36, size = 119, normalized size = 0.97

$$-\frac{\sqrt{\pi}\sqrt{-bfn^2\log(F)}\,g^2\operatorname{erf}\left(\frac{(2\,bfn^2\log(xe+d)\log(F)+2\,bfn\log(F)\log(c)+3)\sqrt{-bfn^2\log(F)}}{2\,bfn^2\log(F)}\right)e^{\left(\frac{4\,abf^2n^2\log(F)^2-12\,bfn\log(F)\log(c)-9}{4\,bfn^2\log(F)}-1\right)}}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(e*g*x+d*g)^2,x, algorithm="fricas
")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b*f*n^2*log(F))*g^2*erf(1/2*(2*b*f*n^2*log(x*e + d)*log
(F) + 2*b*f*n*log(F)*log(c) + 3)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log(F)))*e^
(1/4*(4*a*b*f^2*n^2*log(F)^2 - 12*b*f*n*log(F)*log(c) - 9)/(b*f*n^2*log(F))
 - 1)/n
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 546 vs. $2(110) = 220$.
time = 114.99, size = 546, normalized size = 4.44

$$\begin{cases} -\frac{2F^{af}F^{bf\log(c(d+ex)^n)^2}bd^3fg^2n^2\log(F)}{9e} - \frac{2F^{af}F^{bf\log(c(d+ex)^n)^2}bd^3fg^2n\log(F)\log(c(d+ex)^n)}{9e} + \frac{2F^{af}F^{bf\log(c(d+ex)^n)^2}bd^2fg^2n^2x\log(F)}{9} - \frac{2F^{af}F^{bf\log(c(d+ex)^n)^2}bd^2fg^2nx\log(F)\log(c(d+ex)^n)}{3} + \frac{2F^{af}F^{bf\log(c(d+ex)^n)^2}bdefg^2n^2x^2\log(F)}{9} - \frac{2F^{af}F^{bf\log(c(d+ex)^n)^2}bdefg^2nx^2\log(F)\log(c(d+ex)^n)}{3} + \frac{2F^{af}F^{bf\log(c(d+ex)^n)^2}be^2fg^2n^2x^3\log(F)}{27} - \frac{2F^{af}F^{bf\log(c(d+ex)^n)^2}be^2fg^2nx^3\log(F)\log(c(d+ex)^n)}{9} + \frac{F^{af}F^{bf\log(c(d+ex)^n)^2}d^3g^2}{3e} + F^{af}F^{bf\log(c(d+ex)^n)^2}d^2g^2x + F^{af}F^{bf\log(c(d+ex)^n)^2}deg^2x^2 + \frac{F^{af}F^{bf\log(c(d+ex)^n)^2}e^2g^2x^3}{3} & \text{for}\ e \neq 0 \\ F^{f\left(a+b\log(cd^n)^2\right)}d^2g^2x & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))*(e*g*x+d*g)**2,x)
```

```
[Out] Piecewise((-2*F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*d**3*f*g**2*n**2*l
og(F)/(9*e) - 2*F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*d**3*f*g**2*n*lo
g(F)*log(c*(d + e*x)**n)/(9*e) + 2*F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)
*b*d**2*f*g**2*n**2*x*log(F)/9 - 2*F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)
*b*d**2*f*g**2*n*x*log(F)*log(c*(d + e*x)**n)/3 + 2*F**(a*f)*F**(b*f*log(c*
(d + e*x)**n)**2)*b*d*e*f*g**2*n**2*x**2*log(F)/9 - 2*F**(a*f)*F**(b*f*log(
c*(d + e*x)**n)**2)*b*d*e*f*g**2*n*x**2*log(F)*log(c*(d + e*x)**n)/3 + 2*F*
*(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*e**2*f*g**2*n**2*x**3*log(F)/27 -
2*F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*e**2*f*g**2*n*x**3*log(F)*log(
```

```
c*(d + e*x)**n)/9 + F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*d**3*g**2/(3*e
) + F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*d**2*g**2*x + F**(a*f)*F**(b*f
*log(c*(d + e*x)**n)**2)*d*e*g**2*x**2 + F**(a*f)*F**(b*f*log(c*(d + e*x)**
n)**2)*e**2*g**2*x**3/3, Ne(e, 0)), (F**(f*(a + b*log(c*d**n)**2))*d**2*g**
2*x, True))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(e*g*x+d*g)^2,x, algorithm="giac")
[Out] integrate((g*x*e + d*g)^2*F^((b*log((x*e + d)^n*c)^2 + a)*f), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{e}^{f\,\ln(F)\,\left(b\ln\left(c\,(d+e\,x)^n\right)^2+a\right)}\,(d\,g+e\,g\,x)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))*(d*g + e*g*x)^2,x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n)^2))*(d*g + e*g*x)^2, x)
```

3.589 $\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}(dg+egx)\,dx$

Optimal. Leaf size=115

$$\frac{e^{-\frac{1}{bfn^2\log(F)}}F^{af}g\sqrt{\pi}\,(d+ex)^2\left(c(d+ex)^n\right)^{-2/n}\operatorname{erfi}\left(\frac{1+bfn\log(F)\log(c(d+ex)^n)}{\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

```
[Out] 1/2*F^(a*f)*g*(e*x+d)^2*erfi((1+b*f*n*ln(F)*ln(c*(e*x+d)^n))/n/b^(1/2)/f^(1
/2)/ln(F)^(1/2))*Pi^(1/2)/e/exp(1/b/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(2/n))/b^
(1/2)/f^(1/2)/ln(F)^(1/2)
```

Rubi [A]
time = 0.08, antiderivative size = 115, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$, Rules used = {2308, 2266, 2235}

$$\frac{\sqrt{\pi}\,gF^{af}(d+ex)^2e^{-\frac{1}{bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-2/n}\operatorname{Erfi}\left(\frac{bfn\log(F)\log(c(d+ex)^n)+1}{\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(d*g + e*g*x),x]
```

```
[Out] (F^(a*f)*g*Sqrt[Pi]*(d + e*x)^2*Erfi[(1 + b*f*n*Log[F]*Log[c*(d + e*x)^n])/
(Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(1/(b*f*n^2*Log[F]))*Sqrt
[f]*n*(c*(d + e*x)^n)^(2/n)*Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2308

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^(m + 1)/(h*n*(c*(d +
e*x)^n)^((m + 1)/n)), Subst[Int[E^(a*f*Log[F] + ((m + 1)*x)/n + b*f*Log[F]*
x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m
```

```
, n}, x] && EqQ[e*g - d*h, 0]
```

Rubi steps

$$\int F^{f(a+b\log^2(c(d+ex)^n))}(dg+egx)\,dx = \frac{\text{Subst}\left(\int F^{f(a+b\log^2(cx^n))}gx\,dx,x,d+ex\right)}{e}$$
$$= \frac{g\text{Subst}\left(\int F^{f(a+b\log^2(cx^n))}x\,dx,x,d+ex\right)}{e}$$
$$= \frac{\left(g(d+ex)^2\left(c(d+ex)^n\right)^{-2/n}\right)\text{Subst}\left(\int e^{\frac{2x}{n}+af\log(F)+bfx^2\log(F)}\,dx,x,\text{lo}\right.}{en}$$
$$= \frac{\left(e^{-\frac{1}{bfn^2\log(F)}}F^{af}g(d+ex)^2\left(c(d+ex)^n\right)^{-2/n}\right)\text{Subst}\left(\int e^{\frac{\left(\frac{2}{n}+2bfx\log(F)\right)^2}{4bf\log(F)}}\right.}{en}$$
$$= \frac{e^{-\frac{1}{bfn^2\log(F)}}F^{af}g\sqrt{\pi}\,(d+ex)^2\left(c(d+ex)^n\right)^{-2/n}\text{erfi}\left(\frac{1+bfn\log(F)\log(c(d+e}{\sqrt{b}\sqrt{f}\,n\sqrt{\log(}}\right.}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

Mathematica [A]
time = 0.43, size = 115, normalized size = 1.00

$$\frac{e^{-\frac{1}{bfn^2\log(F)}}F^{af}g\sqrt{\pi}\,(d+ex)^2\left(c(d+ex)^n\right)^{-2/n}\text{erfi}\left(\frac{1+bfn\log(F)\log(c(d+ex)^n)}{\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(d*g + e*g*x),x]
[Out] (F^(a*f)*g*Sqrt[Pi]*(d + e*x)^2*Erfi[(1 + b*f*n*Log[F]*Log[c*(d + e*x)^n])/
(Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(1/(b*f*n^2*Log[F]))*Sqrt
[f]*n*(c*(d + e*x)^n)^(2/n)*Sqrt[Log[F]])
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int F^{f\left(a+b\ln(c(ex+d)^n)^2\right)}(egx+dg)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))*(e*g*x+d*g),x)
```

```
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))*(e*g*x+d*g),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(e*g*x+d*g),x, algorithm="maxima")
```

```
[Out] integrate((e*g*x + d*g)*F^((b*log((e*x + d)^n*c)^2 + a)*f), x)
```

Fricas [A]
time = 0.36, size = 112, normalized size = 0.97

$$-\frac{\sqrt{\pi}\,\sqrt{-bfn^2\log\left(F\right)}\,g\,\mathrm{erf}\left(\frac{\left(bfn^2\log(xe+d)\log(F)+bfn\log(F)\log(c)+1\right)\sqrt{-bfn^2\log\left(F\right)}}{bfn^2\log(F)}\right)e^{\left(\frac{abf^2n^2\log(F)^2-2\,bfn\log(F)\log(c)-1}{bfn^2\log(F)}-1\right)}}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(e*g*x+d*g),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b*f*n^2*log(F))*g*erf((b*f*n^2*log(x*e + d)*log(F) + b*
f*n*log(F)*log(c) + 1)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log(F)))*e^((a*b*f^2*
n^2*log(F)^2 - 2*b*f*n*log(F)*log(c) - 1)/(b*f*n^2*log(F)) - 1)/n
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 372 vs. 2(105) = 210.
time = 27.54, size = 372, normalized size = 3.23

$$\begin{cases} -\frac{F^{af}F^{bf\log\left(c(d+ex)^n\right)^2}bd^2fgn^2\log\left(F\right)}{2e}-\frac{F^{af}F^{bf\log\left(c(d+ex)^n\right)^2}bd^2fgn\log\left(F\right)\log\left(c(d+ex)^n\right)}{2e}+\frac{F^{af}F^{bf\log\left(c(d+ex)^n\right)^2}bdfgn^2x\log\left(F\right)}{2}-F^{af}F^{bf\log\left(c(d+ex)^n\right)^2}bdfgnx\log\left(F\right)\log\left(c(d+ex)^n\right)+\frac{F^{af}F^{bf\log\left(c(d+ex)^n\right)^2}befgn^2x^2\log\left(F\right)}{4}-\frac{F^{af}F^{bf\log\left(c(d+ex)^n\right)^2}befgnx^2\log\left(F\right)\log\left(c(d+ex)^n\right)}{2}+\frac{F^{af}F^{bf\log\left(c(d+ex)^n\right)^2}d^2g}{2e}+F^{af}F^{bf\log\left(c(d+ex)^n\right)^2}dgx+\frac{F^{af}F^{bf\log\left(c(d+ex)^n\right)^2}egx^2}{2} & \text{for}\: e\neq 0 \\ F^{f\left(a+b\log\left(cd^n\right)^2\right)}dgx & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))*(e*g*x+d*g),x)
```

```
[Out] Piecewise((-F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*d**2*f*g*n**2*log(F)
/(2*e) - F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*d**2*f*g*n*log(F)*log(c
*(d + e*x)**n)/(2*e) + F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*d*f*g*n**
2*x*log(F)/2 - F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*d*f*g*n*x*log(F)*
log(c*(d + e*x)**n) + F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*e*f*g*n**2
*x**2*log(F)/4 - F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*e*f*g*n*x**2*lo
g(F)*log(c*(d + e*x)**n)/2 + F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*d**2*
g/(2*e) + F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*d*g*x + F**(a*f)*F**(b*f
*log(c*(d + e*x)**n)**2)*e*g*x**2/2, Ne(e, 0)), (F**(f*(a + b*log(c*d**n)**
2))*d*g*x, True))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(e*g*x+d*g),x, algorithm="giac")
```

```
[Out] integrate((g*x*e + d*g)*F^((b*log((x*e + d)^n*c)^2 + a)*f), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int e^{f\,\ln(F)\,\left(b\ln\left(c\,(d+e\,x)^n\right)^2+a\right)}\,(d\,g+e\,g\,x)\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))*(d*g + e*g*x),x)
```

```
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n)^2))*(d*g + e*g*x), x)
```

3.590 $\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}\,dx$

Optimal. Leaf size=118

$$\frac{e^{-\frac{1}{4bfn^2\log(F)}}F^{af}\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}\operatorname{erfi}\left(\frac{1+2bfn\log(F)\log(c(d+ex)^n)}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

```
[Out] 1/2*F^(a*f)*(e*x+d)*erfi(1/2*(1+2*b*f*n*ln(F)*ln(c*(e*x+d)^n))/n/b^(1/2)/f^
(1/2)/ln(F)^(1/2))*Pi^(1/2)/e/exp(1/4/b/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(1/n)
)/b^(1/2)/f^(1/2)/ln(F)^(1/2)
```

Rubi [A]
time = 0.06, antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.150$, Rules used = {2307, 2266, 2235}

$$\frac{\sqrt{\pi}\,F^{af}(d+ex)e^{-\frac{1}{4bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-1/n}\operatorname{Erfi}\left(\frac{2bfn\log(F)\log(c(d+ex)^n)+1}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2)),x]
```

```
[Out] (F^(a*f)*Sqrt[Pi]*(d + e*x)*Erfi[(1 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^n])/(2
*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(1/(4*b*f*n^2*Log[F]))*Sq
rt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2307

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.)), x
_Symbol] :> Dist[(d + e*x)/(e*n*(c*(d + e*x)^n)^(1/n)), Subst[Int[E^(a*f*Lo
g[F] + x/n + b*f*Log[F]*x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a
, b, c, d, e, f, n}, x]
```

Rubi steps

$$\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}\,dx=\frac{\text{Subst}\left(\int F^{f\left(a+b\log^2(cx^n)\right)}\,dx,x,d+ex\right)}{e}$$

$$=\frac{\left((d+ex)\left(c(d+ex)^n\right)^{-1/n}\right)\text{Subst}\left(\int e^{\frac{x}{n}+af\log(F)+bfx^2\log(F)}\,dx,x,\log\left(c(d+ex)^n\right.\right.}{en}$$

$$=\frac{\left(e^{-\frac{1}{4bfn^2\log(F)}}F^{af}(d+ex)\left(c(d+ex)^n\right)^{-1/n}\right)\text{Subst}\left(\int e^{\frac{\left(\frac{1}{n}+2bfx\log(F)\right)^2}{4bf\log(F)}}\,dx,x,\log\left(c(\right.\right.}{en}$$

$$=\frac{e^{-\frac{1}{4bfn^2\log(F)}}F^{af}\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}\text{erfi}\left(\frac{1+2bfn\log(F)\log\left(c(d+ex)^n\right)}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

Mathematica [A]
time = 0.07, size = 118, normalized size = 1.00

$$\frac{e^{-\frac{1}{4bfn^2\log(F)}}F^{af}\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}\text{erfi}\left(\frac{1+2bfn\log(F)\log\left(c(d+ex)^n\right)}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2)),x]
```

```
[Out] (F^(a*f)*Sqrt[Pi]*(d + e*x)*Erfi[(1 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^n])/(2
*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(1/(4*b*f*n^2*Log[F]))*Sq
rt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]])
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int F^{f\left(a+b\ln\left(c(ex+d)^n\right)^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2)),x)
```

```
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2)),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2)),x, algorithm="maxima")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c)^2 + a)*f), x)
```

Fricas [A]
time = 0.38, size = 116, normalized size = 0.98

$$-\frac{\sqrt{\pi}\,\sqrt{-bfn^2\log(F)}\,\operatorname{erf}\left(\frac{(2\,bfn^2\log(xe+d)\log(F)+2\,bfn\log(F)\log(c)+1)\sqrt{-bfn^2\log(F)}}{2\,bfn^2\log(F)}\right)e^{\left(\frac{4\,abf^2n^2\log(F)^2-4\,bfn\log(F)\log(c)-1}{4\,bfn^2\log(F)}-1\right)}}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2)),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b*f*n^2*log(F))*erf(1/2*(2*b*f*n^2*log(x*e + d)*log(F)
+ 2*b*f*n*log(F)*log(c) + 1)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log(F)))*e^(1/4
*(4*a*b*f^2*n^2*log(F)^2 - 4*b*f*n*log(F)*log(c) - 1)/(b*f*n^2*log(F)) - 1)
/n
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 228 vs. $2(105) = 210$.
time = 7.98, size = 228, normalized size = 1.93

$$\begin{cases} -\frac{2F^{af}F^{bf\log(c(d+ex)^n)^2}bdfn^2\log(F)}{e} - \frac{2F^{af}F^{bf\log(c(d+ex)^n)^2}bdfn\log(F)\log(c(d+ex)^n)}{e} + 2F^{af}F^{bf\log(c(d+ex)^n)^2}bfn^2x\log(F) - 2F^{af}F^{bf\log(c(d+ex)^n)^2}bfnx\log(F)\log(c(d+ex)^n) + \frac{F^{af}F^{bf\log(c(d+ex)^n)^2}d}{e} + F^{af}F^{bf\log(c(d+ex)^n)^2}x & \text{for}\ e\neq 0 \\ F^{f\left(a+b\log(cd^n)^2\right)}x & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2)),x)
```

```
[Out] Piecewise((-2*F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*d*f*n**2*log(F)/e
- 2*F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*d*f*n*log(F)*log(c*(d + e*x)
**n)/e + 2*F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*f*n**2*x*log(F) - 2*F
**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*f*n*x*log(F)*log(c*(d + e*x)**n)
+ F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*d/e + F**(a*f)*F**(b*f*log(c*(d
+ e*x)**n)**2)*x, Ne(e, 0)), (F**(f*(a + b*log(c*d**n)**2))*x, True))
```

Giac [A]
time = 5.12, size = 101, normalized size = 0.86

$$-\frac{\sqrt{\pi}\,F^{af}\operatorname{erf}\left(-\sqrt{-bf\log(F)}\,n\log(xe+d)-\sqrt{-bf\log(F)}\,\log(c)-\frac{\sqrt{-bf\log(F)}}{2\,bfn\log(F)}\right)e^{\left(-\frac{1}{4\,bfn^2\log(F)}-1\right)}}{2\,\sqrt{-bf\log(F)}\,c^{\left(\frac{1}{n}\right)}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2)),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*F^(a*f)*erf(-sqrt(-b*f*log(F))*n*log(x*e + d) - sqrt(-b*f*log
(F))*log(c) - 1/2*sqrt(-b*f*log(F))/(b*f*n*log(F)))*e^(-1/4/(b*f*n^2*log(F)
) - 1)/(sqrt(-b*f*log(F))*c^(1/n)*n)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int F^{b\,f\ln\left(c\,{\left(d+e\,x\right)}^n\right)^2}\,F^{a\,f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2)),x)
```

```
[Out] int(F^(b*f*log(c*(d + e*x)^n)^2)*F^(a*f), x)
```

3.591 $\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{dg+egx}\,dx$

Optimal. Leaf size=67

$$\frac{F^{af}\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,\sqrt{f}\,\sqrt{\log(F)}\,\log\left(c(d+ex)^n\right)\right)}{2\sqrt{b}\,e\sqrt{f}\,gn\sqrt{\log(F)}}$$

```
[Out] 1/2*F^(a*f)*erfi(ln(c*(e*x+d)^n)*b^(1/2)*f^(1/2)*ln(F)^(1/2))*Pi^(1/2)/e/g/
n/b^(1/2)/f^(1/2)/ln(F)^(1/2)
```

Rubi [A]
time = 0.05, antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.065$, Rules used = {2308, 2235}

$$\frac{\sqrt{\pi}\,F^{af}\mathrm{Erfi}\left(\sqrt{b}\,\sqrt{f}\,\sqrt{\log(F)}\,\log\left(c(d+ex)^n\right)\right)}{2\sqrt{b}\,e\sqrt{f}\,gn\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(d*g + e*g*x),x]
```

```
[Out] (F^(a*f)*Sqrt[Pi]*Erfi[Sqrt[b]*Sqrt[f]*Sqrt[Log[F]]*Log[c*(d + e*x)^n]])/(2
*Sqrt[b]*e*Sqrt[f]*g*n*Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2308

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^(m + 1)/(h*n*(c*(d +
e*x)^n)^((m + 1)/n)), Subst[Int[E^(a*f*Log[F] + ((m + 1)*x)/n + b*f*Log[F]*
x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m
, n}, x] && EqQ[e*g - d*h, 0]
```

Rubi steps

$$\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{dg+egx}\,dx = \frac{\text{Subst}\left(\int \frac{F^{f\left(a+b\log^2\left(cx^n\right)\right)}}{gx}\,dx, x, d+ex\right)}{e}$$
$$= \frac{\text{Subst}\left(\int \frac{F^{f\left(a+b\log^2\left(cx^n\right)\right)}}{x}\,dx, x, d+ex\right)}{eg}$$
$$= \frac{\text{Subst}\left(\int e^{af\log(F)+bfx^2\log(F)}\,dx, x, \log\left(c(d+ex)^n\right)\right)}{egn}$$
$$= \frac{F^{af}\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,\sqrt{f}\,\sqrt{\log(F)}\,\log\left(c(d+ex)^n\right)\right)}{2\sqrt{b}\,e\sqrt{f}\,gn\sqrt{\log(F)}}$$

Mathematica [A]
time = 0.05, size = 67, normalized size = 1.00

$$\frac{F^{af}\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,\sqrt{f}\,\sqrt{\log(F)}\,\log\left(c(d+ex)^n\right)\right)}{2\sqrt{b}\,e\sqrt{f}\,gn\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(d*g + e*g*x),x]
[Out] (F^(a*f)*Sqrt[Pi]*Erfi[Sqrt[b]*Sqrt[f]*Sqrt[Log[F]]*Log[c*(d + e*x)^n]])/(2
*Sqrt[b]*e*Sqrt[f]*g*n*Sqrt[Log[F]])
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.34, size = 382, normalized size = 5.70

$$\frac{\sqrt{\pi}\,F^{f\left(-ib\ln(c)\pi\,\text{csgn}(ic)\text{csgn}(ic(ex+d)^n)\text{csgn}(i(ex+d)^n)+b\,\pi^2\text{csgn}(ic)\text{csgn}(ic(ex+d)^n)-b\,\pi^2\text{csgn}(ic)\text{csgn}(i(ex+d)^n)+b\,\pi^2\text{csgn}(ic(ex+d)^n)\text{csg}}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))/(e*g*x+d*g),x)
[Out] 1/2/g/e/n*Pi^(1/2)*F^(f*(-I*b*ln(c)*Pi*csgn(I*c)*csgn(I*c*(e*x+d)^n)*csgn(I
*(e*x+d)^n)+b*Pi^2*csgn(I*c)*csgn(I*c*(e*x+d)^n)-b*Pi^2*csgn(I*c)*csgn(I*(e
*x+d)^n)+b*Pi^2*csgn(I*c*(e*x+d)^n)*csgn(I*(e*x+d)^n)+I*b*ln(c)*Pi*csgn(I*c
)-I*b*ln(c)*Pi*csgn(I*c*(e*x+d)^n)+I*b*ln(c)*Pi*csgn(I*(e*x+d)^n)-b*Pi^2+b*
ln(c)^2+a))*F^(-1/4*f*b*(I*Pi*csgn(I*c)*csgn(I*c*(e*x+d)^n)*csgn(I*(e*x+d)^
n)-I*Pi*csgn(I*c)+I*Pi*csgn(I*c*(e*x+d)^n)-I*Pi*csgn(I*(e*x+d)^n)-2*ln(c))^
```

```
2)/(-ln(F)*b*f)^(1/2)*erf((-ln(F)*b*f)^(1/2)*ln((e*x+d)^n)-1/2*f*b*(2*ln(c)
-I*Pi*csgn(I*c*(e*x+d)^n)*(-csgn(I*c*(e*x+d)^n)+csgn(I*c))*(-csgn(I*c*(e*x+
d)^n)+csgn(I*(e*x+d)^n)))*ln(F)/(-ln(F)*b*f)^(1/2))
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(e*g*x+d*g),x, algorithm="maxima")
[Out] integrate(F^((b*log((e*x + d)^n*c)^2 + a)*f)/(e*g*x + d*g), x)
```

Fricas [A]
time = 0.36, size = 57, normalized size = 0.85

$$-\frac{\sqrt{\pi}\sqrt{-bfn^2\log(F)}\,F^{af}\,\mathrm{erf}\left(\frac{\sqrt{-bfn^2\log(F)}\,(n\log(xe+d)+\log(c))}{n}\right)e^{(-1)}}{2\,gn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(e*g*x+d*g),x, algorithm="fricas")
[Out] -1/2*sqrt(pi)*sqrt(-b*f*n^2*log(F))*F^(a*f)*erf(sqrt(-b*f*n^2*log(F))*(n*lo
g(x*e + d) + log(c))/n)*e^(-1)/(g*n)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int\frac{F^{af}F^{bf\log\left(c(d+ex)^n\right)^2}}{d+ex}\,dx}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))/(e*g*x+d*g),x)
[Out] Integral(F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)/(d + e*x), x)/g
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(e*g*x+d*g),x, algorithm="giac")
```

```
[Out] integrate(F^((b*log((x*e + d)^n*c)^2 + a)*f)/(g*x*e + d*g), x)
```

Mupad [B]
time = 3.74, size = 49, normalized size = 0.73

$$\frac{F^{a f} \sqrt{\pi} \operatorname{erfi}\left(\frac{b f \ln(F) \ln(c (d+e x)^n)}{\sqrt{b f \ln(F)}}\right)}{2 e g n \sqrt{b f \ln(F)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))/(d*g + e*g*x),x)
```

```
[Out] (F^(a*f)*pi^(1/2)*erfi((b*f*log(F)*log(c*(d + e*x)^n))/(b*f*log(F))^(1/2)))
/(2*e*g*n*(b*f*log(F))^(1/2))
```

3.592 $\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(dg+egx)^2}\,dx$

Optimal. Leaf size=121

$$-\frac{e^{-\frac{1}{4bfn^2\log(F)}}F^{af}\sqrt{\pi}\,\left(c(d+ex)^n\right)^{\frac{1}{n}}\operatorname{erfi}\left(\frac{1-2bfn\log(F)\log\left(c(d+ex)^n\right)}{2\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,g^2n(d+ex)\sqrt{\log(F)}}$$

```
[Out] 1/2*F^(a*f)*(c*(e*x+d)^n)^(1/n)*erfi(1/2*(-1+2*b*f*n*ln(F)*ln(c*(e*x+d)^n))
/n/b^(1/2)/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/e/exp(1/4/b/f/n^2/ln(F))/g^2/n/(e*
x+d)/b^(1/2)/f^(1/2)/ln(F)^(1/2)
```

Rubi [A]
time = 0.07, antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {2308, 2266, 2235}

$$-\frac{\sqrt{\pi}\,F^{af}e^{-\frac{1}{4bfn^2\log(F)}}\left(c(d+ex)^n\right)^{\frac{1}{n}}\operatorname{Erfi}\left(\frac{1-2bfn\log(F)\log\left(c(d+ex)^n\right)}{2\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,g^2n\sqrt{\log(F)}\,(d+ex)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(d*g + e*g*x)^2,x]
```

```
[Out] -1/2*(F^(a*f)*Sqrt[Pi]*(c*(d + e*x)^n)^n^(-1)*Erfi[(1 - 2*b*f*n*Log[F]*Log[
c*(d + e*x)^n])/(2*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(Sqrt[b]*e*E^(1/(4*b*f
*n^2*Log[F]))*Sqrt[f]*g^2*n*(d + e*x)*Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2308

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^(m + 1)/(h*n*(c*(d +
e*x)^n)^((m + 1)/n)), Subst[Int[E^(a*f*Log[F] + ((m + 1)*x)/n + b*f*Log[F]*
x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m
```

```
, n}, x] && EqQ[e*g - d*h, 0]
```

Rubi steps

$$\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(dg+egx)^2}\,dx = \frac{\text{Subst}\left(\int \frac{F^{f\left(a+b\log^2\left(cx^n\right)\right)}}{g^2x^2}\,dx,x,d+ex\right)}{e}$$

$$= \frac{\text{Subst}\left(\int \frac{F^{f\left(a+b\log^2\left(cx^n\right)\right)}}{x^2}\,dx,x,d+ex\right)}{eg^2}$$

$$= \frac{\left(c(d+ex)^n\right)^{\frac{1}{n}}\text{Subst}\left(\int e^{-\frac{x}{n}+af\log(F)+bfx^2\log(F)}\,dx,x,\log\left(c(d+ex)^n\right)\right)}{eg^2n(d+ex)}$$

$$= \frac{\left(e^{-\frac{1}{4bfn^2\log(F)}}F^{af}\left(c(d+ex)^n\right)^{\frac{1}{n}}\right)\text{Subst}\left(\int e^{\frac{\left(-\frac{1}{n}+2bfx\log(F)\right)^2}{4bf\log(F)}}\,dx,x,\log\left(c(d+ex)^n\right)\right)}{eg^2n(d+ex)}$$

$$= -\frac{e^{-\frac{1}{4bfn^2\log(F)}}F^{af}\sqrt{\pi}\left(c(d+ex)^n\right)^{\frac{1}{n}}\text{erfi}\left(\frac{1-2bfn\log(F)\log\left(c(d+ex)^n\right)}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,g^2n(d+ex)\sqrt{\log(F)}}$$

Mathematica [A]
time = 0.17, size = 121, normalized size = 1.00

$$\frac{e^{-\frac{1}{4bfn^2\log(F)}}F^{af}\sqrt{\pi}\left(c(d+ex)^n\right)^{\frac{1}{n}}\text{erfi}\left(\frac{-1+2bfn\log(F)\log\left(c(d+ex)^n\right)}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,g^2n(d+ex)\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(d*g + e*g*x)^2,x]
[Out] (F^(a*f)*Sqrt[Pi]*(c*(d + e*x)^n)^n^(-1)*Erfi[(-1 + 2*b*f*n*Log[F]*Log[c*(d
 + e*x)^n])/(2*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(1/(4*b*f*n
^2*Log[F]))*Sqrt[f]*g^2*n*(d + e*x)*Sqrt[Log[F]])
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{F^{f\left(a+b\ln\left(c(ex+d)^n\right)^2\right)}}{(egx+dg)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))/(e*g*x+d*g)^2,x)
```

```
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))/(e*g*x+d*g)^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(e*g*x+d*g)^2,x, algorithm="maxima
")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c)^2 + a)*f)/(e*g*x + d*g)^2, x)
```

Fricas [A]
time = 0.37, size = 119, normalized size = 0.98

$$-\frac{\sqrt{\pi}\,\sqrt{-bfn^2\log(F)}\,\operatorname{erf}\left(\frac{(2\,bfn^2\log(xe+d)\log(F)+2\,bfn\log(F)\log(c)-1)\,\sqrt{-bfn^2\log(F)}}{2\,bfn^2\log(F)}\right)e^{\left(\frac{4\,abf^2n^2\log(F)^2+4\,bfn\log(F)\log(c)-1}{4\,bfn^2\log(F)}-1\right)}}{2\,g^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(e*g*x+d*g)^2,x, algorithm="fricas
")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b*f*n^2*log(F))*erf(1/2*(2*b*f*n^2*log(x*e + d)*log(F)
+ 2*b*f*n*log(F)*log(c) - 1)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log(F)))*e^(1/4
*(4*a*b*f^2*n^2*log(F)^2 + 4*b*f*n*log(F)*log(c) - 1)/(b*f*n^2*log(F)) - 1)
/(g^2*n)
```

Sympy [A]
time = 96.14, size = 211, normalized size = 1.74

$$\begin{cases} \frac{\tilde{\infty} F^{f\left(a+b\log{(0^n c)}^2\right)}}{g^2x} & \text{for}\: d = 0 \wedge e = 0 \\ \tilde{\infty} F^{f\left(a+b\log{(0^n c)}^2\right)} x & \text{for}\: d = -ex \\ \frac{F^{f\left(a+b\log{(cd^n)}^2\right)} x}{d^2g^2} & \text{for}\: e = 0 \\ -\frac{2F^{af}F^{bf\log{(c(d+ex)^n)}^2}bfn^2\log{(F)}}{deg^2+e^2g^2x} - \frac{2F^{af}F^{bf\log{(c(d+ex)^n)}^2}bfn\log{(F)}\log{(c(d+ex)^n)}}{deg^2+e^2g^2x} - \frac{F^{af}F^{bf\log{(c(d+ex)^n)}^2}}{deg^2+e^2g^2x} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))/(e*g*x+d*g)**2,x)
```

```
[Out] Piecewise((zoo*F**(f*(a + b*log(0**n*c)**2))/(g**2*x), Eq(d, 0) & Eq(e, 0))
, (zoo*F**(f*(a + b*log(0**n*c)**2))*x, Eq(d, -e*x)), (F**(f*(a + b*log(c*d
**n)**2))*x/(d**2*g**2), Eq(e, 0)), (-2*F**(a*f)*F**(b*f*log(c*(d + e*x)**n
```

```
)**2)*b*f*n**2*log(F)/(d*e*g**2 + e**2*g**2*x) - 2*F**(a*f)*F**(b*f*log(c*(
d + e*x)**n)**2)*b*f*n*log(F)*log(c*(d + e*x)**n)/(d*e*g**2 + e**2*g**2*x)
- F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)/(d*e*g**2 + e**2*g**2*x), True))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(e*g*x+d*g)^2,x, algorithm="giac")
[Out] integrate(F^((b*log((x*e + d)^n*c)^2 + a)*f)/(g*x*e + d*g)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{e}^{f\,\ln(F)\,\left(b\ln\left(c\,{(d+e\,x)}^n\right)^2+a\right)}}{{(d\,g+e\,g\,x)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))/(d*g + e*g*x)^2,x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n)^2))/(d*g + e*g*x)^2, x)
```

3.593 $\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(dg+egx)^3}\,dx$

Optimal. Leaf size=118

$$-\frac{e^{-\frac{1}{bfn^2\log(F)}}F^{af}\sqrt{\pi}\,\left(c(d+ex)^n\right)^{2/n}\operatorname{erfi}\left(\frac{1-bfn\log(F)\log\left(c(d+ex)^n\right)}{\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,g^3n(d+ex)^2\sqrt{\log(F)}}$$

```
[Out] 1/2*F^(a*f)*(c*(e*x+d)^n)^(2/n)*erfi((-1+b*f*n*ln(F)*ln(c*(e*x+d)^n))/n/b^(
1/2)/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/e/exp(1/b/f/n^2/ln(F))/g^3/n/(e*x+d)^2/b
^(1/2)/f^(1/2)/ln(F)^(1/2)
```

Rubi [A]
time = 0.06, antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {2308, 2266, 2235}

$$-\frac{\sqrt{\pi}\,F^{af}e^{-\frac{1}{bfn^2\log(F)}}\left(c(d+ex)^n\right)^{2/n}\operatorname{Erfi}\left(\frac{1-bfn\log(F)\log\left(c(d+ex)^n\right)}{\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,g^3n\sqrt{\log(F)}\,(d+ex)^2}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(d*g + e*g*x)^3,x]
```

```
[Out] -1/2*(F^(a*f)*Sqrt[Pi]*(c*(d + e*x)^n)^(2/n)*Erfi[(1 - b*f*n*Log[F]*Log[c*(
d + e*x)^n])/(Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(Sqrt[b]*e*E^(1/(b*f*n^2*Lo
g[F]))*Sqrt[f]*g^3*n*(d + e*x)^2*Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2308

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^(m + 1)/(h*n*(c*(d +
e*x)^n)^((m + 1)/n)), Subst[Int[E^(a*f*Log[F] + ((m + 1)*x)/n + b*f*Log[F]*
x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m
```

```
, n}, x] && EqQ[e*g - d*h, 0]
```

Rubi steps

$$\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(dg+egx)^3}\,dx = \frac{\text{Subst}\left(\int \frac{F^{f\left(a+b\log^2(cx^n)\right)}}{g^3x^3}\,dx,x,d+ex\right)}{e}$$
$$= \frac{\text{Subst}\left(\int \frac{F^{f\left(a+b\log^2(cx^n)\right)}}{x^3}\,dx,x,d+ex\right)}{eg^3}$$
$$= \frac{\left(c(d+ex)^n\right)^{2/n}\text{Subst}\left(\int e^{-\frac{2x}{n}+af\log(F)+bfx^2\log(F)}\,dx,x,\log\left(c(d+ex)^n\right)\right)}{eg^3n(d+ex)^2}$$
$$= \frac{\left(e^{-\frac{1}{bfn^2\log(F)}}F^{af}\left(c(d+ex)^n\right)^{2/n}\right)\text{Subst}\left(\int e^{\frac{\left(-\frac{2}{n}+2bfx\log(F)\right)^2}{4bf\log(F)}}\,dx,x,\log\left(c(d+ex)^n\right)\right)}{eg^3n(d+ex)^2}$$
$$= -\frac{e^{-\frac{1}{bfn^2\log(F)}}F^{af}\sqrt{\pi}\left(c(d+ex)^n\right)^{2/n}\text{erfi}\left(\frac{1-bfn\log(F)\log(c(d+ex)^n)}{\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,g^3n(d+ex)^2\sqrt{\log(F)}}$$

Mathematica [A]
time = 0.17, size = 117, normalized size = 0.99

$$\frac{e^{-\frac{1}{bfn^2\log(F)}}F^{af}\sqrt{\pi}\left(c(d+ex)^n\right)^{2/n}\text{erfi}\left(\frac{-1+bfn\log(F)\log(c(d+ex)^n)}{\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,g^3n(d+ex)^2\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(d*g + e*g*x)^3,x]
[Out] (F^(a*f)*Sqrt[Pi]*(c*(d + e*x)^n)^(2/n)*Erfi[(-1 + b*f*n*Log[F]*Log[c*(d +
e*x)^n])/(Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(1/(b*f*n^2*Log[
F]))*Sqrt[f]*g^3*n*(d + e*x)^2*Sqrt[Log[F]])
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{F^{f\left(a+b\ln\left(c(ex+d)^n\right)^2\right)}}{(egx+dg)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))/(e*g*x+d*g)^3,x)
```

```
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))/(e*g*x+d*g)^3,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(e*g*x+d*g)^3,x, algorithm="maxima
")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c)^2 + a)*f)/(e*g*x + d*g)^3, x)
```

Fricas [A]
time = 0.37, size = 114, normalized size = 0.97

$$-\frac{\sqrt{\pi}\sqrt{-bfn^2\log\left(F\right)}\operatorname{erf}\left(\frac{\left(bfn^2\log(xe+d)\log(F)+bfn\log(F)\log(c)-1\right)\sqrt{-bfn^2\log\left(F\right)}}{bfn^2\log(F)}\right)e^{\left(\frac{abf^2n^2\log(F)^2+2\,bfn\log(F)\log(c)-1}{bfn^2\log(F)}-1\right)}}{2\,g^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(e*g*x+d*g)^3,x, algorithm="fricas
")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b*f*n^2*log(F))*erf((b*f*n^2*log(x*e + d)*log(F) + b*f*
n*log(F)*log(c) - 1)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log(F)))*e^((a*b*f^2*n^
2*log(F)^2 + 2*b*f*n*log(F)*log(c) - 1)/(b*f*n^2*log(F)) - 1)/(g^3*n)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))/(e*g*x+d*g)**3,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(e*g*x+d*g)^3,x, algorithm="giac")
```

```
[Out] integrate(F^((b*log((x*e + d)^n*c)^2 + a)*f)/(g*x*e + d*g)^3, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{e^{f\ln(F)\left(b\ln(c\,(d+e\,x)^n)^2+a\right)}}{(d\,g+e\,g\,x)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))/(d*g + e*g*x)^3,x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n)^2))/(d*g + e*g*x)^3, x)
```

3.594 $\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}(g+hx)^m\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}(g+hx)^m,x\right)$$

```
[Out] Unintegrable(F^(f*(a+b*ln(c*(e*x+d)^n)^2))*(h*x+g)^m,x)
```

Rubi [A]
time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}(g+hx)^m\,dx$$

Verification is not applicable to the result.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(g + h*x)^m,x]
```

```
[Out] Defer[Int][F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(g + h*x)^m, x]
```

Rubi steps

$$\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}(g+hx)^m\,dx=\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}(g+hx)^m\,dx$$

Mathematica [A]
time = 2.04, size = 0, normalized size = 0.00

$$\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}(g+hx)^m\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(g + h*x)^m,x]
```

```
[Out] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(g + h*x)^m, x]
```

Maple [A]
time = 0.02, size = 0, normalized size = 0.00

$$\int F^{f\left(a+b\ln\left(c(ex+d)^n\right)^2\right)}(hx+g)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))*(h*x+g)^m,x)
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))*(h*x+g)^m,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(h*x+g)^m,x, algorithm="maxima")
[Out] integrate((h*x + g)^m*F^((b*log((e*x + d)^n*c)^2 + a)*f), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(h*x+g)^m,x, algorithm="fricas")
[Out] integral((h*x + g)^m*F^(b*f*log((x*e + d)^n*c)^2 + a*f), x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))*(h*x+g)**m,x)
[Out] Exception raised: HeuristicGCDFailed >> no luck
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(h*x+g)^m,x, algorithm="giac")
[Out] integrate((h*x + g)^m*F^((b*log((x*e + d)^n*c)^2 + a)*f), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \mathrm{e}^{f\,\ln(F)\,\left(b\ln\left(c\,(d+e\,x)^n\right)^2+a\right)}\,(g+h\,x)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))*(g + h*x)^m,x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n)^2))*(g + h*x)^m, x)
```

3.595 $\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}(g+hx)^3\,dx$

Optimal. Leaf size=502

$$\frac{3e^{-\frac{1}{bfn^2\log(F)}}F^{af}h(eg-dh)^2\sqrt{\pi}\,(d+ex)^2\left(c(d+ex)^n\right)^{-2/n}\operatorname{erfi}\left(\frac{1+bfn\log(F)\log(c(d+ex)^n)}{\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e^4\sqrt{f}\,n\sqrt{\log(F)}}+\frac{e^{-\frac{4}{bfn^2\log(F)}}F^{af}h^3\sqrt{}}{}$$

```
[Out] 3/2*F^(a*f)*h*(-d*h+e*g)^2*(e*x+d)^2*erfi((1+b*f*n*ln(F)*ln(c*(e*x+d)^n))/n
/b^(1/2)/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/e^4/exp(1/b/f/n^2/ln(F))/n/((c*(e*x+
d)^n)^(2/n))/b^(1/2)/f^(1/2)/ln(F)^(1/2)+1/2*F^(a*f)*h^3*(e*x+d)^4*erfi((2+
b*f*n*ln(F)*ln(c*(e*x+d)^n))/n/b^(1/2)/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/e^4/ex
p(4/b/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(4/n))/b^(1/2)/f^(1/2)/ln(F)^(1/2)+1/2*
F^(a*f)*(-d*h+e*g)^3*(e*x+d)*erfi(1/2*(1+2*b*f*n*ln(F)*ln(c*(e*x+d)^n))/n/b
^(1/2)/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/e^4/exp(1/4/b/f/n^2/ln(F))/n/((c*(e*x+
d)^n)^(1/n))/b^(1/2)/f^(1/2)/ln(F)^(1/2)+3/2*F^(a*f)*h^2*(-d*h+e*g)*(e*x+d)
^3*erfi(1/2*(3+2*b*f*n*ln(F)*ln(c*(e*x+d)^n))/n/b^(1/2)/f^(1/2)/ln(F)^(1/2)
)*Pi^(1/2)/e^4/exp(9/4/b/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(3/n))/b^(1/2)/f^(1/
2)/ln(F)^(1/2)
```

Rubi [A]

time = 0.70, antiderivative size = 502, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.179$, Rules used = {2309, 2307, 2266, 2235, 2308}

$$\frac{3\sqrt{\pi}\,h^2F^{af}(d+ex)^3(eg-dh)e^{-\frac{9}{4bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-3/n}\operatorname{Erfi}\left(\frac{2bfn\log(F)\log(c(d+ex)^n)+3}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e^4\sqrt{f}\,n\sqrt{\log(F)}}+\frac{3\sqrt{\pi}\,hF^{af}(d+ex)^2(eg-dh)^2e^{-\frac{1}{bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-2/n}\operatorname{Erfi}\left(\frac{bfn\log(F)\log(c(d+ex)^n)+1}{\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e^4\sqrt{f}\,n\sqrt{\log(F)}}+\frac{\sqrt{\pi}\,F^{af}(d+ex)(eg-dh)^3e^{-\frac{1}{4bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-1/n}\operatorname{Erfi}\left(\frac{2bfn\log(F)\log(c(d+ex)^n)+1}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e^4\sqrt{f}\,n\sqrt{\log(F)}}+\frac{\sqrt{\pi}\,h^3F^{af}(d+ex)^4e^{-\frac{4}{bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-4/n}\operatorname{Erfi}\left(\frac{bfn\log(F)\log(c(d+ex)^n)+2}{\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e^4\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(g + h*x)^3,x]
```

```
[Out] (3*F^(a*f)*h*(e*g - d*h)^2*Sqrt[Pi]*(d + e*x)^2*Erfi[(1 + b*f*n*Log[F]*Log[
c*(d + e*x)^n])/(Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e^4*E^(1/(b*f
*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(2/n)*Sqrt[Log[F]]) + (F^(a*f)*h^3*
Sqrt[Pi]*(d + e*x)^4*Erfi[(2 + b*f*n*Log[F]*Log[c*(d + e*x)^n])/(Sqrt[b]*Sq
rt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e^4*E^(4/(b*f*n^2*Log[F]))*Sqrt[f]*n*(c*
(d + e*x)^n)^(4/n)*Sqrt[Log[F]]) + (F^(a*f)*(e*g - d*h)^3*Sqrt[Pi]*(d + e*x
)*Erfi[(1 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^n])/(2*Sqrt[b]*Sqrt[f]*n*Sqrt[Lo
g[F]])])/(2*Sqrt[b]*e^4*E^(1/(4*b*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^
n^(-1)*Sqrt[Log[F]]) + (3*F^(a*f)*h^2*(e*g - d*h)*Sqrt[Pi]*(d + e*x)^3*Erfi
[(3 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^n])/(2*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])
])/(2*Sqrt[b]*e^4*E^(9/(4*b*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(3/n)*
Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
```

```
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2307

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.)), x
_Symbol] :> Dist[(d + e*x)/(e*n*(c*(d + e*x)^n)^(1/n)), Subst[Int[E^(a*f*Lo
g[F] + x/n + b*f*Log[F]*x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a
, b, c, d, e, f, n}, x]
```

Rule 2308

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^(m + 1)/(h*n*(c*(d +
e*x)^n)^((m + 1)/n)), Subst[Int[E^(a*f*Log[F] + ((m + 1)*x)/n + b*f*Log[F]*
x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m
, n}, x] && EqQ[e*g - d*h, 0]
```

Rule 2309

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[1/e^(m + 1), Subst[Int[ExpandIn
tegrand[F^(f*(a + b*Log[c*x^n]^2)), (e*g - d*h + h*x)^m, x], x], x, d + e*x
], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, n}, x] && IGtQ[m, 0]
```

Rubi steps

$$
\begin{aligned}
\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}(g+hx)^3\,dx &= \int \left(F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}g^3+3F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}g^2hx+3F^{f\left(a+b\log^2\left(c(\right.\right.}\right.\\
&= g^3\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}\,dx+\left(3g^2h\right)\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}x\,dx+\left(3g\right.\\
&= \frac{g^3\text{Subst}\left(\int F^{f\left(a+b\log^2\left(cx^n\right)\right)}\,dx,x,d+ex\right)}{e}+\left(3g^2h\right)\int F^{f\left(a+b\log^2\left(c(d+ex\right.\right.}\\
&= \left(3g^2h\right)\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}x\,dx+\left(3gh^2\right)\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}x^2\,d\\
&= \left(3g^2h\right)\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}x\,dx+\left(3gh^2\right)\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}x^2\,d\\
&= \frac{e^{-\frac{1}{4bfn^2\log(F)}}F^{af}g^3\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}\text{erfi}\left(\frac{1+2bfn\log(F)\log(c(d}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log}}\right.}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}
\end{aligned}
$$

Mathematica [A]
time = 1.44, size = 396, normalized size = 0.79

$$
\frac{e^{-\frac{4}{bfn^2\log(F)}}F^{af}\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-4/n}\left(3e^{\frac{3}{bfn^2\log(F)}}h(eg-dh)^2(d+ex)\left(c(d+ex)^n\right)^{2/n}\text{erfi}\left(\frac{1+bfn\log(F)\log(c(d+ex)^n)}{\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)+h^3(d+ex)^3\text{erfi}\left(\frac{2+bfn\log(F)\log(c(d+ex)^n)}{\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)+e^{\frac{7}{4bfn^2\log(F)}}(eg-dh)\left(c(d+ex)^n\right)^{\frac{1}{n}}\left(e^{\frac{2}{bfn^2\log(F)}}(eg-dh)^2\left(c(d+ex)^n\right)^{2/n}\text{erfi}\left(\frac{1+2bfn\log(F)\log(c(d+ex)^n)}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)+3h^2(d+ex)^2\text{erfi}\left(\frac{3+2bfn\log(F)\log(c(d+ex)^n)}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)\right)\right)}{2\sqrt{b}\,e^4\sqrt{f}\,n\sqrt{\log(F)}}
$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(g + h*x)^3,x]
```

```
[Out] (F^(a*f)*Sqrt[Pi]*(d + e*x)*(3*E^(3/(b*f*n^2*Log[F]))*h*(e*g - d*h)^2*(d +
e*x)*(c*(d + e*x)^n)^(2/n)*Erfi[(1 + b*f*n*Log[F]*Log[c*(d + e*x)^n])/(Sqrt
[b]*Sqrt[f]*n*Sqrt[Log[F]])] + h^3*(d + e*x)^3*Erfi[(2 + b*f*n*Log[F]*Log[c
*(d + e*x)^n])/(Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])] + E^(7/(4*b*f*n^2*Log[F]))
*(e*g - d*h)*(c*(d + e*x)^n)^n^(-1)*(E^(2/(b*f*n^2*Log[F]))*(e*g - d*h)^2*(
c*(d + e*x)^n)^(2/n)*Erfi[(1 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^n])/(2*Sqrt[b
]*Sqrt[f]*n*Sqrt[Log[F]])] + 3*h^2*(d + e*x)^2*Erfi[(3 + 2*b*f*n*Log[F]*Log
[c*(d + e*x)^n])/(2*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])))/(2*Sqrt[b]*e^4*E^(4
/(b*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(4/n)*Sqrt[Log[F]])
```

Maple [F]
time = 0.03, size = 0, normalized size = 0.00

$$
\int F^{f\left(a+b\ln\left(c(ex+d)^n\right)^2\right)}(hx+g)^3\,dx
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))*(h*x+g)^3,x)
```

```
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))*(h*x+g)^3,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(h*x+g)^3,x, algorithm="maxima")
```

```
[Out] integrate((h*x + g)^3*F^((b*log((e*x + d)^n*c)^2 + a)*f), x)
```

Fricas [A]
time = 0.38, size = 517, normalized size = 1.03

$$-\frac{\sqrt{\pi}\sqrt{-bfn^2\log(F)}h^3\operatorname{erf}\left(\frac{(bfn^2\log(xe+d)\log(F)+bfn\log(F)\log(c)+2)\sqrt{-bfn^2\log(F)}}{bfn^2\log(F)}\right)e^{\left(\frac{abf^2n^2\log(F)^2-4bfn\log(F)\log(c)-4}{bfn^2\log(F)}\right)}-\sqrt{\pi}(d^3h^3-3d^2gh^2e+3dg^2he^2-g^3e^3)\sqrt{-bfn^2\log(F)}\operatorname{erf}\left(\frac{(2bfn^2\log(xe+d)\log(F)+2bfn\log(F)\log(c)+1)\sqrt{-bfn^2\log(F)}}{2bfn^2\log(F)}\right)e^{\left(\frac{4abf^2n^2\log(F)^2-4bfn\log(F)\log(c)-1}{4bfn^2\log(F)}\right)}-3\sqrt{\pi}\sqrt{-bfn^2\log(F)}(dh^3-gh^2e)\operatorname{erf}\left(\frac{(2bfn^2\log(xe+d)\log(F)+2bfn\log(F)\log(c)+3)\sqrt{-bfn^2\log(F)}}{2bfn^2\log(F)}\right)e^{\left(\frac{4abf^2n^2\log(F)^2-12bfn\log(F)\log(c)-9}{4bfn^2\log(F)}\right)}+3\sqrt{\pi}(d^2h^3-2dgh^2e+g^2he^2)\sqrt{-bfn^2\log(F)}\operatorname{erf}\left(\frac{(bfn^2\log(xe+d)\log(F)+bfn\log(F)\log(c)+1)\sqrt{-bfn^2\log(F)}}{bfn^2\log(F)}\right)e^{\left(\frac{abf^2n^2\log(F)^2-2bfn\log(F)\log(c)-1}{bfn^2\log(F)}\right)}e^{(-4)}}{2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(h*x+g)^3,x, algorithm="fricas")
```

```
[Out] -1/2*(sqrt(pi)*sqrt(-b*f*n^2*log(F))*h^3*erf((b*f*n^2*log(x*e + d)*log(F) +
 b*f*n*log(F)*log(c) + 2)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log(F)))*e^((a*b*f
^2*n^2*log(F)^2 - 4*b*f*n*log(F)*log(c) - 4)/(b*f*n^2*log(F))) - sqrt(pi)*(
d^3*h^3 - 3*d^2*g*h^2*e + 3*d*g^2*h*e^2 - g^3*e^3)*sqrt(-b*f*n^2*log(F))*er
f(1/2*(2*b*f*n^2*log(x*e + d)*log(F) + 2*b*f*n*log(F)*log(c) + 1)*sqrt(-b*f
*n^2*log(F))/(b*f*n^2*log(F)))*e^(1/4*(4*a*b*f^2*n^2*log(F)^2 - 4*b*f*n*log
(F)*log(c) - 1)/(b*f*n^2*log(F))) - 3*sqrt(pi)*sqrt(-b*f*n^2*log(F))*(d*h^3
 - g*h^2*e)*erf(1/2*(2*b*f*n^2*log(x*e + d)*log(F) + 2*b*f*n*log(F)*log(c)
+ 3)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log(F)))*e^(1/4*(4*a*b*f^2*n^2*log(F)^2
 - 12*b*f*n*log(F)*log(c) - 9)/(b*f*n^2*log(F))) + 3*sqrt(pi)*(d^2*h^3 - 2*
d*g*h^2*e + g^2*h*e^2)*sqrt(-b*f*n^2*log(F))*erf((b*f*n^2*log(x*e + d)*log(
F) + b*f*n*log(F)*log(c) + 1)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log(F)))*e^((a
*b*f^2*n^2*log(F)^2 - 2*b*f*n*log(F)*log(c) - 1)/(b*f*n^2*log(F))))*e^(-4)/
n
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))*(h*x+g)**3,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(h*x+g)^3,x, algorithm="giac")
[Out] integrate((h*x + g)^3*F^((b*log((x*e + d)^n*c)^2 + a)*f), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{e}^{f\,\ln(F)\,\left(b\ln(c\,(d+e\,x)^n)^2+a\right)}\,(g+h\,x)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))*(g + h*x)^3,x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n)^2))*(g + h*x)^3, x)
```

3.596 $\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}(g+hx)^2\,dx$

Optimal. Leaf size=372

$$\frac{e^{-\frac{1}{bfn^2\log(F)}}F^{af}h(eg-dh)\sqrt{\pi}\,(d+ex)^2\left(c(d+ex)^n\right)^{-2/n}\operatorname{erfi}\left(\frac{1+bfn\log(F)\log(c(d+ex)^n)}{\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{\sqrt{b}\,e^3\sqrt{f}\,n\sqrt{\log(F)}}+\frac{e^{-\frac{1}{4bfn^2\log(F)}}F^{af}(eg-$$

```
[Out] F^(a*f)*h*(-d*h+e*g)*(e*x+d)^2*erfi((1+b*f*n*ln(F)*ln(c*(e*x+d)^n))/n/b^(1/
2)/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/e^3/exp(1/b/f/n^2/ln(F))/n/((c*(e*x+d)^n)^
(2/n))/b^(1/2)/f^(1/2)/ln(F)^(1/2)+1/2*F^(a*f)*(-d*h+e*g)^2*(e*x+d)*erfi(1/
2*(1+2*b*f*n*ln(F)*ln(c*(e*x+d)^n))/n/b^(1/2)/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)
/e^3/exp(1/4/b/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(1/n))/b^(1/2)/f^(1/2)/ln(F)^(
1/2)+1/2*F^(a*f)*h^2*(e*x+d)^3*erfi(1/2*(3+2*b*f*n*ln(F)*ln(c*(e*x+d)^n))/n
/b^(1/2)/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/e^3/exp(9/4/b/f/n^2/ln(F))/n/((c*(e*
x+d)^n)^(3/n))/b^(1/2)/f^(1/2)/ln(F)^(1/2)
```

Rubi [A]
time = 0.47, antiderivative size = 372, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.179$, Rules used = {2309, 2307, 2266, 2235, 2308}

$$\frac{\sqrt{\pi}\,hF^{af}(d+ex)^2(eg-dh)e^{-\frac{1}{bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-2/n}\operatorname{Erfi}\left(\frac{bfn\log(F)\log(c(d+ex)^n)+1}{\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{\sqrt{b}\,e^3\sqrt{f}\,n\sqrt{\log(F)}}+\frac{\sqrt{\pi}\,F^{af}(d+ex)(eg-dh)^2e^{-\frac{1}{4bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-1/n}\operatorname{Erfi}\left(\frac{2bfn\log(F)\log(c(d+ex)^n)+1}{2\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e^3\sqrt{f}\,n\sqrt{\log(F)}}+\frac{\sqrt{\pi}\,h^2F^{af}(d+ex)^3e^{-\frac{9}{4bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-3/n}\operatorname{Erfi}\left(\frac{2bfn\log(F)\log(c(d+ex)^n)+3}{2\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e^3\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(g + h*x)^2,x]
```

```
[Out] (F^(a*f)*h*(e*g - d*h)*Sqrt[Pi]*(d + e*x)^2*Erfi[(1 + b*f*n*Log[F]*Log[c*(d
 + e*x)^n])/(Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(Sqrt[b]*e^3*E^(1/(b*f*n^2*L
og[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(2/n)*Sqrt[Log[F]]) + (F^(a*f)*(e*g - d*h
)^2*Sqrt[Pi]*(d + e*x)*Erfi[(1 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^n])/(2*Sqrt
[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e^3*E^(1/(4*b*f*n^2*Log[F]))*Sqrt[
f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]]) + (F^(a*f)*h^2*Sqrt[Pi]*(d + e*x)
^3*Erfi[(3 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^n])/(2*Sqrt[b]*Sqrt[f]*n*Sqrt[L
og[F]])])/(2*Sqrt[b]*e^3*E^(9/(4*b*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)
^(3/n)*Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2307

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.)), x
_Symbol] :> Dist[(d + e*x)/(e*n*(c*(d + e*x)^n)^(1/n)), Subst[Int[E^(a*f*Lo
g[F] + x/n + b*f*Log[F]*x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a
, b, c, d, e, f, n}, x]
```

Rule 2308

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^(m + 1)/(h*n*(c*(d +
e*x)^n)^((m + 1)/n)), Subst[Int[E^(a*f*Log[F] + ((m + 1)*x)/n + b*f*Log[F]*
x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m
, n}, x] && EqQ[e*g - d*h, 0]
```

Rule 2309

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[1/e^(m + 1), Subst[Int[ExpandIn
tegrand[F^(f*(a + b*Log[c*x^n]^2)), (e*g - d*h + h*x)^m, x], x], x, d + e*x
], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, n}, x] && IGtQ[m, 0]
```

Rubi steps

$$\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}(g+hx)^2\,dx = \int \left(F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}g^2 + 2F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}ghx + F^{f\left(a+b\log^2(c(d+\right)}\right)$$

$$= g^2\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}\,dx + (2gh)\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}x\,dx + h^2$$

$$= \frac{g^2\text{Subst}\left(\int F^{f\left(a+b\log^2\left(cx^n\right)\right)}\,dx, x, d+ex\right)}{e} + (2gh)\int F^{f\left(a+b\log^2(c(d+ex)\right)}$$

$$= (2gh)\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}x\,dx + h^2\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}x^2\,dx +$$

$$= (2gh)\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}x\,dx + h^2\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}x^2\,dx +$$

$$= \frac{e^{-\frac{1}{4bfn^2\log(F)}}F^{af}g^2\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}\operatorname{erfi}\left(\frac{1+2bfn\log(F)\log(c(d}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

Mathematica [A]
time = 0.45, size = 303, normalized size = 0.81

$$\frac{e^{-\frac{9}{4bfn^2\log(F)}}F^{af}\sqrt{\pi}(d+ex)\left(c(d+ex)^n\right)^{-3/n}\left(-2e^{\frac{5}{4bfn^2\log(F)}}h(-eg+dh)(d+ex)\left(c(d+ex)^n\right)^{\frac{1}{n}}\text{erfi}\left(\frac{1+bfn\log(F)\log\left(c(d+ex)^n\right)}{\sqrt{b}\sqrt{f}n\sqrt{\log(F)}}\right)+e^{\frac{2}{bfn^2\log(F)}}(eg-dh)^2\left(c(d+ex)^n\right)^{2/n}\text{erfi}\left(\frac{1+2bfn\log(F)\log\left(c(d+ex)^n\right)}{2\sqrt{b}\sqrt{f}n\sqrt{\log(F)}}\right)+h^2(d+ex)^2\text{erfi}\left(\frac{3+2bfn\log(F)\log\left(c(d+ex)^n\right)}{2\sqrt{b}\sqrt{f}n\sqrt{\log(F)}}\right)\right)}{2\sqrt{b}e^3\sqrt{f}n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(g + h*x)^2,x]
```

```
[Out] (F^(a*f)*Sqrt[Pi]*(d + e*x)*(-2*E^(5/(4*b*f*n^2*Log[F]))*h*(-(e*g) + d*h)*(
d + e*x)*(c*(d + e*x)^n)^n^(-1)*Erfi[(1 + b*f*n*Log[F]*Log[c*(d + e*x)^n])/
(Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])] + E^(2/(b*f*n^2*Log[F]))*(e*g - d*h)^2*(c
*(d + e*x)^n)^(2/n)*Erfi[(1 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^n])/(2*Sqrt[b]
*Sqrt[f]*n*Sqrt[Log[F]])] + h^2*(d + e*x)^2*Erfi[(3 + 2*b*f*n*Log[F]*Log[c*
(d + e*x)^n])/(2*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])]))/(2*Sqrt[b]*e^3*E^(9/(4*
b*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(3/n)*Sqrt[Log[F]])
```

Maple [F]
time = 0.03, size = 0, normalized size = 0.00

$$\int F^{f\left(a+b\ln\left(c(ex+d)^n\right)^2\right)}(hx+g)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))*(h*x+g)^2,x)
```

```
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))*(h*x+g)^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(h*x+g)^2,x, algorithm="maxima")
```

```
[Out] integrate((h*x + g)^2*F^((b*log((e*x + d)^n*c)^2 + a)*f), x)
```

Fricas [A]
time = 0.37, size = 370, normalized size = 0.99

$$-\frac{\left(\sqrt{\pi}\sqrt{-bfn^2\log(F)}h^2\,\text{erf}\left(\frac{\left(2bfn^2\log(xe+d)\log(F)+2bfn\log(F)\log(c)+3\right)\sqrt{-bfn^2\log(F)}}{2bfn^2\log(F)}\right)e^{\left(\frac{4abf^2n^2\log(F)^2-12bfn\log(F)\log(c)-9}{4bfn^2\log(F)}\right)}+\sqrt{\pi}\sqrt{-bfn^2\log(F)}\left(d^2h^2-2dghe+g^2e^2\right)\text{erf}\left(\frac{\left(2bfn^2\log(xe+d)\log(F)+2bfn\log(F)\log(c)+1\right)\sqrt{-bfn^2\log(F)}}{2bfn^2\log(F)}\right)e^{\left(\frac{4abf^2n^2\log(F)^2-4bfn\log(F)\log(c)-1}{4bfn^2\log(F)}\right)}-2\sqrt{\pi}\sqrt{-bfn^2\log(F)}\left(dh^2-ghe\right)\text{erf}\left(\frac{\left(bfn^2\log(xe+d)\log(F)+bfn\log(F)\log(c)+1\right)\sqrt{-bfn^2\log(F)}}{bfn^2\log(F)}\right)e^{\left(\frac{abf^2n^2\log(F)^2-2bfn\log(F)\log(c)-1}{bfn^2\log(F)}\right)}\right)e^{(-3)}}{2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(h*x+g)^2,x, algorithm="fricas")
```

```
[Out] -1/2*(sqrt(pi)*sqrt(-b*f*n^2*log(F))*h^2*erf(1/2*(2*b*f*n^2*log(x*e + d)*lo
g(F) + 2*b*f*n*log(F)*log(c) + 3)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log(F)))*e
^(1/4*(4*a*b*f^2*n^2*log(F)^2 - 12*b*f*n*log(F)*log(c) - 9)/(b*f*n^2*log(F)
)) + sqrt(pi)*sqrt(-b*f*n^2*log(F))*(d^2*h^2 - 2*d*g*h*e + g^2*e^2)*erf(1/2
*(2*b*f*n^2*log(x*e + d)*log(F) + 2*b*f*n*log(F)*log(c) + 1)*sqrt(-b*f*n^2*
log(F))/(b*f*n^2*log(F)))*e^(1/4*(4*a*b*f^2*n^2*log(F)^2 - 4*b*f*n*log(F)*l
og(c) - 1)/(b*f*n^2*log(F))) - 2*sqrt(pi)*sqrt(-b*f*n^2*log(F))*(d*h^2 - g*
h*e)*erf((b*f*n^2*log(x*e + d)*log(F) + b*f*n*log(F)*log(c) + 1)*sqrt(-b*f*
n^2*log(F))/(b*f*n^2*log(F)))*e^((a*b*f^2*n^2*log(F)^2 - 2*b*f*n*log(F)*log
(c) - 1)/(b*f*n^2*log(F))))*e^(-3)/n
```

Sympy [**B**] Leaf count of result is larger than twice the leaf count of optimal. 1068 vs. $2(343) = 686$.
time = 117.72, size = 1068, normalized size = 2.87

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))*(h*x+g)**2,x)
```

```
[Out] Piecewise((-11*F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*d**3*f*h**2*n**2*
log(F)/(9*e**3) - 11*F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*d**3*f*h**2
*n*log(F)*log(c*(d + e*x)**n)/(9*e**3) + 3*F**(a*f)*F**(b*f*log(c*(d + e*x)
**n)**2)*b*d**2*f*g*h*n**2*log(F)/e**2 + 3*F**(a*f)*F**(b*f*log(c*(d + e*x)
**n)**2)*b*d**2*f*g*h*n*log(F)*log(c*(d + e*x)**n)/e**2 + 11*F**(a*f)*F**(b
*f*log(c*(d + e*x)**n)**2)*b*d**2*f*h**2*n**2*x*log(F)/(9*e**2) - 2*F**(a*f
)*F**(b*f*log(c*(d + e*x)**n)**2)*b*d**2*f*h**2*n*x*log(F)*log(c*(d + e*x)*
*n)/(3*e**2) - 2*F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*d*f*g**2*n**2*l
og(F)/e - 2*F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*d*f*g**2*n*log(F)*lo
g(c*(d + e*x)**n)/e - 3*F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*d*f*g*h*
n**2*x*log(F)/e + 2*F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*d*f*g*h*n*x*
log(F)*log(c*(d + e*x)**n)/e - 5*F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b
*d*f*h**2*n**2*x**2*log(F)/(18*e) + F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2
)*b*d*f*h**2*n*x**2*log(F)*log(c*(d + e*x)**n)/(3*e) + 2*F**(a*f)*F**(b*f*l
og(c*(d + e*x)**n)**2)*b*f*g**2*n**2*x*log(F) - 2*F**(a*f)*F**(b*f*log(c*(d
 + e*x)**n)**2)*b*f*g**2*n*x*log(F)*log(c*(d + e*x)**n) + F**(a*f)*F**(b*f*
log(c*(d + e*x)**n)**2)*b*f*g*h*n**2*x**2*log(F)/2 - F**(a*f)*F**(b*f*log(c
*(d + e*x)**n)**2)*b*f*g*h*n*x**2*log(F)*log(c*(d + e*x)**n) + 2*F**(a*f)*F
**(b*f*log(c*(d + e*x)**n)**2)*b*f*h**2*n**2*x**3*log(F)/27 - 2*F**(a*f)*F*
*(b*f*log(c*(d + e*x)**n)**2)*b*f*h**2*n*x**3*log(F)*log(c*(d + e*x)**n)/9
+ F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*d**3*h**2/(3*e**3) - F**(a*f)*F*
*(b*f*log(c*(d + e*x)**n)**2)*d**2*g*h/e**2 + F**(a*f)*F**(b*f*log(c*(d + e
*x)**n)**2)*d*g**2/e + F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*g**2*x + F*
*(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*g*h*x**2 + F**(a*f)*F**(b*f*log(c*(d
 + e*x)**n)**2)*h**2*x**3/3, Ne(e, 0)), (F**(f*(a + b*log(c*d**n)**2))*(g**
2*x + g*h*x**2 + h**2*x**3/3), True))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(h*x+g)^2,x, algorithm="giac")
[Out] integrate((h*x + g)^2*F^((b*log((x*e + d)^n*c)^2 + a)*f), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int e^{f\ln(F)\left(b\ln(c\,(d+e\,x)^n)^2+a\right)}\,(g+h\,x)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))*(g + h*x)^2,x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n)^2))*(g + h*x)^2, x)
```

3.597 $\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}(g+hx)\,dx$

Optimal. Leaf size=242

$$\frac{e^{-\frac{1}{bfn^2\log(F)}}F^{af}h\sqrt{\pi}\,(d+ex)^2\left(c(d+ex)^n\right)^{-2/n}\operatorname{erfi}\left(\frac{1+bfn\log(F)\log\left(c(d+ex)^n\right)}{\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e^2\sqrt{f}\,n\sqrt{\log(F)}}+\frac{e^{-\frac{1}{4bfn^2\log(F)}}F^{af}(eg-dh)\sqrt{\pi}$$

```
[Out] 1/2*F^(a*f)*h*(e*x+d)^2*erfi((1+b*f*n*ln(F)*ln(c*(e*x+d)^n))/n/b^(1/2)/f^(1
/2)/ln(F)^(1/2))*Pi^(1/2)/e^2/exp(1/b/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(2/n))/
b^(1/2)/f^(1/2)/ln(F)^(1/2)+1/2*F^(a*f)*(-d*h+e*g)*(e*x+d)*erfi(1/2*(1+2*b*
f*n*ln(F)*ln(c*(e*x+d)^n))/n/b^(1/2)/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/e^2/exp(
1/4/b/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(1/n))/b^(1/2)/f^(1/2)/ln(F)^(1/2)
```

Rubi [A]

time = 0.25, antiderivative size = 242, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.192$, Rules used = {2309, 2307, 2266, 2235, 2308}

$$\frac{\sqrt{\pi}\,F^{af}(d+ex)(eg-dh)e^{-\frac{1}{4bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-1/n}\operatorname{Erfi}\left(\frac{2bfn\log(F)\log\left(c(d+ex)^n\right)+1}{2\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e^2\sqrt{f}\,n\sqrt{\log(F)}}+\frac{\sqrt{\pi}\,hF^{af}(d+ex)^2e^{-\frac{1}{bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-2/n}\operatorname{Erfi}\left(\frac{bfn\log(F)\log\left(c(d+ex)^n\right)+1}{\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e^2\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(g + h*x),x]
```

```
[Out] (F^(a*f)*h*Sqrt[Pi]*(d + e*x)^2*Erfi[(1 + b*f*n*Log[F]*Log[c*(d + e*x)^n])/
(Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e^2*E^(1/(b*f*n^2*Log[F]))*Sq
rt[f]*n*(c*(d + e*x)^n)^(2/n)*Sqrt[Log[F]]) + (F^(a*f)*(e*g - d*h)*Sqrt[Pi]
*(d + e*x)*Erfi[(1 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^n])/(2*Sqrt[b]*Sqrt[f]*
n*Sqrt[Log[F]])])/(2*Sqrt[b]*e^2*E^(1/(4*b*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d +
 e*x)^n)^n^(-1)*Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2307

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.)), x
_Symbol] :> Dist[(d + e*x)/(e*n*(c*(d + e*x)^n)^(1/n)), Subst[Int[E^(a*f*Lo
```

```
g[F] + x/n + b*f*Log[F]*x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a
, b, c, d, e, f, n}, x]
```

Rule 2308

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^(m + 1)/(h*n*(c*(d +
e*x)^n)^((m + 1)/n)), Subst[Int[E^(a*f*Log[F] + ((m + 1)*x)/n + b*f*Log[F]*
x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m
, n}, x] && EqQ[e*g - d*h, 0]
```

Rule 2309

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[1/e^(m + 1), Subst[Int[ExpandIn
tegrand[F^(f*(a + b*Log[c*x^n]^2)), (e*g - d*h + h*x)^m, x], x], x, d + e*x
], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, n}, x] && IGtQ[m, 0]
```

Rubi steps

$$\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}(g+hx)\,dx = \int \left(F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}g + F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}hx\right)\,dx$$

$$= g\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}\,dx + h\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}x\,dx$$

$$= \frac{g\text{Subst}\left(\int F^{f\left(a+b\log^2\left(cx^n\right)\right)}\,dx, x, d+ex\right)}{e} + h\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}x\,dx$$

$$= h\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}x\,dx + \frac{\left(g(d+ex)\left(c(d+ex)^n\right)^{-1/n}\right)\text{Subst}\left(\int e^{\ldots}\right.}{\ldots}$$

$$= h\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}x\,dx + \frac{\left(e^{-\frac{1}{4bfn^2\log(F)}}F^{af}g(d+ex)\left(c(d+ex)^n\right)^{-\ldots}\right.}{\ldots}$$

$$= \frac{e^{-\frac{1}{4bfn^2\log(F)}}F^{af}g\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}\text{erfi}\left(\frac{1+2bfn\log(F)\log(c(d+ex\ldots}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F\ldots}}\right.}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

Mathematica [A]
time = 0.24, size = 204, normalized size = 0.84

$$\frac{e^{-\frac{1}{bfn^2\log(F)}}F^{af}\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-2/n}\left(h(d+ex)\text{erfi}\left(\frac{1+bfn\log(F)\log(c(d+ex)^n)}{\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)+e^{\frac{3}{4bfn^2\log(F)}}(eg-dh)\left(c(d+ex)^n\right)^{\frac{1}{n}}\text{erfi}\left(\frac{1+2bfn\log(F)\log(c(d+ex)^n)}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)\right)}{2\sqrt{b}\,e^2\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(g + h*x),x]
```

```
[Out] (F^(a*f)*Sqrt[Pi]*(d + e*x)*(h*(d + e*x)*Erfi[(1 + b*f*n*Log[F]*Log[c*(d +
e*x)^n])/(Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])] + E^(3/(4*b*f*n^2*Log[F]))*(e*g
- d*h)*(c*(d + e*x)^n)^n^(-1)*Erfi[(1 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^n])/
(2*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])]))/(2*Sqrt[b]*e^2*E^(1/(b*f*n^2*Log[F]))
*Sqrt[f]*n*(c*(d + e*x)^n)^(2/n)*Sqrt[Log[F]])
```

Maple [F]
time = 0.03, size = 0, normalized size = 0.00

$$\int F^{f\left(a+b\ln\left(c\left(ex+d\right)^{n}\right)^{2}\right)}\left(hx+g\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))*(h*x+g),x)
```

```
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))*(h*x+g),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(h*x+g),x, algorithm="maxima")
```

```
[Out] integrate((h*x + g)*F^((b*log((e*x + d)^n*c)^2 + a)*f), x)
```

Fricas [A]
time = 0.36, size = 234, normalized size = 0.97

$$\frac{\left(\sqrt{\pi}\,\sqrt{-bfn^{2}\log\left(F\right)}\,(dh-ge)\operatorname{erf}\left(\frac{\left(2\,bfn^{2}\log(xe+d)\log(F)+2\,bfn\log(F)\log(c)+1\right)\sqrt{-bfn^{2}\log\left(F\right)}}{2\,bfn^{2}\log(F)}\right)e^{\left(\frac{4\,abf^{2}n^{2}\log(F)^{2}-4\,bfn\log(F)\log(c)-1}{4\,bfn^{2}\log(F)}\right)}-\sqrt{\pi}\,\sqrt{-bfn^{2}\log\left(F\right)}\,h\operatorname{erf}\left(\frac{\left(bfn^{2}\log(xe+d)\log(F)+bfn\log(F)\log(c)+1\right)\sqrt{-bfn^{2}\log\left(F\right)}}{bfn^{2}\log(F)}\right)e^{\left(\frac{abf^{2}n^{2}\log(F)^{2}-2\,bfn\log(F)\log(c)-1}{bfn^{2}\log(F)}\right)}\right)e^{(-2)}}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(h*x+g),x, algorithm="fricas")
```

```
[Out] 1/2*(sqrt(pi)*sqrt(-b*f*n^2*log(F))*(d*h - g*e)*erf(1/2*(2*b*f*n^2*log(x*e
+ d)*log(F) + 2*b*f*n*log(F)*log(c) + 1)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log
(F)))*e^(1/4*(4*a*b*f^2*n^2*log(F)^2 - 4*b*f*n*log(F)*log(c) - 1)/(b*f*n^2*
log(F))) - sqrt(pi)*sqrt(-b*f*n^2*log(F))*h*erf((b*f*n^2*log(x*e + d)*log(F
) + b*f*n*log(F)*log(c) + 1)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log(F)))*e^((a*
b*f^2*n^2*log(F)^2 - 2*b*f*n*log(F)*log(c) - 1)/(b*f*n^2*log(F))))*e^(-2)/n
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 581 vs. $2(223) = 446$.
time = 27.69, size = 581, normalized size = 2.40

$$\begin{cases} \frac{3F^{af}F^{bf\log(c(d+ex)^n)^2}bd^2fhn^2\log(F)}{2e^2} + \frac{3F^{af}F^{bf\log(c(d+ex)^n)^2}bd^2fhn\log(F)\log(c(d+ex)^n)}{2e^2} - \frac{2F^{af}F^{bf\log(c(d+ex)^n)^2}bdfgn^2\log(F)}{e} - \frac{2F^{af}F^{bf\log(c(d+ex)^n)^2}bdfgn\log(F)\log(c(d+ex)^n)}{e} - \frac{3F^{af}F^{bf\log(c(d+ex)^n)^2}bdfhn^2x\log(F)}{2e} + \frac{F^{af}F^{bf\log(c(d+ex)^n)^2}bdfhnx\log(F)\log(c(d+ex)^n)}{e} + 2F^{af}F^{bf\log(c(d+ex)^n)^2}bfgn^2x\log(F) - 2F^{af}F^{bf\log(c(d+ex)^n)^2}bfgnx\log(F)\log(c(d+ex)^n) + \frac{F^{af}F^{bf\log(c(d+ex)^n)^2}bfhn^2x^2\log(F)}{4} - \frac{F^{af}F^{bf\log(c(d+ex)^n)^2}bfhnx^2\log(F)\log(c(d+ex)^n)}{2} - \frac{F^{af}F^{bf\log(c(d+ex)^n)^2}d^2h}{2e^2} + \frac{F^{af}F^{bf\log(c(d+ex)^n)^2}dg}{e} + F^{af}F^{bf\log(c(d+ex)^n)^2}gx + \frac{F^{af}F^{bf\log(c(d+ex)^n)^2}hx^2}{2} & \text{for}\ e \neq 0 \\ F^{f\left(a+b\log(cd^n)^2\right)}\left(gx + \frac{hx^2}{2}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))*(h*x+g),x)
```

```
[Out] Piecewise((3*F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*d**2*f*h*n**2*log(F
)/(2*e**2) + 3*F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*d**2*f*h*n*log(F)
*log(c*(d + e*x)**n)/(2*e**2) - 2*F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*
b*d*f*g*n**2*log(F)/e - 2*F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*d*f*g*
n*log(F)*log(c*(d + e*x)**n)/e - 3*F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)
*b*d*f*h*n**2*x*log(F)/(2*e) + F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*d
*f*h*n*x*log(F)*log(c*(d + e*x)**n)/e + 2*F**(a*f)*F**(b*f*log(c*(d + e*x)*
*n)**2)*b*f*g*n**2*x*log(F) - 2*F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*
f*g*n*x*log(F)*log(c*(d + e*x)**n) + F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**
2)*b*f*h*n**2*x**2*log(F)/4 - F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*f*
h*n*x**2*log(F)*log(c*(d + e*x)**n)/2 - F**(a*f)*F**(b*f*log(c*(d + e*x)**n
)**2)*d**2*h/(2*e**2) + F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*d*g/e + F*
*(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*g*x + F**(a*f)*F**(b*f*log(c*(d + e*
x)**n)**2)*h*x**2/2, Ne(e, 0)), (F**(f*(a + b*log(c*d**n)**2))*(g*x + h*x**
2/2), True))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(h*x+g),x, algorithm="giac")
```

```
[Out] integrate((h*x + g)*F^((b*log((x*e + d)^n*c)^2 + a)*f), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{e}^{f\,\ln(F)\,\left(b\ln\left(c\,{(d+e\,x)}^n\right)^2+a\right)}\,\left(g+h\,x\right) \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))*(g + h*x),x)
```

```
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n)^2))*(g + h*x), x)
```

3.598 $\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}\,dx$

Optimal. Leaf size=118

$$\frac{e^{-\frac{1}{4bfn^2\log(F)}}F^{af}\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}\operatorname{erfi}\left(\frac{1+2bfn\log(F)\log(c(d+ex)^n)}{2\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

```
[Out] 1/2*F^(a*f)*(e*x+d)*erfi(1/2*(1+2*b*f*n*ln(F)*ln(c*(e*x+d)^n))/n/b^(1/2)/f^
(1/2)/ln(F)^(1/2))*Pi^(1/2)/e/exp(1/4/b/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(1/n)
)/b^(1/2)/f^(1/2)/ln(F)^(1/2)
```

Rubi [A]
time = 0.04, antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.150$, Rules used = {2307, 2266, 2235}

$$\frac{\sqrt{\pi}\,F^{af}(d+ex)e^{-\frac{1}{4bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-1/n}\operatorname{Erfi}\left(\frac{2bfn\log(F)\log(c(d+ex)^n)+1}{2\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2)),x]
```

```
[Out] (F^(a*f)*Sqrt[Pi]*(d + e*x)*Erfi[(1 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^n])/(2
*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(1/(4*b*f*n^2*Log[F]))*Sq
rt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2307

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.)), x
_Symbol] :> Dist[(d + e*x)/(e*n*(c*(d + e*x)^n)^(1/n)), Subst[Int[E^(a*f*Lo
g[F] + x/n + b*f*Log[F]*x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a
, b, c, d, e, f, n}, x]
```

Rubi steps

$$\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}\,dx = \frac{\text{Subst}\left(\int F^{f\left(a+b\log^2\left(cx^n\right)\right)}\,dx, x, d+ex\right)}{e}$$

$$= \frac{\left((d+ex)\left(c(d+ex)^n\right)^{-1/n}\right)\text{Subst}\left(\int e^{\frac{x}{n}+af\log(F)+bfx^2\log(F)}\,dx, x, \log\left(c(d+ex)^n\right.\right.}{en}$$

$$= \frac{\left(e^{-\frac{1}{4bfn^2\log(F)}}F^{af}(d+ex)\left(c(d+ex)^n\right)^{-1/n}\right)\text{Subst}\left(\int e^{\frac{\left(\frac{1}{n}+2bfx\log(F)\right)^2}{4bf\log(F)}}\,dx, x, \log\left(c(\right.\right.}{en}$$

$$= \frac{e^{-\frac{1}{4bfn^2\log(F)}}F^{af}\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}\text{erfi}\left(\frac{1+2bfn\log(F)\log\left(c(d+ex)^n\right)}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

Mathematica [A]
time = 0.05, size = 118, normalized size = 1.00

$$\frac{e^{-\frac{1}{4bfn^2\log(F)}}F^{af}\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}\text{erfi}\left(\frac{1+2bfn\log(F)\log\left(c(d+ex)^n\right)}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2)),x]
```

```
[Out] (F^(a*f)*Sqrt[Pi]*(d + e*x)*Erfi[(1 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^n])/(2
*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(1/(4*b*f*n^2*Log[F]))*Sq
rt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]])
```

Maple [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{f\left(a+b\ln\left(c(ex+d)^n\right)^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2)),x)
```

```
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2)),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2)),x, algorithm="maxima")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c)^2 + a)*f), x)
```

Fricas [A]
time = 0.37, size = 116, normalized size = 0.98

$$-\frac{\sqrt{\pi}\,\sqrt{-bfn^2\log(F)}\,\operatorname{erf}\left(\frac{(2\,bfn^2\log(xe+d)\log(F)+2\,bfn\log(F)\log(c)+1)\,\sqrt{-bfn^2\log(F)}}{2\,bfn^2\log(F)}\right)e^{\left(\frac{4\,abf^2n^2\log(F)^2-4\,bfn\log(F)\log(c)-1}{4\,bfn^2\log(F)}-1\right)}}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2)),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b*f*n^2*log(F))*erf(1/2*(2*b*f*n^2*log(x*e + d)*log(F)
+ 2*b*f*n*log(F)*log(c) + 1)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log(F)))*e^(1/4
*(4*a*b*f^2*n^2*log(F)^2 - 4*b*f*n*log(F)*log(c) - 1)/(b*f*n^2*log(F)) - 1)
/n
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 228 vs. 2(105) = 210.
time = 7.88, size = 228, normalized size = 1.93

$$\begin{cases} -\frac{2F^{af}F^{bf\log(c(d+ex)^n)^2}bdfn^2\log(F)}{e} - \frac{2F^{af}F^{bf\log(c(d+ex)^n)^2}bdfn\log(F)\log(c(d+ex)^n)}{e} + 2F^{af}F^{bf\log(c(d+ex)^n)^2}bfn^2x\log(F) - 2F^{af}F^{bf\log(c(d+ex)^n)^2}bfnx\log(F)\log(c(d+ex)^n) + \frac{F^{af}F^{bf\log(c(d+ex)^n)^2}d}{e} + F^{af}F^{bf\log(c(d+ex)^n)^2}x & \text{for}\ e\neq 0 \\ F^{f\left(a+b\log(cd^n)^2\right)}x & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2)),x)
```

```
[Out] Piecewise((-2*F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*d*f*n**2*log(F)/e
- 2*F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*d*f*n*log(F)*log(c*(d + e*x)
**n)/e + 2*F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*f*n**2*x*log(F) - 2*F
**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*b*f*n*x*log(F)*log(c*(d + e*x)**n)
+ F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)*d/e + F**(a*f)*F**(b*f*log(c*(d
+ e*x)**n)**2)*x, Ne(e, 0)), (F**(f*(a + b*log(c*d**n)**2))*x, True))
```

Giac [A]
time = 3.63, size = 101, normalized size = 0.86

$$-\frac{\sqrt{\pi}\,F^{af}\operatorname{erf}\left(-\sqrt{-bf\log(F)}\,n\log(xe+d)-\sqrt{-bf\log(F)}\,\log(c)-\frac{\sqrt{-bf\log(F)}}{2\,bfn\log(F)}\right)e^{\left(-\frac{1}{4\,bfn^2\log(F)}-1\right)}}{2\,\sqrt{-bf\log(F)}\,c^{\left(\frac{1}{n}\right)}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2)),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*F^(a*f)*erf(-sqrt(-b*f*log(F))*n*log(x*e + d) - sqrt(-b*f*log
(F))*log(c) - 1/2*sqrt(-b*f*log(F))/(b*f*n*log(F)))*e^(-1/4/(b*f*n^2*log(F)
) - 1)/(sqrt(-b*f*log(F))*c^(1/n)*n)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int F^{b\,f\ln\left(c\,{\left(d+e\,x\right)}^n\right)^2}\,F^{a\,f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2)),x)
```

```
[Out] int(F^(b*f*log(c*(d + e*x)^n)^2)*F^(a*f), x)
```

3.599 $\int \frac{F^{f\left(a+b\log^2(c(d+ex)^n)\right)}}{g+hx}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{g+hx},x\right)$$

```
[Out] Unintegrable(F^(f*(a+b*ln(c*(e*x+d)^n)^2))/(h*x+g),x)
```

Rubi [A]
time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{g+hx}\,dx$$

Verification is not applicable to the result.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(g + h*x),x]
```

```
[Out] Defer[Int][F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(g + h*x), x]
```

Rubi steps

$$\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{g+hx}\,dx = \int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{g+hx}\,dx$$

Mathematica [A]
time = 0.60, size = 0, normalized size = 0.00

$$\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{g+hx}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(g + h*x),x]
```

```
[Out] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(g + h*x), x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{F^{f\left(a+b\ln\left(c(ex+d)^n\right)^2\right)}}{hx+g}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))/(h*x+g),x)
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))/(h*x+g),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(h*x+g),x, algorithm="maxima")
[Out] integrate(F^((b*log((e*x + d)^n*c)^2 + a)*f)/(h*x + g), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(h*x+g),x, algorithm="fricas")
[Out] integral(F^(b*f*log((x*e + d)^n*c)^2 + a*f)/(h*x + g), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{f\left(a+b\log\left(c(d+ex)^{n}\right)^{2}\right)}}{g+hx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))/(h*x+g),x)
[Out] Integral(F**(f*(a + b*log(c*(d + e*x)**n)**2))/(g + h*x), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(h*x+g),x, algorithm="giac")
[Out] integrate(F^((b*log((x*e + d)^n*c)^2 + a)*f)/(h*x + g), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\mathrm{e}^{f\ln(F)\left(b\ln(c\,(d+e\,x)^n)^2+a\right)}}{g+h\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))/(g + h*x),x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n)^2))/(g + h*x), x)
```

3.600 $\int \frac{F^{f\left(a+b\log^2(c(d+ex)^n)\right)}}{(g+hx)^2}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{F^{f\left(a+b\log^2(c(d+ex)^n)\right)}}{(g+hx)^2},x\right)$$

```
[Out] Unintegrable(F^(f*(a+b*ln(c*(e*x+d)^n)^2))/(h*x+g)^2,x)
```

Rubi [A]
time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{F^{f\left(a+b\log^2(c(d+ex)^n)\right)}}{(g+hx)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(g + h*x)^2,x]
[Out] Defer[Int][F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(g + h*x)^2, x]
```

Rubi steps

$$\int \frac{F^{f\left(a+b\log^2(c(d+ex)^n)\right)}}{(g+hx)^2}\,dx = \int \frac{F^{f\left(a+b\log^2(c(d+ex)^n)\right)}}{(g+hx)^2}\,dx$$

Mathematica [A]
time = 2.08, size = 0, normalized size = 0.00

$$\int \frac{F^{f\left(a+b\log^2(c(d+ex)^n)\right)}}{(g+hx)^2}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(g + h*x)^2,x]
[Out] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(g + h*x)^2, x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{F^{f\left(a+b\ln(c(ex+d)^n)^2\right)}}{(hx+g)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))/(h*x+g)^2,x)
```

```
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))/(h*x+g)^2,x)
```

Maxima [**A**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(h*x+g)^2,x, algorithm="maxima")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c)^2 + a)*f)/(h*x + g)^2, x)
```

Fricas [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(h*x+g)^2,x, algorithm="fricas")
```

```
[Out] integral(F^(b*f*log((x*e + d)^n*c)^2 + a*f)/(h^2*x^2 + 2*g*h*x + g^2), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))/(h*x+g)**2,x)
```

```
[Out] Timed out
```

Giac [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(h*x+g)^2,x, algorithm="giac")
```

```
[Out] integrate(F^((b*log((x*e + d)^n*c)^2 + a)*f)/(h*x + g)^2, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{e^{f \ln(F) \left(b \ln(c (d+e x)^n)^2+a\right)}}{(g + h x)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))/(g + h*x)^2,x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n)^2))/(g + h*x)^2, x)
```

3.601 $\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(g+hx)^3}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(g+hx)^3},x\right)$$

```
[Out] Unintegrable(F^(f*(a+b*ln(c*(e*x+d)^n)^2))/(h*x+g)^3,x)
```

Rubi [A]
time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(g+hx)^3}\,dx$$

Verification is not applicable to the result.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(g + h*x)^3,x]
[Out] Defer[Int][F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(g + h*x)^3, x]
```

Rubi steps

$$\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(g+hx)^3}\,dx = \int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(g+hx)^3}\,dx$$

Mathematica [A]
time = 2.98, size = 0, normalized size = 0.00

$$\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(g+hx)^3}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(g + h*x)^3,x]
[Out] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(g + h*x)^3, x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{F^{f\left(a+b\ln\left(c(ex+d)^n\right)^2\right)}}{(hx+g)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))/(h*x+g)^3,x)
```

```
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))/(h*x+g)^3,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(h*x+g)^3,x, algorithm="maxima")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c)^2 + a)*f)/(h*x + g)^3, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(h*x+g)^3,x, algorithm="fricas")
```

```
[Out] integral(F^(b*f*log((x*e + d)^n*c)^2 + a*f)/(h^3*x^3 + 3*g*h^2*x^2 + 3*g^2*
h*x + g^3), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))/(h*x+g)**3,x)
```

```
[Out] Timed out
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(h*x+g)^3,x, algorithm="giac")
```

```
[Out] integrate(F^((b*log((x*e + d)^n*c)^2 + a)*f)/(h*x + g)^3, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{e^{f\ln(F)\left(b\ln(c\,(d+e\,x)^n)^2+a\right)}}{(g+h\,x)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))/(g + h*x)^3,x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n)^2))/(g + h*x)^3, x)
```

3.602 $\int F^{f(a+b\log(c(d+ex)^n))^2}(dg+egx)^m\,dx$

Optimal. Leaf size=153

$$\frac{e^{-\frac{(1+m+2abfn\log(F))^2}{4b^2fn^2\log(F)}}F^{a^2f}\sqrt{\pi}\,(d+ex)\,(c(d+ex)^n)^{-\frac{1+m}{n}}\,(dg+egx)^m\text{erfi}\left(\frac{1+m+2abfn\log(F)+2b^2fn\log(F)\log(c(d+ex)^n)}{2b\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

```
[Out] 1/2*F^(a^2*f)*(e*x+d)*(e*g*x+d*g)^m*erfi(1/2*(1+m+2*a*b*f*n*ln(F)+2*b^2*f*n
*ln(F)*ln(c*(e*x+d)^n))/b/n/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e/exp(1/4*(1+m+
2*a*b*f*n*ln(F))^2/b^2/f/n^2/ln(F))/n/((c*(e*x+d)^n)^((1+m)/n))/f^(1/2)/ln(
F)^(1/2)
```

Rubi [A]
time = 0.30, antiderivative size = 153, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.129$, Rules used = {2314, 2308, 2266, 2235}

$$\frac{\sqrt{\pi}\,F^{a^2f}(d+ex)(dg+egx)^m\,(c(d+ex)^n)^{-\frac{m+1}{n}}\exp\left(-\frac{(2abfn\log(F)+m+1)^2}{4b^2fn^2\log(F)}\right)\text{Erfi}\left(\frac{2abfn\log(F)+2b^2fn\log(F)\log(c(d+ex)^n)+m+1}{2b\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(d*g + e*g*x)^m,x]
```

```
[Out] (F^(a^2*f)*Sqrt[Pi]*(d + e*x)*(d*g + e*g*x)^m*Erfi[(1 + m + 2*a*b*f*n*Log[F
] + 2*b^2*f*n*Log[F]*Log[c*(d + e*x)^n])/(2*b*Sqrt[f]*n*Sqrt[Log[F]])])/(2*
b*e*E^((1 + m + 2*a*b*f*n*Log[F])^2/(4*b^2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d +
 e*x)^n)^((1 + m)/n)*Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2308

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^(m + 1)/(h*n*(c*(d +
e*x)^n)^((m + 1)/n)), Subst[Int[E^(a*f*Log[F] + ((m + 1)*x)/n + b*f*Log[F]*
```

```
x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m
, n}, x] && EqQ[e*g - d*h, 0]
```

Rule 2314

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]*(b_.))^2*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^m*((c*(d + e*x)^n)^(2
*a*b*f*Log[F])/(d + e*x)^(m + 2*a*b*f*n*Log[F])), Int[(d + e*x)^(m + 2*a*b*
f*n*Log[F])*F^(a^2*f + b^2*f*Log[c*(d + e*x)^n]^2), x], x] /; FreeQ[{F, a,
b, c, d, e, f, g, h, m, n}, x] && EqQ[e*g - d*h, 0]
```

Rubi steps

$$\int F^{f(a+b\log(c(d+ex)^n))^2}(dg+egx)^m\,dx = \frac{\text{Subst}\left(\int F^{f(a+b\log(cx^n))^2}(gx)^m\,dx,x,d+ex\right)}{e}$$
$$= \frac{\text{Subst}\left(\int F^{a^2f+2abf\log(cx^n)+b^2f\log^2(cx^n)}(gx)^m\,dx,x,d+ex\right)}{e}$$
$$= \frac{\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}(gx)^m\,(cx^n)^{2abf\log(F)}\,dx,x,d+ex\right)}{e}$$
$$= \frac{\left((d+ex)^{-2abfn\log(F)}\,(c(d+ex)^n)^{2abf\log(F)}\right)\text{Subst}\left(\int F^{a^2f+b^2f\log^2(c}\right.}{e}$$
$$= \frac{\left((d+ex)^{-m-2abfn\log(F)}(g(d+ex))^m\,(c(d+ex)^n)^{2abf\log(F)}\right)\text{Subst}\left(\right.}{e}$$
$$= \frac{\left((d+ex)(g(d+ex))^m\,(c(d+ex)^n)^{2abf\log(F)-\frac{1+m+2abfn\log(F)}{n}}\right)\text{Subst}}{}$$
$$= \frac{\left(\exp\left(-\frac{(1+m+2abfn\log(F))^2}{4b^2fn^2\log(F)}\right)F^{a^2f}(d+ex)(g(d+ex))^m\,(c(d+ex)^n)\right.}{}$$
$$= \frac{\exp\left(-\frac{(1+m+2abfn\log(F))^2}{4b^2fn^2\log(F)}\right)F^{a^2f}\sqrt{\pi}\,(d+ex)(g(d+ex))^m\,(c(d+ex}{2be\sqrt{f}\,n\sqrt{\log(F}}$$

Mathematica [F]
time = 0.17, size = 0, normalized size = 0.00

$$\int F^{f(a+b\log(c(d+ex)^n))^2}(dg+egx)^m\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(d*g + e*g*x)^m,x]
[Out] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(d*g + e*g*x)^m, x]
```

Maple [F]
time = 180.00, size = 0, normalized size = 0.00

$$\int F^{f(a+b\ln(c(ex+d)^n))^2}(egx+dg)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)*(e*g*x+d*g)^m,x)
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)*(e*g*x+d*g)^m,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(e*g*x+d*g)^m,x, algorithm="maxima
")
[Out] integrate((e*g*x + d*g)^m*F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

Fricas [A]
time = 0.35, size = 169, normalized size = 1.10

$$-\frac{\sqrt{\pi}\sqrt{-b^2fn^2\log(F)}\,\operatorname{erf}\left(\frac{(2\,b^2fn^2\log(xe+d)\log(F)+2\,b^2fn\log(F)\log(c)+2\,abfn\log(F)+m+1)\sqrt{-b^2fn^2\log(F)}}{2\,b^2fn^2\log(F)}\right)e^{\left(\frac{4\,b^2fmn^2\log(F)\log(g)-4\left(b^2fm+b^2f\right)n\log(F)\log(c)-4\,(abfm+abf)n\log(F)-m^2-2\,m-1}{4\,b^2fn^2\log(F)}-1\right)}}{2\,bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(e*g*x+d*g)^m,x, algorithm="fricas
")
[Out] -1/2*sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*erf(1/2*(2*b^2*f*n^2*log(x*e + d)*log
(F) + 2*b^2*f*n*log(F)*log(c) + 2*a*b*f*n*log(F) + m + 1)*sqrt(-b^2*f*n^2*l
og(F))/(b^2*f*n^2*log(F)))*e^(1/4*(4*b^2*f*m*n^2*log(F)*log(g) - 4*(b^2*f*m
 + b^2*f)*n*log(F)*log(c) - 4*(a*b*f*m + a*b*f)*n*log(F) - m^2 - 2*m - 1)/(
b^2*f*n^2*log(F)) - 1)/(b*n)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{f(a+b\log(c(d+ex)^n))^2}(g(d+ex))^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)*(e*g*x+d*g)**m,x)
```

```
[Out] Integral(F**(f*(a + b*log(c*(d + e*x)**n))**2)*(g*(d + e*x))**m, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(e*g*x+d*g)^m,x, algorithm="giac")
```

```
[Out] integrate((g*x*e + d*g)^m*F^((b*log((x*e + d)^n*c) + a)^2*f), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{e}^{f\,\ln(F)\,\left(a+b\,\ln\left(c\,(d+e\,x)^n\right)\right)^2}\,\left(d\,g+e\,g\,x\right)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)*(d*g + e*g*x)^m,x)
```

```
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2)*(d*g + e*g*x)^m, x)
```

3.603 $\int F^{f(a+b\log(c(d+ex)^n))^2}(dg+egx)^2\,dx$

Optimal. Leaf size=133

$$\frac{e^{-\frac{3(3+4abfn\log(F))}{4b^2fn^2\log(F)}}g^2\sqrt{\pi}\,(d+ex)^3\,(c(d+ex)^n)^{-3/n}\,\mathrm{erfi}\left(\frac{\frac{3}{n}+2abf\log(F)+2b^2f\log(F)\log(c(d+ex)^n)}{2b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

```
[Out] 1/2*g^2*(e*x+d)^3*erfi(1/2*(3/n+2*a*b*f*ln(F)+2*b^2*f*ln(F)*ln(c*(e*x+d)^n)
)/b/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e/exp(3/4*(3+4*a*b*f*n*ln(F))/b^2/f/n^2
/ln(F))/n/((c*(e*x+d)^n)^(3/n))/f^(1/2)/ln(F)^(1/2)
```

Rubi [A]
time = 0.16, antiderivative size = 133, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.129$, Rules used = {2314, 2308, 2266, 2235}

$$\frac{\sqrt{\pi}\,g^2(d+ex)^3\,(c(d+ex)^n)^{-3/n}\exp\left(-\frac{3(4abfn\log(F)+3)}{4b^2fn^2\log(F)}\right)\mathrm{Erfi}\left(\frac{2abf\log(F)+2b^2f\log(F)\log(c(d+ex)^n)+\frac{3}{n}}{2b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(d*g + e*g*x)^2,x]
```

```
[Out] (g^2*Sqrt[Pi]*(d + e*x)^3*Erfi[(3/n + 2*a*b*f*Log[F] + 2*b^2*f*Log[F]*Log[c
*(d + e*x)^n])/(2*b*Sqrt[f]*Sqrt[Log[F]])])/(2*b*e*E^((3*(3 + 4*a*b*f*n*Log
[F]))/(4*b^2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(3/n)*Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2308

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^(m + 1)/(h*n*(c*(d +
e*x)^n)^((m + 1)/n)), Subst[Int[E^(a*f*Log[F] + ((m + 1)*x)/n + b*f*Log[F]*
x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m
```

```
, n}, x] && EqQ[e*g - d*h, 0]
```

Rule 2314

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]*(b_.))^2*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^m*((c*(d + e*x)^n)^(2
*a*b*f*Log[F])/(d + e*x)^(m + 2*a*b*f*n*Log[F])), Int[(d + e*x)^(m + 2*a*b*
f*n*Log[F])*F^(a^2*f + b^2*f*Log[c*(d + e*x)^n]^2), x], x] /; FreeQ[{F, a,
b, c, d, e, f, g, h, m, n}, x] && EqQ[e*g - d*h, 0]
```

Rubi steps

$$\int F^{f(a+b\log(c(d+ex)^n))^2}(dg+egx)^2\,dx = \frac{\text{Subst}\left(\int F^{f(a+b\log(cx^n))^2}g^2x^2\,dx,x,d+ex\right)}{e}$$

$$= \frac{g^2\text{Subst}\left(\int F^{f(a+b\log(cx^n))^2}x^2\,dx,x,d+ex\right)}{e}$$

$$= \frac{g^2\text{Subst}\left(\int F^{a^2f+2abf\log(cx^n)+b^2f\log^2(cx^n)}x^2\,dx,x,d+ex\right)}{e}$$

$$= \frac{g^2\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}x^2(cx^n)^{2abf\log(F)}\,dx,x,d+ex\right)}{e}$$

$$= \frac{\left(g^2(d+ex)^{-2abfn\log(F)}\left(c(d+ex)^n\right)^{2abf\log(F)}\right)\text{Subst}\left(\int F^{a^2f+b^2f\log^2}\right.}{e}$$

$$= \frac{\left(g^2(d+ex)^3\left(c(d+ex)^n\right)^{2abf\log(F)-\frac{3+2abfn\log(F)}{n}}\right)\text{Subst}\left(\int\exp\left(a^2f\right.\right.}{en}$$

$$= \frac{\left(\exp\left(a^2f\log(F)-\frac{(3+2abfn\log(F))^2}{4b^2fn^2\log(F)}\right)g^2(d+ex)^3\left(c(d+ex)^n\right)^{2abf\log}\right.}{}$$

$$= \frac{\exp\left(-\frac{3(3+4abfn\log(F))}{4b^2fn^2\log(F)}\right)g^2\sqrt{\pi}(d+ex)^3\left(c(d+ex)^n\right)^{-3/n}\text{erfi}\left(\frac{\frac{3}{n}+2ab}{}\right.}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Mathematica [A]
time = 0.24, size = 129, normalized size = 0.97

$$\frac{e^{-\frac{3(3+4bfn\log(F)(a+b(-n\log(d+ex)+\log(c(d+ex)^n))))}{4b^2fn^2\log(F)}}g^2\sqrt{\pi}\,\text{erfi}\left(\frac{3+2bfn\log(F)(a+b\log(c(d+ex)^n))}{2b\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(d*g + e*g*x)^2,x]
```

```
[Out] (g^2*Sqrt[Pi]*Erfi[(3 + 2*b*f*n*Log[F]*(a + b*Log[c*(d + e*x)^n]))/(2*b*Sqr
t[f]*n*Sqrt[Log[F]])])/(2*b*e*E^((3*(3 + 4*b*f*n*Log[F]*(a + b*(-(n*Log[d +
 e*x]) + Log[c*(d + e*x)^n]))))/(4*b^2*f*n^2*Log[F]))*Sqrt[f]*n*Sqrt[Log[F]
])
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int F^{f(a+b\ln(c(ex+d)^n))^2}(egx+dg)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)*(e*g*x+d*g)^2,x)
```

```
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)*(e*g*x+d*g)^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(e*g*x+d*g)^2,x, algorithm="maxima
")
```

```
[Out] integrate((e*g*x + d*g)^2*F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

Fricas [A]
time = 0.35, size = 134, normalized size = 1.01

$$-\frac{\sqrt{\pi}\sqrt{-b^2fn^2\log(F)}\,g^2\,\mathrm{erf}\left(\frac{(2\,b^2fn^2\log(xe+d)\log(F)+2\,b^2fn\log(F)\log(c)+2\,abfn\log(F)+3)\sqrt{-b^2fn^2\log(F)}}{2\,b^2fn^2\log(F)}\right)e^{\left(-\frac{3\,(4\,b^2fn\log(F)\log(c)+4\,abfn\log(F)+3)}{4\,b^2fn^2\log(F)}-1\right)}}{2\,bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(e*g*x+d*g)^2,x, algorithm="fricas
")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*g^2*erf(1/2*(2*b^2*f*n^2*log(x*e + d)
*log(F) + 2*b^2*f*n*log(F)*log(c) + 2*a*b*f*n*log(F) + 3)*sqrt(-b^2*f*n^2*l
og(F))/(b^2*f*n^2*log(F)))*e^(-3/4*(4*b^2*f*n*log(F)*log(c) + 4*a*b*f*n*log
(F) + 3)/(b^2*f*n^2*log(F)) - 1)/(b*n)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)*(e*g*x+d*g)**2,x)
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(e*g*x+d*g)^2,x, algorithm="giac")
[Out] integrate((g*x*e + d*g)^2*F^((b*log((x*e + d)^n*c) + a)^2*f), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int e^{f\,\ln(F)\,(a+b\,\ln(c\,(d+e\,x)^n))^2}\,(d\,g+e\,g\,x)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)*(d*g + e*g*x)^2,x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2)*(d*g + e*g*x)^2, x)
```

3.604 $\int F^{f(a+b\log(c(d+ex)^n))^2}(dg+egx)\,dx$

Optimal. Leaf size=122

$$\frac{e^{-\frac{1+2abfn\log(F)}{b^2fn^2\log(F)}}g\sqrt{\pi}\,(d+ex)^2\left(c(d+ex)^n\right)^{-2/n}\operatorname{erfi}\left(\frac{\frac{1}{n}+abf\log(F)+b^2f\log(F)\log(c(d+ex)^n)}{b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

```
[Out] 1/2*g*(e*x+d)^2*erfi((1/n+a*b*f*ln(F)+b^2*f*ln(F)*ln(c*(e*x+d)^n))/b/f^(1/2
)/ln(F)^(1/2))*Pi^(1/2)/b/e/exp((1+2*a*b*f*n*ln(F))/b^2/f/n^2/ln(F))/n/((c*
(e*x+d)^n)^(2/n))/f^(1/2)/ln(F)^(1/2)
```

Rubi [A]
time = 0.15, antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.138$, Rules used = {2314, 2308, 2266, 2235}

$$\frac{\sqrt{\pi}\,g(d+ex)^2\left(c(d+ex)^n\right)^{-2/n}e^{-\frac{2abfn\log(F)+1}{b^2fn^2\log(F)}}\operatorname{Erfi}\left(\frac{abf\log(F)+b^2f\log(F)\log(c(d+ex)^n)+\frac{1}{n}}{b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(d*g + e*g*x),x]
```

```
[Out] (g*Sqrt[Pi]*(d + e*x)^2*Erfi[(n^(-1) + a*b*f*Log[F] + b^2*f*Log[F]*Log[c*(d
 + e*x)^n])/(b*Sqrt[f]*Sqrt[Log[F]])])/(2*b*e*E^((1 + 2*a*b*f*n*Log[F])/(b^
2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(2/n)*Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2308

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^(m + 1)/(h*n*(c*(d +
e*x)^n)^((m + 1)/n)), Subst[Int[E^(a*f*Log[F] + ((m + 1)*x)/n + b*f*Log[F]*
x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m
```

```
, n}, x] && EqQ[e*g - d*h, 0]
```

Rule 2314

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]*(b_.))^2*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^m*((c*(d + e*x)^n)^(2
*a*b*f*Log[F])/(d + e*x)^(m + 2*a*b*f*n*Log[F])), Int[(d + e*x)^(m + 2*a*b*
f*n*Log[F])*F^(a^2*f + b^2*f*Log[c*(d + e*x)^n]^2), x], x] /; FreeQ[{F, a,
b, c, d, e, f, g, h, m, n}, x] && EqQ[e*g - d*h, 0]
```

Rubi steps

$$\int F^{f(a+b\log(c(d+ex)^n))^2}(dg+egx)\,dx = \frac{\text{Subst}\left(\int F^{f(a+b\log(cx^n))^2}gx\,dx, x, d+ex\right)}{e}$$
$$= \frac{g\text{Subst}\left(\int F^{f(a+b\log(cx^n))^2}x\,dx, x, d+ex\right)}{e}$$
$$= \frac{g\text{Subst}\left(\int F^{a^2f+2abf\log(cx^n)+b^2f\log^2(cx^n)}x\,dx, x, d+ex\right)}{e}$$
$$= \frac{g\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}x(cx^n)^{2abf\log(F)}\,dx, x, d+ex\right)}{e}$$
$$= \frac{\left(g(d+ex)^{-2abfn\log(F)}\left(c(d+ex)^n\right)^{2abf\log(F)}\right)\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx}\right.}{e}$$
$$= \frac{\left(g(d+ex)^2\left(c(d+ex)^n\right)^{2abf\log(F)-\frac{2+2abfn\log(F)}{n}}\right)\text{Subst}\left(\int\exp\left(a^2f\log\right.\right.}{en}$$
$$= \frac{\left(\exp\left(a^2f\log(F)-\frac{(2+2abfn\log(F))^2}{4b^2fn^2\log(F)}\right)g(d+ex)^2\left(c(d+ex)^n\right)^{2abf\log(F)}\right.}{}$$
$$= \frac{e^{-\frac{1+2abfn\log(F)}{b^2fn^2\log(F)}}g\sqrt{\pi}\,(d+ex)^2\left(c(d+ex)^n\right)^{-2/n}\text{erfi}\left(\frac{\frac{1}{n}+abf\log(F)+b^2f\log(}{b\sqrt{f}\,\sqrt{\log}}\right.}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Mathematica [A]
time = 0.60, size = 120, normalized size = 0.98

$$\frac{e^{-\frac{1+2abfn\log(F)}{b^2fn^2\log(F)}}g\sqrt{\pi}\,(d+ex)^2\left(c(d+ex)^n\right)^{-2/n}\text{erfi}\left(\frac{1+bfn\log(F)(a+b\log(c(d+ex)^n))}{b\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(d*g + e*g*x),x]
```

```
[Out] (g*Sqrt[Pi]*(d + e*x)^2*Erfi[(1 + b*f*n*Log[F]*(a + b*Log[c*(d + e*x)^n]))/
(b*Sqrt[f]*n*Sqrt[Log[F]])])/(2*b*e*E^((1 + 2*a*b*f*n*Log[F])/(b^2*f*n^2*Lo
g[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(2/n)*Sqrt[Log[F]])
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int F^{f(a+b\ln(c(ex+d)^n))^2}(egx+dg)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)*(e*g*x+d*g),x)
```

```
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)*(e*g*x+d*g),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(e*g*x+d*g),x, algorithm="maxima")
```

```
[Out] integrate((e*g*x + d*g)*F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

Fricas [A]
time = 0.41, size = 128, normalized size = 1.05

$$-\frac{\sqrt{\pi}\sqrt{-b^2fn^2\log(F)}\,g\,\mathrm{erf}\left(\frac{(b^2fn^2\log(xe+d)\log(F)+b^2fn\log(F)\log(c)+abfn\log(F)+1)\sqrt{-b^2fn^2\log(F)}}{b^2fn^2\log(F)}\right)e^{\left(-\frac{2b^2fn\log(F)\log(c)+2abfn\log(F)+1}{b^2fn^2\log(F)}-1\right)}}{2bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(e*g*x+d*g),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*g*erf((b^2*f*n^2*log(x*e + d)*log(F)
+ b^2*f*n*log(F)*log(c) + a*b*f*n*log(F) + 1)*sqrt(-b^2*f*n^2*log(F))/(b^2*
f*n^2*log(F)))*e^(-(2*b^2*f*n*log(F)*log(c) + 2*a*b*f*n*log(F) + 1)/(b^2*f*
n^2*log(F)) - 1)/(b*n)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)*(e*g*x+d*g),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(e*g*x+d*g),x, algorithm="giac")
```

```
[Out] integrate((g*x*e + d*g)*F^((b*log((x*e + d)^n*c) + a)^2*f), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{e}^{f\,\ln(F)\,(a+b\,\ln(c\,(d+e\,x)^n))^2}\,(d\,g+e\,g\,x)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)*(d*g + e*g*x),x)
```

```
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2)*(d*g + e*g*x), x)
```

3.605 $\int F^{f(a+b\log(c(d+ex)^n))^2}\,dx$

Optimal. Leaf size=126

$$\frac{e^{-\frac{1+4abfn\log(F)}{4b^2fn^2\log(F)}}\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}\operatorname{erfi}\left(\frac{\frac{1}{n}+2abf\log(F)+2b^2f\log(F)\log(c(d+ex)^n)}{2b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

```
[Out] 1/2*(e*x+d)*erfi(1/2*(1/n+2*a*b*f*ln(F)+2*b^2*f*ln(F)*ln(c*(e*x+d)^n))/b/f^
(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e/exp(1/4*(1+4*a*b*f*n*ln(F))/b^2/f/n^2/ln(F)
)/n/((c*(e*x+d)^n)^(1/n))/f^(1/2)/ln(F)^(1/2)
```

Rubi [A]
time = 0.14, antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2312, 2308, 2266, 2235}

$$\frac{\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}e^{-\frac{4abfn\log(F)+1}{4b^2fn^2\log(F)}}\operatorname{Erfi}\left(\frac{2abf\log(F)+2b^2f\log(F)\log(c(d+ex)^n)+\frac{1}{n}}{2b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2),x]
```

```
[Out] (Sqrt[Pi]*(d + e*x)*Erfi[(n^(-1) + 2*a*b*f*Log[F] + 2*b^2*f*Log[F]*Log[c*(d
 + e*x)^n])/(2*b*Sqrt[f]*Sqrt[Log[F]])])/(2*b*e*E^((1 + 4*a*b*f*n*Log[F])/(
4*b^2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2308

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^(m + 1)/(h*n*(c*(d +
e*x)^n)^((m + 1)/n)), Subst[Int[E^(a*f*Log[F] + ((m + 1)*x)/n + b*f*Log[F]*
x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m
```

```
, n}, x] && EqQ[e*g - d*h, 0]
```

Rule 2312

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]*(b_.))^2*(f_.)), x
_Symbol] :> Dist[(c*(d + e*x)^n)^(2*a*b*f*Log[F])/(d + e*x)^(2*a*b*f*n*Log[
F]), Int[(d + e*x)^(2*a*b*f*n*Log[F])*F^(a^2*f + b^2*f*Log[c*(d + e*x)^n]^2
), x], x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] &&  !IntegerQ[2*a*b*f*Log[F
]]
```

Rubi steps

$$\int F^{f(a+b\log(c(d+ex)^n))^2}\,dx = \frac{\text{Subst}\left(\int F^{f(a+b\log(cx^n))^2}\,dx,x,d+ex\right)}{e}$$

$$= \frac{\text{Subst}\left(\int F^{a^2f+2abf\log(cx^n)+b^2f\log^2(cx^n)}\,dx,x,d+ex\right)}{e}$$

$$= \frac{\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}(cx^n)^{2abf\log(F)}\,dx,x,d+ex\right)}{e}$$

$$= \frac{\left((d+ex)^{-2abfn\log(F)}\left(c(d+ex)^n\right)^{2abf\log(F)}\right)\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}x^{2abfn\log(F}\right.}{e}$$

$$= \frac{\left((d+ex)\left(c(d+ex)^n\right)^{2abf\log(F)-\frac{1+2abfn\log(F)}{n}}\right)\text{Subst}\left(\int \exp\left(a^2f\log(F)+b^2fx^2\right.\right.}{en}$$

$$= \frac{\left(\exp\left(a^2f\log(F)-\frac{(1+2abfn\log(F))^2}{4b^2fn^2\log(F)}\right)(d+ex)\left(c(d+ex)^n\right)^{2abf\log(F)-\frac{1+2abfn\log(F)}{n}}\right.}{en}$$

$$= \frac{e^{-\frac{1+4abfn\log(F)}{4b^2fn^2\log(F)}}\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}\text{erfi}\left(\frac{\frac{1}{n}+2abf\log(F)+2b^2f\log(F)\log(c(d+ex)}{2b\sqrt{f}\sqrt{\log(F)}}\right.}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Mathematica [A]
time = 0.07, size = 123, normalized size = 0.98

$$\frac{e^{-\frac{1+4abfn\log(F)}{4b^2fn^2\log(F)}}\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}\text{erfi}\left(\frac{1+2bfn\log(F)(a+b\log(c(d+ex)^n))}{2b\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2),x]
```

```
[Out] (Sqrt[Pi]*(d + e*x)*Erfi[(1 + 2*b*f*n*Log[F]*(a + b*Log[c*(d + e*x)^n]))/(2
*b*Sqrt[f]*n*Sqrt[Log[F]])])/(2*b*e*E^((1 + 4*a*b*f*n*Log[F])/(4*b^2*f*n^2*
Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]])
```

Maple [F]
time = 0.03, size = 0, normalized size = 0.00

$$\int F^{f(a+b\ln(c(ex+d)^n))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2),x)
```

```
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2),x, algorithm="maxima")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

Fricas [A]
time = 0.39, size = 131, normalized size = 1.04

$$-\frac{\sqrt{\pi}\,\sqrt{-b^2fn^2\log(F)}\,\operatorname{erf}\left(\frac{\left(2\,b^2fn^2\log(xe+d)\log(F)+2\,b^2fn\log(F)\log(c)+2\,abfn\log(F)+1\right)\sqrt{-b^2fn^2\log(F)}}{2\,b^2fn^2\log(F)}\right)e^{\left(-\frac{4\,b^2fn\log(F)\log(c)+4\,abfn\log(F)+1}{4\,b^2fn^2\log(F)}-1\right)}}{2\,bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*erf(1/2*(2*b^2*f*n^2*log(x*e + d)*log
(F) + 2*b^2*f*n*log(F)*log(c) + 2*a*b*f*n*log(F) + 1)*sqrt(-b^2*f*n^2*log(F
))/(b^2*f*n^2*log(F)))*e^(-1/4*(4*b^2*f*n*log(F)*log(c) + 4*a*b*f*n*log(F)
+ 1)/(b^2*f*n^2*log(F)) - 1)/(b*n)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{f(a+b\log(c(d+ex)^n))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2),x)
[Out] Integral(F**(f*(a + b*log(c*(d + e*x)**n))**2), x)
```

Giac [A]
time = 4.53, size = 116, normalized size = 0.92

$$-\frac{\sqrt{\pi}\,\operatorname{erf}\left(-\sqrt{-f\log\left(F\right)}\,bn\log\left(xe+d\right)-\sqrt{-f\log\left(F\right)}\,b\log\left(c\right)-\sqrt{-f\log\left(F\right)}\,a-\frac{\sqrt{-f\log\left(F\right)}}{2\,bfn\log\left(F\right)}\right)e^{\left(-\frac{a}{bn}-\frac{1}{4\,b^{2}fn^{2}\log\left(F\right)}-1\right)}}{2\,\sqrt{-f\log\left(F\right)}\,bc^{\left(\frac{1}{n}\right)}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2),x, algorithm="giac")
[Out] -1/2*sqrt(pi)*erf(-sqrt(-f*log(F))*b*n*log(x*e + d) - sqrt(-f*log(F))*b*log
(c) - sqrt(-f*log(F))*a - 1/2*sqrt(-f*log(F))/(b*f*n*log(F)))*e^(-a/(b*n) -
 1/4/(b^2*f*n^2*log(F)) - 1)/(sqrt(-f*log(F))*b*c^(1/n)*n)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{e}^{f\,\ln(F)\,{\left(a+b\,\ln\left(c\,{\left(d+e\,x\right)}^n\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2),x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2), x)
```

3.606 $\int \frac{F^{f(a+b\log(c(d+ex)^n))^2}}{dg+egx}\,dx$

Optimal. Leaf size=70

$$\frac{\sqrt{\pi}\,\mathrm{erfi}\left(a\sqrt{f}\,\sqrt{\log(F)}+b\sqrt{f}\,\sqrt{\log(F)}\,\log\left(c(d+ex)^n\right)\right)}{2be\sqrt{f}\,gn\sqrt{\log(F)}}$$

```
[Out] 1/2*erfi(a*f^(1/2)*ln(F)^(1/2)+b*ln(c*(e*x+d)^n)*f^(1/2)*ln(F)^(1/2))*Pi^(1
/2)/b/e/g/n/f^(1/2)/ln(F)^(1/2)
```

Rubi [A]
time = 0.09, antiderivative size = 70, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.129$, Rules used = {2314, 2308, 2266, 2235}

$$\frac{\sqrt{\pi}\,\mathrm{Erfi}\left(a\sqrt{f}\,\sqrt{\log(F)}+b\sqrt{f}\,\sqrt{\log(F)}\,\log\left(c(d+ex)^n\right)\right)}{2be\sqrt{f}\,gn\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(d*g + e*g*x),x]
```

```
[Out] (Sqrt[Pi]*Erfi[a*Sqrt[f]*Sqrt[Log[F]] + b*Sqrt[f]*Sqrt[Log[F]]*Log[c*(d + e
*x)^n]])/(2*b*e*Sqrt[f]*g*n*Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2308

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^(m + 1)/(h*n*(c*(d +
e*x)^n)^((m + 1)/n)), Subst[Int[E^(a*f*Log[F] + ((m + 1)*x)/n + b*f*Log[F]*
x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m
, n}, x] && EqQ[e*g - d*h, 0]
```

Rule 2314

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]*(b_.))^2*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^m*((c*(d + e*x)^n)^(2
*a*b*f*Log[F])/(d + e*x)^(m + 2*a*b*f*n*Log[F])), Int[(d + e*x)^(m + 2*a*b*
f*n*Log[F])*F^(a^2*f + b^2*f*Log[c*(d + e*x)^n]^2), x], x] /; FreeQ[{F, a,
b, c, d, e, f, g, h, m, n}, x] && EqQ[e*g - d*h, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{F^{f(a+b\log(c(d+ex)^n))^2}}{dg+egx}\,dx &= \frac{\text{Subst}\left(\int \frac{F^{f(a+b\log(cx^n))^2}}{gx}\,dx,x,d+ex\right)}{e}\\ &= \frac{\text{Subst}\left(\int \frac{F^{f(a+b\log(cx^n))^2}}{x}\,dx,x,d+ex\right)}{eg}\\ &= \frac{\text{Subst}\left(\int \frac{F^{a^2f+2abf\log(cx^n)+b^2f\log^2(cx^n)}}{x}\,dx,x,d+ex\right)}{eg}\\ &= \frac{\text{Subst}\left(\int \frac{F^{a^2f+b^2f\log^2(cx^n)}(cx^n)^{2abf\log(F)}}{x}\,dx,x,d+ex\right)}{eg}\\ &= \frac{\left((d+ex)^{-2abfn\log(F)}\left(c(d+ex)^n\right)^{2abf\log(F)}\right)\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}x^{-1+2abfn}\right.}{eg}\\ &= \frac{\text{Subst}\left(\int \exp\left(a^2f\log(F)+2abfx\log(F)+b^2fx^2\log(F)\right)\,dx,x,\log\left(c(d+ex)^n\right.\right.}{egn}\\ &= \frac{\text{Subst}\left(\int \exp\left(\frac{\left(2abf\log(F)+2b^2fx\log(F)\right)^2}{4b^2f\log(F)}\right)\,dx,x,\log\left(c(d+ex)^n\right)\right)}{egn}\\ &= \frac{\sqrt{\pi}\,\text{erfi}\left(a\sqrt{f}\,\sqrt{\log(F)}+b\sqrt{f}\,\sqrt{\log(F)}\,\log\left(c(d+ex)^n\right)\right)}{2be\sqrt{f}\,gn\sqrt{\log(F)}}\end{aligned}$$

Mathematica [A]
time = 0.06, size = 59, normalized size = 0.84

$$\frac{\sqrt{\pi}\,\text{erfi}\left(\sqrt{f}\,\sqrt{\log(F)}\left(a+b\log\left(c(d+ex)^n\right)\right)\right)}{2be\sqrt{f}\,gn\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(d*g + e*g*x),x]
[Out] (Sqrt[Pi]*Erfi[Sqrt[f]*Sqrt[Log[F]]*(a + b*Log[c*(d + e*x)^n])])/(2*b*e*Sqr
t[f]*g*n*Sqrt[Log[F]])
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.28, size = 125, normalized size = 1.79

$$-\frac{\sqrt{\pi}\ \mathrm{erf}\left(-b\sqrt{-f\ln(F)}\ \ln\left((ex+d)^{n}\right)+\frac{f\left(a+b\left(\ln(c)-\frac{i\pi\,\mathrm{csgn}(ic(ex+d)^{n})(-\mathrm{csgn}(ic(ex+d)^{n})+\mathrm{csgn}(ic))(-\mathrm{csgn}(ic(ex+d)^{n})+\mathrm{csgn}(i(e}{2}}{\sqrt{-f\ln(F)}}}{2genb\sqrt{-f\ln(F)}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)/(e*g*x+d*g),x)

[Out] -1/2/g/e/n*Pi^(1/2)/b/(-f*ln(F))^(1/2)*erf(-b*(-f*ln(F))^(1/2)*ln((e*x+d)^n
)+f*(a+b*(ln(c)-1/2*I*Pi*csgn(I*c*(e*x+d)^n)*(-csgn(I*c*(e*x+d)^n)+csgn(I*c
))*(-csgn(I*c*(e*x+d)^n)+csgn(I*(e*x+d)^n))))*ln(F)/(-f*ln(F))^(1/2))

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(e*g*x+d*g),x, algorithm="maxima")

[Out] integrate(F^((b*log((e*x + d)^n*c) + a)^2*f)/(e*g*x + d*g), x)

Fricas [A]
time = 0.36, size = 66, normalized size = 0.94

$$-\frac{\sqrt{\pi}\ \sqrt{-b^{2}fn^{2}\log(F)}\ \mathrm{erf}\left(\frac{\sqrt{-b^{2}fn^{2}\log(F)}\,(bn\log(xe+d)+b\log(c)+a)}{bn}\right)e^{(-1)}}{2\,bgn}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(e*g*x+d*g),x, algorithm="fricas")

[Out] -1/2*sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*erf(sqrt(-b^2*f*n^2*log(F))*(b*n*log(
x*e + d) + b*log(c) + a)/(b*n))*e^(-1)/(b*g*n)

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int\frac{F^{a^{2}f}F^{b^{2}f\log(c(d+ex)^{n})^{2}}F^{2abf\log(c(d+ex)^{n})}}{d+ex}\,dx}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)/(e*g*x+d*g),x)

[Out] Integral(F**(a**2*f)*F**(b**2*f*log(c*(d + e*x)**n)**2)*F**(2*a*b*f*log(c*(d + e*x)**n))/(d + e*x), x)/g

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(e*g*x+d*g),x, algorithm="giac")
```

```
[Out] integrate(F^((b*log((x*e + d)^n*c) + a)^2*f)/(g*x*e + d*g), x)
```

Mupad [B]
time = 3.69, size = 63, normalized size = 0.90

$$-\frac{\sqrt{\pi}\,\mathrm{erf}\left(\frac{1\mathrm{i}\,f\,\ln(F)\,\ln(c\,(d+e\,x)^n)\,b^2+1\mathrm{i}\,a\,f\,\ln(F)\,b}{\sqrt{b^2\,f\,\ln(F)}}\right)\,1\mathrm{i}}{2\,e\,g\,n\,\sqrt{b^2\,f\,\ln(F)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)/(d*g + e*g*x),x)
```

```
[Out] -(pi^(1/2)*erf((b^2*f*log(F)*log(c*(d + e*x)^n)*1i + a*b*f*log(F)*1i)/(b^2*f*log(F))^(1/2))*1i)/(2*e*g*n*(b^2*f*log(F))^(1/2))
```

3.607 $\int \frac{F^{f(a+b\log(c(d+ex)^n))^2}}{(dg+egx)^2}\,dx$

Optimal. Leaf size=128

$$-\frac{e^{\frac{a}{bn}-\frac{1}{4b^2fn^2\log(F)}}\sqrt{\pi}\,(c(d+ex)^n)^{\frac{1}{n}}\operatorname{erfi}\left(\frac{\frac{1}{n}-2abf\log(F)-2b^2f\log(F)\log(c(d+ex)^n)}{2b\sqrt{f}\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,g^2n(d+ex)\sqrt{\log(F)}}$$

```
[Out] 1/2*exp(a/b/n-1/4/b^2/f/n^2/ln(F))*(c*(e*x+d)^n)^(1/n)*erfi(1/2*(-1/n+2*a*b
*f*ln(F)+2*b^2*f*ln(F)*ln(c*(e*x+d)^n))/b/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e
/g^2/n/(e*x+d)/f^(1/2)/ln(F)^(1/2)
```

Rubi [A]
time = 0.16, antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.129$, Rules used = {2314, 2308, 2266, 2235}

$$-\frac{\sqrt{\pi}\,(c(d+ex)^n)^{\frac{1}{n}}\,e^{\frac{a}{bn}-\frac{1}{4b^2fn^2\log(F)}}\operatorname{Erfi}\left(\frac{-2abf\log(F)-2b^2f\log(F)\log(c(d+ex)^n)+\frac{1}{n}}{2b\sqrt{f}\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,g^2n\sqrt{\log(F)}\,(d+ex)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(d*g + e*g*x)^2,x]
```

```
[Out] -1/2*(E^(a/(b*n) - 1/(4*b^2*f*n^2*Log[F]))*Sqrt[Pi]*(c*(d + e*x)^n)^n^(-1)*
Erfi[(n^(-1) - 2*a*b*f*Log[F] - 2*b^2*f*Log[F]*Log[c*(d + e*x)^n])/(2*b*Sqr
t[f]*Sqrt[Log[F]])])/(b*e*Sqrt[f]*g^2*n*(d + e*x)*Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2308

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^(m + 1)/(h*n*(c*(d +
e*x)^n)^((m + 1)/n)), Subst[Int[E^(a*f*Log[F] + ((m + 1)*x)/n + b*f*Log[F]*
x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m
```

```
, n}, x] && EqQ[e*g - d*h, 0]
```

Rule 2314

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]*(b_.))^2*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^m*((c*(d + e*x)^n)^(2
*a*b*f*Log[F])/(d + e*x)^(m + 2*a*b*f*n*Log[F])), Int[(d + e*x)^(m + 2*a*b*
f*n*Log[F])*F^(a^2*f + b^2*f*Log[c*(d + e*x)^n]^2), x], x] /; FreeQ[{F, a,
b, c, d, e, f, g, h, m, n}, x] && EqQ[e*g - d*h, 0]
```

Rubi steps

$$\int \frac{F^{f(a+b\log(c(d+ex)^n))^2}}{(dg+egx)^2}\,dx = \frac{\text{Subst}\left(\int \frac{F^{f(a+b\log(cx^n))^2}}{g^2x^2}\,dx, x, d+ex\right)}{e}$$

$$= \frac{\text{Subst}\left(\int \frac{F^{f(a+b\log(cx^n))^2}}{x^2}\,dx, x, d+ex\right)}{eg^2}$$

$$= \frac{\text{Subst}\left(\int \frac{F^{a^2f+2abf\log(cx^n)+b^2f\log^2(cx^n)}}{x^2}\,dx, x, d+ex\right)}{eg^2}$$

$$= \frac{\text{Subst}\left(\int \frac{F^{a^2f+b^2f\log^2(cx^n)}(cx^n)^{2abf\log(F)}}{x^2}\,dx, x, d+ex\right)}{eg^2}$$

$$= \frac{\left((d+ex)^{-2abfn\log(F)}\left(c(d+ex)^n\right)^{2abf\log(F)}\right)\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}x^{-2+2abfn}\right.}{eg^2}$$

$$= \frac{\left(c(d+ex)^n\right)^{2abf\log(F)-\frac{-1+2abfn\log(F)}{n}}\text{Subst}\left(\int \exp\left(a^2f\log(F)+b^2fx^2\log(F)+\right.\right.}{eg^2n(d+ex)}$$

$$= \frac{\left(e^{\frac{a}{bn}-\frac{1}{4b^2fn^2\log(F)}}\left(c(d+ex)^n\right)^{2abf\log(F)-\frac{-1+2abfn\log(F)}{n}}\right)\text{Subst}\left(\int \exp\left(\frac{\left(2b^2fx\log(F)\right.}{4b^2}\right.\right.}{eg^2n(d+ex)}$$

$$= -\frac{e^{\frac{a}{bn}-\frac{1}{4b^2fn^2\log(F)}}\sqrt{\pi}\left(c(d+ex)^n\right)^{\frac{1}{n}}\text{erfi}\left(\frac{\frac{1}{n}-2abf\log(F)-2b^2f\log(F)\log(c(d+ex)^n)}{2b\sqrt{f}\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,g^2n(d+ex)\sqrt{\log(F)}}$$

Mathematica [A]
time = 0.21, size = 126, normalized size = 0.98

$$\frac{e^{\frac{-1+4abfn\log(F)}{4b^2fn^2\log(F)}}\sqrt{\pi}\left(c(d+ex)^n\right)^{\frac{1}{n}}\text{erfi}\left(\frac{-1+2bfn\log(F)(a+b\log(c(d+ex)^n))}{2b\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,g^2n(d+ex)\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(d*g + e*g*x)^2,x]
```

```
[Out] (E^((-1 + 4*a*b*f*n*Log[F])/(4*b^2*f*n^2*Log[F]))*Sqrt[Pi]*(c*(d + e*x)^n)^
n^(-1)*Erfi[(-1 + 2*b*f*n*Log[F]*(a + b*Log[c*(d + e*x)^n]))/(2*b*Sqrt[f]*n
*Sqrt[Log[F]])])/(2*b*e*Sqrt[f]*g^2*n*(d + e*x)*Sqrt[Log[F]])
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{F^{f(a+b\ln(c(ex+d)^n))^2}}{(egx+dg)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)/(e*g*x+d*g)^2,x)
```

```
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)/(e*g*x+d*g)^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(e*g*x+d*g)^2,x, algorithm="maxima
")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c) + a)^2*f)/(e*g*x + d*g)^2, x)
```

Fricas [A]
time = 0.35, size = 134, normalized size = 1.05

$$-\frac{\sqrt{\pi}\,\sqrt{-b^2fn^2\log(F)}\,\operatorname{erf}\left(\frac{(2\,b^2fn^2\log(xe+d)\log(F)+2\,b^2fn\log(F)\log(c)+2\,abfn\log(F)-1)\sqrt{-b^2fn^2\log(F)}}{2\,b^2fn^2\log(F)}\right)e^{\left(\frac{4\,b^2fn\log(F)\log(c)+4\,abfn\log(F)-1}{4\,b^2fn^2\log(F)}-1\right)}}{2\,bg^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(e*g*x+d*g)^2,x, algorithm="fricas
")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*erf(1/2*(2*b^2*f*n^2*log(x*e + d)*log
(F) + 2*b^2*f*n*log(F)*log(c) + 2*a*b*f*n*log(F) - 1)*sqrt(-b^2*f*n^2*log(F
))/(b^2*f*n^2*log(F)))*e^(1/4*(4*b^2*f*n*log(F)*log(c) + 4*a*b*f*n*log(F) -
 1)/(b^2*f*n^2*log(F)) - 1)/(b*g^2*n)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)/(e*g*x+d*g)**2,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(e*g*x+d*g)^2,x, algorithm="giac")
```

```
[Out] integrate(F^((b*log((x*e + d)^n*c) + a)^2*f)/(g*x*e + d*g)^2, x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{e}^{f\,\ln(F)\,{\left(a+b\,\ln\left(c\,{\left(d+e\,x\right)}^n\right)\right)}^2}}{{\left(d\,g+e\,g\,x\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)/(d*g + e*g*x)^2,x)
```

```
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2)/(d*g + e*g*x)^2, x)
```

3.608 $\int \frac{F^{f(a+b\log(c(d+ex)^n))^2}}{(dg+egx)^3}\,dx$

Optimal. Leaf size=126

$$-\frac{e^{-\frac{1-2abfn\log(F)}{b^2fn^2\log(F)}}\sqrt{\pi}\,(c(d+ex)^n)^{2/n}\operatorname{erfi}\left(\frac{\frac{1}{n}-abf\log(F)-b^2f\log(F)\log(c(d+ex)^n)}{b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,g^3n(d+ex)^2\sqrt{\log(F)}}$$

```
[Out] 1/2*(c*(e*x+d)^n)^(2/n)*erfi((-1/n+a*b*f*ln(F)+b^2*f*ln(F)*ln(c*(e*x+d)^n))
/b/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e/exp((1-2*a*b*f*n*ln(F))/b^2/f/n^2/ln(F
))/g^3/n/(e*x+d)^2/f^(1/2)/ln(F)^(1/2)
```

Rubi [A]
time = 0.16, antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.129$, Rules used = {2314, 2308, 2266, 2235}

$$-\frac{\sqrt{\pi}\,(c(d+ex)^n)^{2/n}\,e^{-\frac{1-2abfn\log(F)}{b^2fn^2\log(F)}}\operatorname{Erfi}\left(\frac{-abf\log(F)+b^2(-f)\log(F)\log(c(d+ex)^n)+\frac{1}{n}}{b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,g^3n\sqrt{\log(F)}\,(d+ex)^2}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(d*g + e*g*x)^3,x]
```

```
[Out] -1/2*(Sqrt[Pi]*(c*(d + e*x)^n)^(2/n)*Erfi[(n^(-1) - a*b*f*Log[F] - b^2*f*Lo
g[F]*Log[c*(d + e*x)^n])/(b*Sqrt[f]*Sqrt[Log[F]])])/(b*e*E^((1 - 2*a*b*f*n*
Log[F])/(b^2*f*n^2*Log[F]))*Sqrt[f]*g^3*n*(d + e*x)^2*Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2308

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^(m + 1)/(h*n*(c*(d +
e*x)^n)^((m + 1)/n)), Subst[Int[E^(a*f*Log[F] + ((m + 1)*x)/n + b*f*Log[F]*
x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m
```

```
, n}, x] && EqQ[e*g - d*h, 0]
```

Rule 2314

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]*(b_.))^2*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^m*((c*(d + e*x)^n)^(2
*a*b*f*Log[F])/(d + e*x)^(m + 2*a*b*f*n*Log[F])), Int[(d + e*x)^(m + 2*a*b*
f*n*Log[F])*F^(a^2*f + b^2*f*Log[c*(d + e*x)^n]^2), x], x] /; FreeQ[{F, a,
b, c, d, e, f, g, h, m, n}, x] && EqQ[e*g - d*h, 0]
```

Rubi steps

$$\int \frac{F^{f(a+b\log(c(d+ex)^n))^2}}{(dg+egx)^3}\,dx = \frac{\text{Subst}\left(\int \frac{F^{f(a+b\log(cx^n))^2}}{g^3x^3}\,dx, x, d+ex\right)}{e}$$
$$= \frac{\text{Subst}\left(\int \frac{F^{f(a+b\log(cx^n))^2}}{x^3}\,dx, x, d+ex\right)}{eg^3}$$
$$= \frac{\text{Subst}\left(\int \frac{F^{a^2f+2abf\log(cx^n)+b^2f\log^2(cx^n)}}{x^3}\,dx, x, d+ex\right)}{eg^3}$$
$$= \frac{\text{Subst}\left(\int \frac{F^{a^2f+b^2f\log^2(cx^n)}(cx^n)^{2abf\log(F)}}{x^3}\,dx, x, d+ex\right)}{eg^3}$$
$$= \frac{\left((d+ex)^{-2abfn\log(F)}\left(c(d+ex)^n\right)^{2abf\log(F)}\right)\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}x^{-3+2abfn}\right.}{eg^3}$$
$$= \frac{\left(c(d+ex)^n\right)^{2abf\log(F)-\frac{-2+2abfn\log(F)}{n}}\text{Subst}\left(\int \exp\left(a^2f\log(F)+b^2fx^2\log(F)+\right.\right.}{eg^3n(d+ex)^2}$$
$$= \frac{\left(\exp\left(a^2f\log(F)-\frac{(-2+2abfn\log(F))^2}{4b^2fn^2\log(F)}\right)\left(c(d+ex)^n\right)^{2abf\log(F)-\frac{-2+2abfn\log(F)}{n}}\right)\text{Subs}}{eg^3n(d+ex)^2}$$
$$= -\frac{e^{-\frac{1-2abfn\log(F)}{b^2fn^2\log(F)}}\sqrt{\pi}\left(c(d+ex)^n\right)^{2/n}\text{erfi}\left(\frac{\frac{1}{n}-abf\log(F)-b^2f\log(F)\log(c(d+ex)^n)}{b\sqrt{f}\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,g^3n(d+ex)^2\sqrt{\log(F)}}$$

Mathematica [A]
time = 0.22, size = 121, normalized size = 0.96

$$\frac{e^{\frac{-1+2abfn\log(F)}{b^2fn^2\log(F)}}\sqrt{\pi}\left(c(d+ex)^n\right)^{2/n}\text{erfi}\left(\frac{-1+bfn\log(F)(a+b\log(c(d+ex)^n))}{b\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,g^3n(d+ex)^2\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(d*g + e*g*x)^3,x]
```

```
[Out] (E^((-1 + 2*a*b*f*n*Log[F])/(b^2*f*n^2*Log[F]))*Sqrt[Pi]*(c*(d + e*x)^n)^(2
/n)*Erfi[(-1 + b*f*n*Log[F]*(a + b*Log[c*(d + e*x)^n]))/(b*Sqrt[f]*n*Sqrt[L
og[F]])])/(2*b*e*Sqrt[f]*g^3*n*(d + e*x)^2*Sqrt[Log[F]])
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{F^{f(a+b\ln(c(ex+d)^n))^2}}{(egx+dg)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)/(e*g*x+d*g)^3,x)
```

```
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)/(e*g*x+d*g)^3,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(e*g*x+d*g)^3,x, algorithm="maxima
")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c) + a)^2*f)/(e*g*x + d*g)^3, x)
```

Fricas [A]
time = 0.36, size = 129, normalized size = 1.02

$$-\frac{\sqrt{\pi}\,\sqrt{-b^2fn^2\log(F)}\,\operatorname{erf}\left(\frac{(b^2fn^2\log(xe+d)\log(F)+b^2fn\log(F)\log(c)+abfn\log(F)-1)\sqrt{-b^2fn^2\log(F)}}{b^2fn^2\log(F)}\right)e^{\left(\frac{2b^2fn\log(F)\log(c)+2abfn\log(F)-1}{b^2fn^2\log(F)}-1\right)}}{2bg^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(e*g*x+d*g)^3,x, algorithm="fricas
")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*erf((b^2*f*n^2*log(x*e + d)*log(F) +
b^2*f*n*log(F)*log(c) + a*b*f*n*log(F) - 1)*sqrt(-b^2*f*n^2*log(F))/(b^2*f*
n^2*log(F)))*e^((2*b^2*f*n*log(F)*log(c) + 2*a*b*f*n*log(F) - 1)/(b^2*f*n^2
*log(F)) - 1)/(b*g^3*n)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)/(e*g*x+d*g)**3,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(e*g*x+d*g)^3,x, algorithm="giac")
```

```
[Out] integrate(F^((b*log((x*e + d)^n*c) + a)^2*f)/(g*x*e + d*g)^3, x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{e}^{f\,\ln(F)\,\left(a+b\,\ln\left(c\,{\left(d+e\,x\right)}^n\right)\right)^2}}{{\left(d\,g+e\,g\,x\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)/(d*g + e*g*x)^3,x)
```

```
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2)/(d*g + e*g*x)^3, x)
```

3.609 $\int F^{f(a+b\log(c(d+ex)^n))^2}(g+hx)^m\,dx$

Optimal. Leaf size=31

$$\operatorname{Int}\left(F^{f(a+b\log(c(d+ex)^n))^2}(g+hx)^m,x\right)$$

```
[Out] Unintegrable(F^(f*(a+b*ln(c*(e*x+d)^n))^2)*(h*x+g)^m,x)
```

Rubi [A]
time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int F^{f(a+b\log(c(d+ex)^n))^2}(g+hx)^m\,dx$$

Verification is not applicable to the result.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(g + h*x)^m,x]
[Out] Defer[Int][F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(g + h*x)^m, x]
```

Rubi steps

$$\int F^{f(a+b\log(c(d+ex)^n))^2}(g+hx)^m\,dx = \int F^{f(a+b\log(c(d+ex)^n))^2}(g+hx)^m\,dx$$

Mathematica [A]
time = 1.26, size = 0, normalized size = 0.00

$$\int F^{f(a+b\log(c(d+ex)^n))^2}(g+hx)^m\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(g + h*x)^m,x]
[Out] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(g + h*x)^m, x]
```

Maple [A]
time = 0.02, size = 0, normalized size = 0.00

$$\int F^{f(a+b\ln(c(ex+d)^n))^2}(hx+g)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)*(h*x+g)^m,x)
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)*(h*x+g)^m,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(h*x+g)^m,x, algorithm="maxima")
[Out] integrate((h*x + g)^m*F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(h*x+g)^m,x, algorithm="fricas")
[Out] integral((h*x + g)^m*F^(b^2*f*log((x*e + d)^n*c)^2 + 2*a*b*f*log((x*e + d)^
n*c) + a^2*f), x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)*(h*x+g)**m,x)
[Out] Exception raised: HeuristicGCDFailed >> no luck
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(h*x+g)^m,x, algorithm="giac")
[Out] integrate((h*x + g)^m*F^((b*log((x*e + d)^n*c) + a)^2*f), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \mathrm{e}^{f\,\ln(F)\,(a+b\,\ln(c\,(d+e\,x)^n))^2}\,(g+h\,x)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)*(g + h*x)^m,x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2)*(g + h*x)^m, x)
```

3.610 $\int F^{f(a+b\log(c(d+ex)^n))^2}(g+hx)^3\,dx$

Optimal. Leaf size=535

$$\frac{3e^{-\frac{1+2abfn\log(F)}{b^2fn^2\log(F)}}h(eg-dh)^2\sqrt{\pi}\,(d+ex)^2\,(c(d+ex)^n)^{-2/n}\operatorname{erfi}\left(\frac{\frac{1}{n}+abf\log(F)+b^2f\log(F)\log(c(d+ex)^n)}{b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be^4\sqrt{f}\,n\sqrt{\log(F)}}+\frac{e^{-\frac{4(1+abfn}{b^2fn^2\log}}}{}$$

[Out] 3/2*h*(-d*h+e*g)^2*(e*x+d)^2*erfi((1/n+a*b*f*ln(F)+b^2*f*ln(F)*ln(c*(e*x+d)^n))/b/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e^4/exp((1+2*a*b*f*n*ln(F))/b^2/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(2/n))/f^(1/2)/ln(F)^(1/2)+1/2*h^3*(e*x+d)^4*erfi((2/n+a*b*f*ln(F)+b^2*f*ln(F)*ln(c*(e*x+d)^n))/b/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e^4/exp(4*(1+a*b*f*n*ln(F))/b^2/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(4/n))/f^(1/2)/ln(F)^(1/2)+1/2*(-d*h+e*g)^3*(e*x+d)*erfi(1/2*(1/n+2*a*b*f*ln(F)+2*b^2*f*ln(F)*ln(c*(e*x+d)^n))/b/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e^4/exp(1/4*(1+4*a*b*f*n*ln(F))/b^2/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(1/n))/f^(1/2)/ln(F)^(1/2)+3/2*h^2*(-d*h+e*g)*(e*x+d)^3*erfi(1/2*(3/n+2*a*b*f*ln(F)+2*b^2*f*ln(F)*ln(c*(e*x+d)^n))/b/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e^4/exp(3/4*(3+4*a*b*f*n*ln(F))/b^2/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(3/n))/f^(1/2)/ln(F)^(1/2)

Rubi [A]

time = 0.84, antiderivative size = 535, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 6, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.214$, Rules used = {2315, 2312, 2308, 2266, 2235, 2314}

$$\frac{3\sqrt{\pi}\,h^2(d+ex)^3(eg-dh)\,(c(d+ex)^n)^{-3/n}\exp\left(-\frac{3(4abfn\log(F)+3)}{4b^2fn^2\log(F)}\right)\operatorname{Erfi}\left(\frac{2abf\log(F)+2b^2f\log(F)\log(c(d+ex)^n)+\frac{3}{n}}{2b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be^4\sqrt{f}\,n\sqrt{\log(F)}}+\frac{3\sqrt{\pi}\,h(d+ex)^2(eg-dh)^2\,(c(d+ex)^n)^{-2/n}\,e^{-\frac{2abfn\log(F)+1}{b^2fn^2\log(F)}}\operatorname{Erfi}\left(\frac{abf\log(F)+b^2f\log(F)\log(c(d+ex)^n)+\frac{1}{n}}{b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be^4\sqrt{f}\,n\sqrt{\log(F)}}+\frac{\sqrt{\pi}\,(d+ex)(eg-dh)^3\,(c(d+ex)^n)^{-1/n}\,e^{-\frac{4abfn\log(F)+1}{4b^2fn^2\log(F)}}\operatorname{Erfi}\left(\frac{2abf\log(F)+2b^2f\log(F)\log(c(d+ex)^n)+\frac{1}{n}}{2b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be^4\sqrt{f}\,n\sqrt{\log(F)}}+\frac{\sqrt{\pi}\,h^3(d+ex)^4\,(c(d+ex)^n)^{-4/n}\,e^{-\frac{4(abfn\log(F)+1)}{b^2fn^2\log(F)}}\operatorname{Erfi}\left(\frac{abf\log(F)+b^2f\log(F)\log(c(d+ex)^n)+\frac{2}{n}}{b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be^4\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(g + h*x)^3,x]

[Out] (3*h*(e*g - d*h)^2*Sqrt[Pi]*(d + e*x)^2*Erfi[(n^(-1) + a*b*f*Log[F] + b^2*f*Log[F]*Log[c*(d + e*x)^n])/(b*Sqrt[f]*Sqrt[Log[F]])])/(2*b*e^4*E^((1 + 2*a*b*f*n*Log[F])/(b^2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(2/n)*Sqrt[Log[F]]) + (h^3*Sqrt[Pi]*(d + e*x)^4*Erfi[(2/n + a*b*f*Log[F] + b^2*f*Log[F]*Log[c*(d + e*x)^n])/(b*Sqrt[f]*Sqrt[Log[F]])])/(2*b*e^4*E^((4*(1 + a*b*f*n*Log[F]))/(b^2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(4/n)*Sqrt[Log[F]]) + ((e*g - d*h)^3*Sqrt[Pi]*(d + e*x)*Erfi[(n^(-1) + 2*a*b*f*Log[F] + 2*b^2*f*Log[F]*Log[c*(d + e*x)^n])/(2*b*Sqrt[f]*Sqrt[Log[F]])])/(2*b*e^4*E^((1 + 4*a*b*f*n*Log[F])/(4*b^2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]]) + (3*h^2*(e*g - d*h)*Sqrt[Pi]*(d + e*x)^3*Erfi[(3/n + 2*a*b*f*Log[F] + 2*b^2*f*Log[F]*Log[c*(d + e*x)^n])/(2*b*Sqrt[f]*Sqrt[Log[F]])])/(2*b*e^4*E^((3*(3 + 4*a*b*f*n*Log[F]))/(4*b^2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(3/n)*Sqrt[Log[F]])

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2308

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^(m + 1)/(h*n*(c*(d +
e*x)^n)^((m + 1)/n)), Subst[Int[E^(a*f*Log[F] + ((m + 1)*x)/n + b*f*Log[F]*
x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m
, n}, x] && EqQ[e*g - d*h, 0]
```

Rule 2312

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]*(b_.))^2*(f_.)), x
_Symbol] :> Dist[(c*(d + e*x)^n)^(2*a*b*f*Log[F])/(d + e*x)^(2*a*b*f*n*Log[
F]), Int[(d + e*x)^(2*a*b*f*n*Log[F])*F^(a^2*f + b^2*f*Log[c*(d + e*x)^n]^2
), x], x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] &&  !IntegerQ[2*a*b*f*Log[F
]]
```

Rule 2314

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]*(b_.))^2*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^m*((c*(d + e*x)^n)^(2
*a*b*f*Log[F])/(d + e*x)^(m + 2*a*b*f*n*Log[F])), Int[(d + e*x)^(m + 2*a*b*
f*n*Log[F])*F^(a^2*f + b^2*f*Log[c*(d + e*x)^n]^2), x], x] /; FreeQ[{F, a,
b, c, d, e, f, g, h, m, n}, x] && EqQ[e*g - d*h, 0]
```

Rule 2315

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]*(b_.))^2*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[1/e^(m + 1), Subst[Int[ExpandIn
tegrand[F^(f*(a + b*Log[c*x^n])^2), (e*g - d*h + h*x)^m, x], x], x, d + e*x
], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, n}, x] && IGtQ[m, 0]
```

Rubi steps

$$\int F^{f(a+b\log(c(d+ex)^n))^2}(g+hx)^3\,dx = \int \left(F^{f(a+b\log(c(d+ex)^n))^2}g^3 + 3F^{f(a+b\log(c(d+ex)^n))^2}g^2hx + 3F^{f(a+b\log(c(d+$$

$$= g^3\int F^{f(a+b\log(c(d+ex)^n))^2}\,dx + \left(3g^2h\right)\int F^{f(a+b\log(c(d+ex)^n))^2}x\,dx + \left(3g\right.$$

$$= \frac{g^3\text{Subst}\left(\int F^{f(a+b\log(cx^n))^2}\,dx, x, d+ex\right)}{e} + \left(3g^2h\right)\int F^{f(a+b\log(c(d+ex)}$$

$$= \frac{g^3\text{Subst}\left(\int F^{a^2f+2abf\log(cx^n)+b^2f\log^2(cx^n)}\,dx, x, d+ex\right)}{e} + \left(3g^2h\right)\int F^{f(}$$

$$= \frac{g^3\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}\left(cx^n\right)^{2abf\log(F)}\,dx, x, d+ex\right)}{e} + \left(3g^2h\right)\int$$

$$= \left(3g^2h\right)\int F^{f(a+b\log(c(d+ex)^n))^2}x\,dx + \left(3gh^2\right)\int F^{f(a+b\log(c(d+ex)^n))^2}x^2\,dx$$

$$= \left(3g^2h\right)\int F^{f(a+b\log(c(d+ex)^n))^2}x\,dx + \left(3gh^2\right)\int F^{f(a+b\log(c(d+ex)^n))^2}x^2\,dx$$

$$= \left(3g^2h\right)\int F^{f(a+b\log(c(d+ex)^n))^2}x\,dx + \left(3gh^2\right)\int F^{f(a+b\log(c(d+ex)^n))^2}x^2\,dx$$

$$= \frac{e^{-\frac{1+4abfn\log(F)}{4b^2fn^2\log(F)}}g^3\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}\text{erfi}\left(\frac{\frac{1}{n}+2abf\log(F)+2b^2f\log}{2b\sqrt{f}\sqrt{\log}}\right.}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Mathematica [A]
time = 2.08, size = 434, normalized size = 0.81

$$\frac{e^{-\frac{4(1+abfn\log(F))}{b^2fn^2\log(F)}}\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-4/n}\left(3e^{\frac{3+2abfn\log(F)}{b^2fn^2\log(F)}}h(eg-dh)^2(d+ex)\left(c(d+ex)^n\right)^{2/n}\text{erfi}\left(\frac{1+bfn\log(F)(a+b\log(c(d+ex)^n))}{b\sqrt{f}\,n\sqrt{\log(F)}}\right)+h^3(d+ex)^3\text{erfi}\left(\frac{2+bfn\log(F)(a+b\log(c(d+ex)^n))}{b\sqrt{f}\,n\sqrt{\log(F)}}\right)+e^{\frac{7+4abfn\log(F)}{4b^2fn^2\log(F)}}(eg-dh)\left(c(d+ex)^n\right)^{\frac{1}{n}}\left(e^{\frac{2+2abfn\log(F)}{b^2fn^2\log(F)}}(eg-dh)^2\left(c(d+ex)^n\right)^{2/n}\text{erfi}\left(\frac{1+2bfn\log(F)(a+b\log(c(d+ex)^n))}{2b\sqrt{f}\,n\sqrt{\log(F)}}\right)+3h^2(d+ex)^2\text{erfi}\left(\frac{3+2bfn\log(F)(a+b\log(c(d+ex)^n))}{2b\sqrt{f}\,n\sqrt{\log(F)}}\right)\right)\right)}{2be^4\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(g + h*x)^3,x]
```

```
[Out] (Sqrt[Pi]*(d + e*x)*(3*E^((3 + 2*a*b*f*n*Log[F])/(b^2*f*n^2*Log[F]))*h*(e*g
 - d*h)^2*(d + e*x)*(c*(d + e*x)^n)^(2/n)*Erfi[(1 + b*f*n*Log[F]*(a + b*Log
[c*(d + e*x)^n]))/(b*Sqrt[f]*n*Sqrt[Log[F]])] + h^3*(d + e*x)^3*Erfi[(2 + b
*f*n*Log[F]*(a + b*Log[c*(d + e*x)^n]))/(b*Sqrt[f]*n*Sqrt[Log[F]])] + E^((7
 + 4*a*b*f*n*Log[F])/(4*b^2*f*n^2*Log[F]))*(e*g - d*h)*(c*(d + e*x)^n)^n^(-
1)*(E^((2 + 2*a*b*f*n*Log[F])/(b^2*f*n^2*Log[F]))*(e*g - d*h)^2*(c*(d + e*x
)^n)^(2/n)*Erfi[(1 + 2*b*f*n*Log[F]*(a + b*Log[c*(d + e*x)^n]))/(2*b*Sqrt[f
```

```
]*n*Sqrt[Log[F]])] + 3*h^2*(d + e*x)^2*Erfi[(3 + 2*b*f*n*Log[F]*(a + b*Log[
c*(d + e*x)^n]))/(2*b*Sqrt[f]*n*Sqrt[Log[F]])])))/(2*b*e^4*E^((4*(1 + a*b*f
*n*Log[F]))/(b^2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(4/n)*Sqrt[Log[F]
])
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int F^{f\left(a+b\ln\left(c\left(ex+d\right)^{n}\right)\right)^{2}}\left(hx+g\right)^{3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)*(h*x+g)^3,x)
```

```
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)*(h*x+g)^3,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(h*x+g)^3,x, algorithm="maxima")
```

```
[Out] integrate((h*x + g)^3*F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

Fricas [A]
time = 0.40, size = 568, normalized size = 1.06

$$-\frac{\left(\sqrt{\pi}\sqrt{-b^2fn^2\log(F)}\,h^3\,\mathrm{erf}\left(\frac{(b^2fn^2\log(xe+d)\log(F)+b^2fn\log(F)\log(c)+abfn\log(F)+2)\sqrt{-b^2fn^2\log(F)}}{b^2fn^2\log(F)}\right)e^{\left(-\frac{4(b^2fn\log(F)\log(c)+abfn\log(F)+1)}{b^2fn^2\log(F)}\right)} - 3\sqrt{\pi}\sqrt{-b^2fn^2\log(F)}\,(dh^3-gh^2e)\,\mathrm{erf}\left(\frac{(2b^2fn^2\log(xe+d)\log(F)+2b^2fn\log(F)\log(c)+2abfn\log(F)+3)\sqrt{-b^2fn^2\log(F)}}{2b^2fn^2\log(F)}\right)e^{\left(-\frac{3(4b^2fn\log(F)\log(c)+4abfn\log(F)+3)}{4b^2fn^2\log(F)}\right)} - \sqrt{\pi}(d^3h^3-3d^2gh^2e+3dg^2he^2-g^3e^3)\sqrt{-b^2fn^2\log(F)}\,\mathrm{erf}\left(\frac{(2b^2fn^2\log(xe+d)\log(F)+2b^2fn\log(F)\log(c)+2abfn\log(F)+1)\sqrt{-b^2fn^2\log(F)}}{2b^2fn^2\log(F)}\right)e^{\left(-\frac{4b^2fn\log(F)\log(c)+4abfn\log(F)+1}{4b^2fn^2\log(F)}\right)} + 3\sqrt{\pi}\sqrt{-b^2fn^2\log(F)}\,(d^2h^3-2dgh^2e+g^2he^2)\,\mathrm{erf}\left(\frac{(b^2fn^2\log(xe+d)\log(F)+b^2fn\log(F)\log(c)+abfn\log(F)+1)\sqrt{-b^2fn^2\log(F)}}{b^2fn^2\log(F)}\right)e^{\left(-\frac{b^2fn\log(F)\log(c)+abfn\log(F)+1}{b^2fn^2\log(F)}\right)}\right)e^{(-4)}}{2bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(h*x+g)^3,x, algorithm="fricas")
```

```
[Out] -1/2*(sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*h^3*erf((b^2*f*n^2*log(x*e + d)*log(
F) + b^2*f*n*log(F)*log(c) + a*b*f*n*log(F) + 2)*sqrt(-b^2*f*n^2*log(F))/(b
^2*f*n^2*log(F)))*e^(-4*(b^2*f*n*log(F)*log(c) + a*b*f*n*log(F) + 1)/(b^2*f
*n^2*log(F))) - 3*sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*(d*h^3 - g*h^2*e)*erf(1/
2*(2*b^2*f*n^2*log(x*e + d)*log(F) + 2*b^2*f*n*log(F)*log(c) + 2*a*b*f*n*lo
g(F) + 3)*sqrt(-b^2*f*n^2*log(F))/(b^2*f*n^2*log(F)))*e^(-3/4*(4*b^2*f*n*lo
g(F)*log(c) + 4*a*b*f*n*log(F) + 3)/(b^2*f*n^2*log(F))) - sqrt(pi)*(d^3*h^3
 - 3*d^2*g*h^2*e + 3*d*g^2*h*e^2 - g^3*e^3)*sqrt(-b^2*f*n^2*log(F))*erf(1/2
*(2*b^2*f*n^2*log(x*e + d)*log(F) + 2*b^2*f*n*log(F)*log(c) + 2*a*b*f*n*log
(F) + 1)*sqrt(-b^2*f*n^2*log(F))/(b^2*f*n^2*log(F)))*e^(-1/4*(4*b^2*f*n*log
(F)*log(c) + 4*a*b*f*n*log(F) + 1)/(b^2*f*n^2*log(F))) + 3*sqrt(pi)*sqrt(-b
^2*f*n^2*log(F))*(d^2*h^3 - 2*d*g*h^2*e + g^2*h*e^2)*erf((b^2*f*n^2*log(x*e
```

```
 + d)*log(F) + b^2*f*n*log(F)*log(c) + a*b*f*n*log(F) + 1)*sqrt(-b^2*f*n^2*
log(F))/(b^2*f*n^2*log(F)))*e^(-(2*b^2*f*n*log(F)*log(c) + 2*a*b*f*n*log(F)
 + 1)/(b^2*f*n^2*log(F))))*e^(-4)/(b*n)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)*(h*x+g)**3,x)
```

```
[Out] Timed out
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(h*x+g)^3,x, algorithm="giac")
```

```
[Out] integrate((h*x + g)^3*F^((b*log((x*e + d)^n*c) + a)^2*f), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{e}^{f\,\ln(F)\,{\left(a+b\,\ln\left(c\,{\left(d+e\,x\right)}^n\right)\right)}^2}\,{\left(g+h\,x\right)}^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)*(g + h*x)^3,x)
```

```
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2)*(g + h*x)^3, x)
```

3.611 $\int F^{f(a+b\log(c(d+ex)^n))^2}(g+hx)^2\,dx$

Optimal. Leaf size=397

$$\frac{e^{-\frac{1+2abfn\log(F)}{b^2fn^2\log(F)}}h(eg-dh)\sqrt{\pi}\,(d+ex)^2\,(c(d+ex)^n)^{-2/n}\operatorname{erfi}\left(\frac{\frac{1}{n}+abf\log(F)+b^2f\log(F)\log(c(d+ex)^n)}{b\sqrt{f}\,\sqrt{\log(F)}}\right)}{be^3\sqrt{f}\,n\sqrt{\log(F)}}+\frac{e^{-\frac{1+4abfn\log(F)}{4b^2fn^2\log(F)}}}{}$$

```
[Out] h*(-d*h+e*g)*(e*x+d)^2*erfi((1/n+a*b*f*ln(F)+b^2*f*ln(F)*ln(c*(e*x+d)^n))/b
/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e^3/exp((1+2*a*b*f*n*ln(F))/b^2/f/n^2/ln(F
))/n/((c*(e*x+d)^n)^(2/n))/f^(1/2)/ln(F)^(1/2)+1/2*(-d*h+e*g)^2*(e*x+d)*erf
i(1/2*(1/n+2*a*b*f*ln(F)+2*b^2*f*ln(F)*ln(c*(e*x+d)^n))/b/f^(1/2)/ln(F)^(1/
2))*Pi^(1/2)/b/e^3/exp(1/4*(1+4*a*b*f*n*ln(F))/b^2/f/n^2/ln(F))/n/((c*(e*x+
d)^n)^(1/n))/f^(1/2)/ln(F)^(1/2)+1/2*h^2*(e*x+d)^3*erfi(1/2*(3/n+2*a*b*f*ln
(F)+2*b^2*f*ln(F)*ln(c*(e*x+d)^n))/b/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e^3/ex
p(3/4*(3+4*a*b*f*n*ln(F))/b^2/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(3/n))/f^(1/2)/
ln(F)^(1/2)
```

Rubi [A]
time = 0.54, antiderivative size = 397, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 6, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.214$, Rules used = {2315, 2312, 2308, 2266, 2235, 2314}

$$\frac{\sqrt{\pi}\,h^2(d+ex)^3\,(c(d+ex)^n)^{-3/n}\exp\left(-\frac{3(4abfn\log(F)+3)}{4b^2fn^2\log(F)}\right)\operatorname{Erfi}\left(\frac{2abf\log(F)+2b^2f\log(F)\log(c(d+ex)^n)+\frac{3}{n}}{2b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be^3\sqrt{f}\,n\sqrt{\log(F)}}+\frac{\sqrt{\pi}\,h(d+ex)^2(eg-dh)\,(c(d+ex)^n)^{-2/n}\,e^{-\frac{2abfn\log(F)+1}{b^2fn^2\log(F)}}\operatorname{Erfi}\left(\frac{abf\log(F)+b^2f\log(F)\log(c(d+ex)^n)+\frac{1}{n}}{b\sqrt{f}\,\sqrt{\log(F)}}\right)}{be^3\sqrt{f}\,n\sqrt{\log(F)}}+\frac{\sqrt{\pi}\,(d+ex)(eg-dh)^2\,(c(d+ex)^n)^{-1/n}\,e^{-\frac{4abfn\log(F)+1}{4b^2fn^2\log(F)}}\operatorname{Erfi}\left(\frac{2abf\log(F)+2b^2f\log(F)\log(c(d+ex)^n)+\frac{1}{n}}{2b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be^3\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(g + h*x)^2,x]
```

```
[Out] (h*(e*g - d*h)*Sqrt[Pi]*(d + e*x)^2*Erfi[(n^(-1) + a*b*f*Log[F] + b^2*f*Log
[F]*Log[c*(d + e*x)^n])/(b*Sqrt[f]*Sqrt[Log[F]])])/(b*e^3*E^((1 + 2*a*b*f*n
*Log[F])/(b^2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(2/n)*Sqrt[Log[F]])
+ ((e*g - d*h)^2*Sqrt[Pi]*(d + e*x)*Erfi[(n^(-1) + 2*a*b*f*Log[F] + 2*b^2*f
*Log[F]*Log[c*(d + e*x)^n])/(2*b*Sqrt[f]*Sqrt[Log[F]])])/(2*b*e^3*E^((1 + 4
*a*b*f*n*Log[F])/(4*b^2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqr
t[Log[F]]) + (h^2*Sqrt[Pi]*(d + e*x)^3*Erfi[(3/n + 2*a*b*f*Log[F] + 2*b^2*f
*Log[F]*Log[c*(d + e*x)^n])/(2*b*Sqrt[f]*Sqrt[Log[F]])])/(2*b*e^3*E^((3*(3
+ 4*a*b*f*n*Log[F]))/(4*b^2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(3/n)*
Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2308

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^(m + 1)/(h*n*(c*(d +
e*x)^n)^((m + 1)/n)), Subst[Int[E^(a*f*Log[F] + ((m + 1)*x)/n + b*f*Log[F]*
x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m
, n}, x] && EqQ[e*g - d*h, 0]
```

Rule 2312

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]*(b_.))^2*(f_.)), x
_Symbol] :> Dist[(c*(d + e*x)^n)^(2*a*b*f*Log[F])/(d + e*x)^(2*a*b*f*n*Log[
F]), Int[(d + e*x)^(2*a*b*f*n*Log[F])*F^(a^2*f + b^2*f*Log[c*(d + e*x)^n]^2
), x], x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] &&  !IntegerQ[2*a*b*f*Log[F
]]
```

Rule 2314

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]*(b_.))^2*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^m*((c*(d + e*x)^n)^(2
*a*b*f*Log[F])/(d + e*x)^(m + 2*a*b*f*n*Log[F])), Int[(d + e*x)^(m + 2*a*b*
f*n*Log[F])*F^(a^2*f + b^2*f*Log[c*(d + e*x)^n]^2), x], x] /; FreeQ[{F, a,
b, c, d, e, f, g, h, m, n}, x] && EqQ[e*g - d*h, 0]
```

Rule 2315

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]*(b_.))^2*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[1/e^(m + 1), Subst[Int[ExpandIn
tegrand[F^(f*(a + b*Log[c*x^n])^2), (e*g - d*h + h*x)^m, x], x], x, d + e*x
], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, n}, x] && IGtQ[m, 0]
```

Rubi steps

$$\int F^{f(a+b\log(c(d+ex)^n))^2}(g+hx)^2\,dx = \int \left(F^{f(a+b\log(c(d+ex)^n))^2}g^2 + 2F^{f(a+b\log(c(d+ex)^n))^2}ghx + F^{f(a+b\log(c(d+ex)^n))^2}\right.$$

$$= g^2\int F^{f(a+b\log(c(d+ex)^n))^2}\,dx + (2gh)\int F^{f(a+b\log(c(d+ex)^n))^2}x\,dx + h^2\int$$

$$= \frac{g^2\text{Subst}\left(\int F^{f(a+b\log(cx^n))^2}\,dx, x, d+ex\right)}{e} + (2gh)\int F^{f(a+b\log(c(d+ex)^n))^2}$$

$$= \frac{g^2\text{Subst}\left(\int F^{a^2f+2abf\log(cx^n)+b^2f\log^2(cx^n)}\,dx, x, d+ex\right)}{e} + (2gh)\int F^{f(a+}$$

$$= \frac{g^2\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}(cx^n)^{2abf\log(F)}\,dx, x, d+ex\right)}{e} + (2gh)\int F^{f}$$

$$= (2gh)\int F^{f(a+b\log(c(d+ex)^n))^2}x\,dx + h^2\int F^{f(a+b\log(c(d+ex)^n))^2}x^2\,dx + \frac{\left(g^2\right.}{}$$

$$= (2gh)\int F^{f(a+b\log(c(d+ex)^n))^2}x\,dx + h^2\int F^{f(a+b\log(c(d+ex)^n))^2}x^2\,dx + \frac{\left(g^2\right.}{}$$

$$= (2gh)\int F^{f(a+b\log(c(d+ex)^n))^2}x\,dx + h^2\int F^{f(a+b\log(c(d+ex)^n))^2}x^2\,dx + \frac{\left(\text{ex}\right.}{}$$

$$= \frac{e^{-\frac{1+4abfn\log(F)}{4b^2fn^2\log(F)}}g^2\sqrt{\pi}\,(d+ex)\,(c(d+ex)^n)^{-1/n}\,\text{erfi}\left(\frac{\frac{1}{n}+2abf\log(F)+2b^2f\log(F}{2b\sqrt{f}\,\sqrt{\log(}}\right.}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Mathematica [A]
time = 0.59, size = 331, normalized size = 0.83

$$\frac{e^{-\frac{3(3+4abfn\log(F))}{4b^2fn^2\log(F)}}\sqrt{\pi}\,(d+ex)\,(c(d+ex)^n)^{-3/n}\left(-2e^{\frac{5+4abfn\log(F)}{4b^2fn^2\log(F)}}h(-eg+dh)(d+ex)\,(c(d+ex)^n)^{\frac{1}{n}}\,\text{erfi}\left(\frac{1+bfn\log(F)(a+b\log(c(d+ex)^n))}{b\sqrt{f}\,n\sqrt{\log(F)}}\right)+e^{\frac{2+2abfn\log(F)}{b^2fn^2\log(F)}}(eg-dh)^2\,(c(d+ex)^n)^{2/n}\,\text{erfi}\left(\frac{1+2bfn\log(F)(a+b\log(c(d+ex)^n))}{2b\sqrt{f}\,n\sqrt{\log(F)}}\right)+h^2(d+ex)^2\text{erfi}\left(\frac{3+2bfn\log(F)(a+b\log(c(d+ex)^n))}{2b\sqrt{f}\,n\sqrt{\log(F)}}\right)\right)}{2be^3\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(g + h*x)^2,x]
```

```
[Out] (Sqrt[Pi]*(d + e*x)*(-2*E^((5 + 4*a*b*f*n*Log[F])/(4*b^2*f*n^2*Log[F]))*h*(
-(e*g) + d*h)*(d + e*x)*(c*(d + e*x)^n)^n^(-1)*Erfi[(1 + b*f*n*Log[F]*(a +
b*Log[c*(d + e*x)^n]))/(b*Sqrt[f]*n*Sqrt[Log[F]])] + E^((2 + 2*a*b*f*n*Log[
F])/(b^2*f*n^2*Log[F]))*(e*g - d*h)^2*(c*(d + e*x)^n)^(2/n)*Erfi[(1 + 2*b*f
*n*Log[F]*(a + b*Log[c*(d + e*x)^n]))/(2*b*Sqrt[f]*n*Sqrt[Log[F]])] + h^2*(
d + e*x)^2*Erfi[(3 + 2*b*f*n*Log[F]*(a + b*Log[c*(d + e*x)^n]))/(2*b*Sqrt[f
]*n*Sqrt[Log[F]])]))/(2*b*e^3*E^((3*(3 + 4*a*b*f*n*Log[F]))/(4*b^2*f*n^2*Lo
g[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(3/n)*Sqrt[Log[F]])
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int F^{f(a+b\ln(c(ex+d)^n))^2}(hx+g)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)*(h*x+g)^2,x)
```

```
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)*(h*x+g)^2,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(h*x+g)^2,x, algorithm="maxima")
```

```
[Out] integrate((h*x + g)^2*F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

Fricas [A]
time = 0.44, size = 410, normalized size = 1.03

$$-\frac{\left(\sqrt{\pi}\sqrt{-b^2fn^2\log(F)}\,h^2\operatorname{erf}\left(\frac{(2b^2fn^2\log(xe+d)\log(F)+2b^2fn\log(F)\log(c)+2abfn\log(F)+3)\sqrt{-b^2fn^2\log(F)}}{2b^2fn^2\log(F)}\right)e^{\left(-\frac{3(4b^2fn\log(F)\log(c)+4abfn\log(F)+3)}{4b^2fn^2\log(F)}\right)}+\sqrt{\pi}\sqrt{-b^2fn^2\log(F)}\,(d^2h^2-2dghe+g^2e^2)\operatorname{erf}\left(\frac{(2b^2fn^2\log(xe+d)\log(F)+2b^2fn\log(F)\log(c)+2abfn\log(F)+1)\sqrt{-b^2fn^2\log(F)}}{2b^2fn^2\log(F)}\right)e^{\left(-\frac{4b^2fn\log(F)\log(c)+4abfn\log(F)+1}{4b^2fn^2\log(F)}\right)}-2\sqrt{\pi}\sqrt{-b^2fn^2\log(F)}\,(dh^2-ghe)\operatorname{erf}\left(\frac{(b^2fn^2\log(xe+d)\log(F)+b^2fn\log(F)\log(c)+abfn\log(F)+1)\sqrt{-b^2fn^2\log(F)}}{b^2fn^2\log(F)}\right)e^{\left(-\frac{2b^2fn\log(F)\log(c)+2abfn\log(F)+1}{b^2fn^2\log(F)}\right)}\right)e^{(-3)}}{2bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(h*x+g)^2,x, algorithm="fricas")
```

```
[Out] -1/2*(sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*h^2*erf(1/2*(2*b^2*f*n^2*log(x*e + d
)*log(F) + 2*b^2*f*n*log(F)*log(c) + 2*a*b*f*n*log(F) + 3)*sqrt(-b^2*f*n^2*
log(F))/(b^2*f*n^2*log(F)))*e^(-3/4*(4*b^2*f*n*log(F)*log(c) + 4*a*b*f*n*lo
g(F) + 3)/(b^2*f*n^2*log(F))) + sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*(d^2*h^2 -
 2*d*g*h*e + g^2*e^2)*erf(1/2*(2*b^2*f*n^2*log(x*e + d)*log(F) + 2*b^2*f*n*
log(F)*log(c) + 2*a*b*f*n*log(F) + 1)*sqrt(-b^2*f*n^2*log(F))/(b^2*f*n^2*lo
g(F)))*e^(-1/4*(4*b^2*f*n*log(F)*log(c) + 4*a*b*f*n*log(F) + 1)/(b^2*f*n^2*
log(F))) - 2*sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*(d*h^2 - g*h*e)*erf((b^2*f*n^
2*log(x*e + d)*log(F) + b^2*f*n*log(F)*log(c) + a*b*f*n*log(F) + 1)*sqrt(-b
^2*f*n^2*log(F))/(b^2*f*n^2*log(F)))*e^(-(2*b^2*f*n*log(F)*log(c) + 2*a*b*f
*n*log(F) + 1)/(b^2*f*n^2*log(F))))*e^(-3)/(b*n)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)*(h*x+g)**2,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(h*x+g)^2,x, algorithm="giac")
```

```
[Out] integrate((h*x + g)^2*F^((b*log((x*e + d)^n*c) + a)^2*f), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int e^{f\ln(F)\left(a+b\ln\left(c\left(d+e\,x\right)^n\right)\right)^2}\left(g+h\,x\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)*(g + h*x)^2,x)
```

```
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2)*(g + h*x)^2, x)
```

3.612 $\int F^{f(a+b\log(c(d+ex)^n))^2}(g+hx)\,dx$

Optimal. Leaf size=257

$$\frac{e^{-\frac{1+2abfn\log(F)}{b^2fn^2\log(F)}}h\sqrt{\pi}\,(d+ex)^2\,(c(d+ex)^n)^{-2/n}\,\mathrm{erfi}\left(\frac{\frac{1}{n}+abf\log(F)+b^2f\log(F)\log(c(d+ex)^n)}{b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be^2\sqrt{f}\,n\sqrt{\log(F)}}+\frac{e^{-\frac{1+4abfn\log(F)}{4b^2fn^2\log(F)}}(eg-dh}{}$$

[Out] 1/2*h*(e*x+d)^2*erfi((1/n+a*b*f*ln(F)+b^2*f*ln(F)*ln(c*(e*x+d)^n))/b/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e^2/exp((1+2*a*b*f*n*ln(F))/b^2/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(2/n))/f^(1/2)/ln(F)^(1/2)+1/2*(-d*h+e*g)*(e*x+d)*erfi(1/2*(1/n+2*a*b*f*ln(F)+2*b^2*f*ln(F)*ln(c*(e*x+d)^n))/b/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e^2/exp(1/4*(1+4*a*b*f*n*ln(F))/b^2/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(1/n))/f^(1/2)/ln(F)^(1/2)

Rubi [A]

time = 0.28, antiderivative size = 257, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$, Rules used = {2315, 2312, 2308, 2266, 2235, 2314}

$$\frac{\sqrt{\pi}\,(d+ex)(eg-dh)\,(c(d+ex)^n)^{-1/n}\,e^{-\frac{4abfn\log(F)+1}{4b^2fn^2\log(F)}}\,\mathrm{Erfi}\left(\frac{2abf\log(F)+2b^2f\log(F)\log(c(d+ex)^n)+\frac{1}{n}}{2b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be^2\sqrt{f}\,n\sqrt{\log(F)}}+\frac{\sqrt{\pi}\,h(d+ex)^2\,(c(d+ex)^n)^{-2/n}\,e^{-\frac{2abfn\log(F)+1}{b^2fn^2\log(F)}}\,\mathrm{Erfi}\left(\frac{abf\log(F)+b^2f\log(F)\log(c(d+ex)^n)+\frac{1}{n}}{b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be^2\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(g + h*x),x]
```

```
[Out] (h*Sqrt[Pi]*(d + e*x)^2*Erfi[(n^(-1) + a*b*f*Log[F] + b^2*f*Log[F]*Log[c*(d + e*x)^n])/(b*Sqrt[f]*Sqrt[Log[F]])])/(2*b*e^2*E^((1 + 2*a*b*f*n*Log[F])/(b^2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(2/n)*Sqrt[Log[F]]) + ((e*g - d*h)*Sqrt[Pi]*(d + e*x)*Erfi[(n^(-1) + 2*a*b*f*Log[F] + 2*b^2*f*Log[F]*Log[c*(d + e*x)^n])/(2*b*Sqrt[f]*Sqrt[Log[F]])])/(2*b*e^2*E^((1 + 4*a*b*f*n*Log[F])/(4*b^2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2308

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^(m + 1)/(h*n*(c*(d +
e*x)^n)^((m + 1)/n)), Subst[Int[E^(a*f*Log[F] + ((m + 1)*x)/n + b*f*Log[F]*
x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m
, n}, x] && EqQ[e*g - d*h, 0]
```

Rule 2312

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]*(b_.))^2*(f_.)), x
_Symbol] :> Dist[(c*(d + e*x)^n)^(2*a*b*f*Log[F])/(d + e*x)^(2*a*b*f*n*Log[
F]), Int[(d + e*x)^(2*a*b*f*n*Log[F])*F^(a^2*f + b^2*f*Log[c*(d + e*x)^n]^2
), x], x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] &&  !IntegerQ[2*a*b*f*Log[F
]]
```

Rule 2314

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]*(b_.))^2*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^m*((c*(d + e*x)^n)^(2
*a*b*f*Log[F])/(d + e*x)^(m + 2*a*b*f*n*Log[F])), Int[(d + e*x)^(m + 2*a*b*
f*n*Log[F])*F^(a^2*f + b^2*f*Log[c*(d + e*x)^n]^2), x], x] /; FreeQ[{F, a,
b, c, d, e, f, g, h, m, n}, x] && EqQ[e*g - d*h, 0]
```

Rule 2315

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]*(b_.))^2*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[1/e^(m + 1), Subst[Int[ExpandIn
tegrand[F^(f*(a + b*Log[c*x^n])^2), (e*g - d*h + h*x)^m, x], x], x, d + e*x
], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, n}, x] && IGtQ[m, 0]
```

Rubi steps

$$\int F^{f(a+b\log(c(d+ex)^n))^2}(g+hx)\,dx = \int \left(F^{f(a+b\log(c(d+ex)^n))^2}g + F^{f(a+b\log(c(d+ex)^n))^2}hx\right)\,dx$$

$$= g\int F^{f(a+b\log(c(d+ex)^n))^2}\,dx + h\int F^{f(a+b\log(c(d+ex)^n))^2}x\,dx$$

$$= \frac{g\text{Subst}\left(\int F^{f(a+b\log(cx^n))^2}\,dx, x, d+ex\right)}{e} + h\int F^{f(a+b\log(c(d+ex)^n))^2}x\,dx$$

$$= \frac{g\text{Subst}\left(\int F^{a^2f+2abf\log(cx^n)+b^2f\log^2(cx^n)}\,dx, x, d+ex\right)}{e} + h\int F^{f(a+b\log(c\cdots}$$

$$= \frac{g\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}(cx^n)^{2abf\log(F)}\,dx, x, d+ex\right)}{e} + h\int F^{f(a+b\log\cdots}$$

$$= h\int F^{f(a+b\log(c(d+ex)^n))^2}x\,dx + \frac{\left(g(d+ex)^{-2abfn\log(F)}\,(c(d+ex)^n)^{2abf\log\cdots}\right.}{\cdots}$$

$$= h\int F^{f(a+b\log(c(d+ex)^n))^2}x\,dx + \frac{\left(g(d+ex)\,(c(d+ex)^n)^{2abf\log(F)-\frac{1+2abfn\cdots}{n}}\right.}{\cdots}$$

$$= h\int F^{f(a+b\log(c(d+ex)^n))^2}x\,dx + \frac{\left(\exp\left(a^2f\log(F)-\frac{(1+2abfn\log(F))^2}{4b^2fn^2\log(F)}\right)g(a\cdots\right.}{\cdots}$$

$$= \frac{e^{-\frac{1+4abfn\log(F)}{4b^2fn^2\log(F)}}g\sqrt{\pi}\,(d+ex)\,(c(d+ex)^n)^{-1/n}\,\text{erfi}\left(\frac{\frac{1}{n}+2abf\log(F)+2b^2f\log(F\cdots}{2b\sqrt{f}\,\sqrt{\log(\cdots}}\right.}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Mathematica [A]
time = 0.32, size = 221, normalized size = 0.86

$$\frac{e^{-\frac{1+2abfn\log(F)}{b^2fn^2\log(F)}}\sqrt{\pi}\,(d+ex)\,(c(d+ex)^n)^{-2/n}\left(h(d+ex)\text{erfi}\left(\frac{1+bfn\log(F)(a+b\log(c(d+ex)^n))}{b\sqrt{f}\,n\sqrt{\log(F)}}\right)+e^{\frac{3+4abfn\log(F)}{4b^2fn^2\log(F)}}(eg-dh)\,(c(d+ex)^n)^{\frac{1}{n}}\,\text{erfi}\left(\frac{1+2bfn\log(F)(a+b\log(c(d+ex)^n))}{2b\sqrt{f}\,n\sqrt{\log(F)}}\right)\right)}{2be^2\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(g + h*x),x]
```

```
[Out] (Sqrt[Pi]*(d + e*x)*(h*(d + e*x)*Erfi[(1 + b*f*n*Log[F]*(a + b*Log[c*(d + e
*x)^n]))/(b*Sqrt[f]*n*Sqrt[Log[F]])] + E^((3 + 4*a*b*f*n*Log[F])/(4*b^2*f*n
^2*Log[F]))*(e*g - d*h)*(c*(d + e*x)^n)^n^(-1)*Erfi[(1 + 2*b*f*n*Log[F]*(a
+ b*Log[c*(d + e*x)^n]))/(2*b*Sqrt[f]*n*Sqrt[Log[F]])]))/(2*b*e^2*E^((1 + 2
*a*b*f*n*Log[F])/(b^2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(2/n)*Sqrt[L
og[F]])
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int F^{f(a+b\ln(c(ex+d)^n))^2}(hx+g)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)*(h*x+g),x)
```

```
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)*(h*x+g),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(h*x+g),x, algorithm="maxima")
```

```
[Out] integrate((h*x + g)*F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

Fricas [A]
time = 0.45, size = 262, normalized size = 1.02

$$\frac{\left(\sqrt{\pi}\sqrt{-b^2fn^2\log\left(F\right)}\left(dh-ge\right)\operatorname{erf}\left(\frac{\left(2\,b^2fn^2\log(xe+d)\log(F)+2\,b^2fn\log(F)\log(c)+2\,abfn\log(F)+1\right)\sqrt{-b^2fn^2\log\left(F\right)}}{2\,b^2fn^2\log(F)}\right)e^{\left(-\frac{4\,b^2fn\log(F)\log(c)+4\,abfn\log(F)+1}{4\,b^2fn^2\log(F)}\right)}-\sqrt{\pi}\sqrt{-b^2fn^2\log\left(F\right)}\,h\operatorname{erf}\left(\frac{\left(b^2fn^2\log(xe+d)\log(F)+b^2fn\log(F)\log(c)+abfn\log(F)+1\right)\sqrt{-b^2fn^2\log\left(F\right)}}{b^2fn^2\log(F)}\right)e^{\left(-\frac{2\,b^2fn\log(F)\log(c)+2\,abfn\log(F)+1}{b^2fn^2\log(F)}\right)}\right)e^{(-2)}}{2\,bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(h*x+g),x, algorithm="fricas")
```

```
[Out] 1/2*(sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*(d*h - g*e)*erf(1/2*(2*b^2*f*n^2*log(
x*e + d)*log(F) + 2*b^2*f*n*log(F)*log(c) + 2*a*b*f*n*log(F) + 1)*sqrt(-b^2
*f*n^2*log(F))/(b^2*f*n^2*log(F)))*e^(-1/4*(4*b^2*f*n*log(F)*log(c) + 4*a*b
*f*n*log(F) + 1)/(b^2*f*n^2*log(F))) - sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*h*e
rf((b^2*f*n^2*log(x*e + d)*log(F) + b^2*f*n*log(F)*log(c) + a*b*f*n*log(F)
+ 1)*sqrt(-b^2*f*n^2*log(F))/(b^2*f*n^2*log(F)))*e^(-(2*b^2*f*n*log(F)*log(
c) + 2*a*b*f*n*log(F) + 1)/(b^2*f*n^2*log(F))))*e^(-2)/(b*n)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)*(h*x+g),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(h*x+g),x, algorithm="giac")
[Out] integrate((h*x + g)*F^((b*log((x*e + d)^n*c) + a)^2*f), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.00

$$\int e^{f\,\ln(F)\,(a+b\,\ln(c\,(d+e\,x)^n))^2}\,(g+h\,x)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)*(g + h*x),x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2)*(g + h*x), x)
```

3.613 $\int F^{f(a+b\log(c(d+ex)^n))^2}\,dx$

Optimal. Leaf size=126

$$\frac{e^{-\frac{1+4abfn\log(F)}{4b^2fn^2\log(F)}}\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}\operatorname{erfi}\left(\frac{\frac{1}{n}+2abf\log(F)+2b^2f\log(F)\log(c(d+ex)^n)}{2b\sqrt{f}\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

```
[Out] 1/2*(e*x+d)*erfi(1/2*(1/n+2*a*b*f*ln(F)+2*b^2*f*ln(F)*ln(c*(e*x+d)^n))/b/f^
(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e/exp(1/4*(1+4*a*b*f*n*ln(F))/b^2/f/n^2/ln(F)
)/n/((c*(e*x+d)^n)^(1/n))/f^(1/2)/ln(F)^(1/2)
```

Rubi [A]
time = 0.08, antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2312, 2308, 2266, 2235}

$$\frac{\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}e^{-\frac{4abfn\log(F)+1}{4b^2fn^2\log(F)}}\operatorname{Erfi}\left(\frac{2abf\log(F)+2b^2f\log(F)\log(c(d+ex)^n)+\frac{1}{n}}{2b\sqrt{f}\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2),x]
```

```
[Out] (Sqrt[Pi]*(d + e*x)*Erfi[(n^(-1) + 2*a*b*f*Log[F] + 2*b^2*f*Log[F]*Log[c*(d
 + e*x)^n])/(2*b*Sqrt[f]*Sqrt[Log[F]])])/(2*b*e*E^((1 + 4*a*b*f*n*Log[F])/(
4*b^2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]])
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2266

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2308

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]^2*(b_.))*(f_.))*((
g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Dist[(g + h*x)^(m + 1)/(h*n*(c*(d +
e*x)^n)^((m + 1)/n)), Subst[Int[E^(a*f*Log[F] + ((m + 1)*x)/n + b*f*Log[F]*
x^2), x], x, Log[c*(d + e*x)^n]], x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m
```

```
, n}, x] && EqQ[e*g - d*h, 0]
```

Rule 2312

```
Int[(F_)^(((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]*(b_.))^2*(f_.)), x
_Symbol] :> Dist[(c*(d + e*x)^n)^(2*a*b*f*Log[F])/(d + e*x)^(2*a*b*f*n*Log[
F]), Int[(d + e*x)^(2*a*b*f*n*Log[F])*F^(a^2*f + b^2*f*Log[c*(d + e*x)^n]^2
), x], x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] &&  !IntegerQ[2*a*b*f*Log[F
]]
```

Rubi steps

$$\int F^{f(a+b\log(c(d+ex)^n))^2}\,dx = \frac{\text{Subst}\left(\int F^{f(a+b\log(cx^n))^2}\,dx, x, d+ex\right)}{e}$$

$$= \frac{\text{Subst}\left(\int F^{a^2f+2abf\log(cx^n)+b^2f\log^2(cx^n)}\,dx, x, d+ex\right)}{e}$$

$$= \frac{\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}(cx^n)^{2abf\log(F)}\,dx, x, d+ex\right)}{e}$$

$$= \frac{\left((d+ex)^{-2abfn\log(F)}\left(c(d+ex)^n\right)^{2abf\log(F)}\right)\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}x^{2abfn\log(F}\right.}{e}$$

$$= \frac{\left((d+ex)\left(c(d+ex)^n\right)^{2abf\log(F)-\frac{1+2abfn\log(F)}{n}}\right)\text{Subst}\left(\int \exp\left(a^2f\log(F)+b^2fx^2\right.\right.}{en}$$

$$= \frac{\left(\exp\left(a^2f\log(F)-\frac{(1+2abfn\log(F))^2}{4b^2fn^2\log(F)}\right)(d+ex)\left(c(d+ex)^n\right)^{2abf\log(F)-\frac{1+2abfn\log(F)}{n}}\right.}{en}$$

$$= \frac{e^{-\frac{1+4abfn\log(F)}{4b^2fn^2\log(F)}}\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}\text{erfi}\left(\frac{\frac{1}{n}+2abf\log(F)+2b^2f\log(F)\log(c(d+ex)}{2b\sqrt{f}\sqrt{\log(F)}}\right.}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Mathematica [A]
time = 0.04, size = 123, normalized size = 0.98

$$\frac{e^{-\frac{1+4abfn\log(F)}{4b^2fn^2\log(F)}}\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}\text{erfi}\left(\frac{1+2bfn\log(F)(a+b\log(c(d+ex)^n))}{2b\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2),x]
```

```
[Out] (Sqrt[Pi]*(d + e*x)*Erfi[(1 + 2*b*f*n*Log[F]*(a + b*Log[c*(d + e*x)^n]))/(2
*b*Sqrt[f]*n*Sqrt[Log[F]])])/(2*b*e*E^((1 + 4*a*b*f*n*Log[F])/(4*b^2*f*n^2*
Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]])
```

Maple [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{f(a+b\ln(c(ex+d)^n))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2),x)
```

```
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2),x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2),x, algorithm="maxima")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

Fricas [A]
time = 0.45, size = 131, normalized size = 1.04

$$-\frac{\sqrt{\pi}\,\sqrt{-b^2fn^2\log\left(F\right)}\,\operatorname{erf}\left(\frac{\left(2\,b^2fn^2\log(xe+d)\log(F)+2\,b^2fn\log(F)\log(c)+2\,abfn\log(F)+1\right)\sqrt{-b^2fn^2\log\left(F\right)}}{2\,b^2fn^2\log(F)}\right)e^{\left(-\frac{4\,b^2fn\log(F)\log(c)+4\,abfn\log(F)+1}{4\,b^2fn^2\log(F)}-1\right)}}{2\,bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*erf(1/2*(2*b^2*f*n^2*log(x*e + d)*log
(F) + 2*b^2*f*n*log(F)*log(c) + 2*a*b*f*n*log(F) + 1)*sqrt(-b^2*f*n^2*log(F
))/(b^2*f*n^2*log(F)))*e^(-1/4*(4*b^2*f*n*log(F)*log(c) + 4*a*b*f*n*log(F)
+ 1)/(b^2*f*n^2*log(F)) - 1)/(b*n)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int F^{f(a+b\log\left(c(d+ex)^n\right))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2),x)
[Out] Integral(F**(f*(a + b*log(c*(d + e*x)**n))**2), x)
```

Giac [A]
time = 3.18, size = 116, normalized size = 0.92

$$-\frac{\sqrt{\pi}\,\operatorname{erf}\left(-\sqrt{-f\log\left(F\right)}\,bn\log\left(xe+d\right)-\sqrt{-f\log\left(F\right)}\,b\log\left(c\right)-\sqrt{-f\log\left(F\right)}\,a-\frac{\sqrt{-f\log\left(F\right)}}{2\,bfn\log\left(F\right)}\right)e^{\left(-\frac{a}{bn}-\frac{1}{4\,b^{2}fn^{2}\log\left(F\right)}-1\right)}}{2\,\sqrt{-f\log\left(F\right)}\,bc^{\left(\frac{1}{n}\right)}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2),x, algorithm="giac")
[Out] -1/2*sqrt(pi)*erf(-sqrt(-f*log(F))*b*n*log(x*e + d) - sqrt(-f*log(F))*b*log
(c) - sqrt(-f*log(F))*a - 1/2*sqrt(-f*log(F))/(b*f*n*log(F)))*e^(-a/(b*n) -
 1/4/(b^2*f*n^2*log(F)) - 1)/(sqrt(-f*log(F))*b*c^(1/n)*n)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{e}^{f\,\ln(F)\,\left(a+b\,\ln\left(c\,{(d+e\,x)}^n\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2),x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2), x)
```

3.614 $\int \frac{F^{f(a+b\log(c(d+ex)^n))^2}}{g+hx}\,dx$

Optimal. Leaf size=31

$$\operatorname{Int}\left(\frac{F^{f(a+b\log(c(d+ex)^n))^2}}{g+hx},x\right)$$

```
[Out] Unintegrable(F^(f*(a+b*ln(c*(e*x+d)^n))^2)/(h*x+g),x)
```

Rubi [A]
time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{F^{f(a+b\log(c(d+ex)^n))^2}}{g+hx}\,dx$$

Verification is not applicable to the result.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(g + h*x),x]
[Out] Defer[Int][F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(g + h*x), x]
```

Rubi steps

$$\int \frac{F^{f(a+b\log(c(d+ex)^n))^2}}{g+hx}\,dx = \int \frac{F^{f(a+b\log(c(d+ex)^n))^2}}{g+hx}\,dx$$

Mathematica [A]
time = 0.98, size = 0, normalized size = 0.00

$$\int \frac{F^{f(a+b\log(c(d+ex)^n))^2}}{g+hx}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(g + h*x),x]
[Out] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(g + h*x), x]
```

Maple [A]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{F^{f(a+b\ln(c(ex+d)^n))^2}}{hx+g}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)/(h*x+g),x)
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)/(h*x+g),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(h*x+g),x, algorithm="maxima")
[Out] integrate(F^((b*log((e*x + d)^n*c) + a)^2*f)/(h*x + g), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(h*x+g),x, algorithm="fricas")
[Out] integral(F^(b^2*f*log((x*e + d)^n*c)^2 + 2*a*b*f*log((x*e + d)^n*c) + a^2*f
)/(h*x + g), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{f(a+b\log(c(d+ex)^n))^2}}{g+hx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)/(h*x+g),x)
[Out] Integral(F**(f*(a + b*log(c*(d + e*x)**n))**2)/(g + h*x), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(h*x+g),x, algorithm="giac")
[Out] integrate(F^((b*log((x*e + d)^n*c) + a)^2*f)/(h*x + g), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{e^{f \ln(F) (a+b \ln(c (d+e x)^n))^2}}{g + h x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)/(g + h*x),x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2)/(g + h*x), x)
```

3.615 $\int \frac{F^{f(a+b\log(c(d+ex)^n))^2}}{(g+hx)^2} dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{F^{f(a+b\log(c(d+ex)^n))^2}}{(g+hx)^2},x\right)$$

[Out] Unintegrable(F^(f*(a+b*ln(c*(e*x+d)^n))^2)/(h*x+g)^2,x)

Rubi [A]
time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{F^{f(a+b\log(c(d+ex)^n))^2}}{(g+hx)^2} dx$$

Verification is not applicable to the result.

[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(g + h*x)^2,x]

[Out] Defer[Int][F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(g + h*x)^2, x]

Rubi steps

$$\int \frac{F^{f(a+b\log(c(d+ex)^n))^2}}{(g+hx)^2} dx = \int \frac{F^{f(a+b\log(c(d+ex)^n))^2}}{(g+hx)^2} dx$$

Mathematica [A]
time = 3.44, size = 0, normalized size = 0.00

$$\int \frac{F^{f(a+b\log(c(d+ex)^n))^2}}{(g+hx)^2} dx$$

Verification is not applicable to the result.

[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(g + h*x)^2,x]

[Out] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(g + h*x)^2, x]

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{F^{f(a+b\ln(c(ex+d)^n))^2}}{(hx+g)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)/(h*x+g)^2,x)
```

```
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)/(h*x+g)^2,x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(h*x+g)^2,x, algorithm="maxima")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c) + a)^2*f)/(h*x + g)^2, x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(h*x+g)^2,x, algorithm="fricas")
```

```
[Out] integral(F^(b^2*f*log((x*e + d)^n*c)^2 + 2*a*b*f*log((x*e + d)^n*c) + a^2*f
)/(h^2*x^2 + 2*g*h*x + g^2), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)/(h*x+g)**2,x)
```

```
[Out] Timed out
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(h*x+g)^2,x, algorithm="giac")
```

```
[Out] integrate(F^((b*log((x*e + d)^n*c) + a)^2*f)/(h*x + g)^2, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{e^{f\ln(F)\,(a+b\ln(c\,(d+e\,x)^n))^2}}{(g+h\,x)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)/(g + h*x)^2,x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2)/(g + h*x)^2, x)
```

3.616 $\int \frac{F^{f(a+b\log(c(d+ex)^n))^2}}{(g+hx)^3}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{F^{f(a+b\log(c(d+ex)^n))^2}}{(g+hx)^3},x\right)$$

```
[Out] Unintegrable(F^(f*(a+b*ln(c*(e*x+d)^n))^2)/(h*x+g)^3,x)
```

Rubi [A]
time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{F^{f(a+b\log(c(d+ex)^n))^2}}{(g+hx)^3}\,dx$$

Verification is not applicable to the result.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(g + h*x)^3,x]
[Out] Defer[Int][F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(g + h*x)^3, x]
```

Rubi steps

$$\int \frac{F^{f(a+b\log(c(d+ex)^n))^2}}{(g+hx)^3}\,dx = \int \frac{F^{f(a+b\log(c(d+ex)^n))^2}}{(g+hx)^3}\,dx$$

Mathematica [A]
time = 5.02, size = 0, normalized size = 0.00

$$\int \frac{F^{f(a+b\log(c(d+ex)^n))^2}}{(g+hx)^3}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(g + h*x)^3,x]
[Out] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(g + h*x)^3, x]
```

Maple [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{F^{f(a+b\ln(c(ex+d)^n))^2}}{(hx+g)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)/(h*x+g)^3,x)
```

```
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)/(h*x+g)^3,x)
```

Maxima [**A**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(h*x+g)^3,x, algorithm="maxima")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c) + a)^2*f)/(h*x + g)^3, x)
```

Fricas [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(h*x+g)^3,x, algorithm="fricas")
```

```
[Out] integral(F^(b^2*f*log((x*e + d)^n*c)^2 + 2*a*b*f*log((x*e + d)^n*c) + a^2*f
)/(h^3*x^3 + 3*g*h^2*x^2 + 3*g^2*h*x + g^3), x)
```

Sympy [**F(-1)**] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)/(h*x+g)**3,x)
```

```
[Out] Timed out
```

Giac [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(h*x+g)^3,x, algorithm="giac")
```

```
[Out] integrate(F^((b*log((x*e + d)^n*c) + a)^2*f)/(h*x + g)^3, x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{e^{f\,\ln(F)\,(a+b\,\ln(c\,(d+e\,x)^n))^2}}{(g+h\,x)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)/(g + h*x)^3,x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2)/(g + h*x)^3, x)
```

3.617 $\int F^{a+bx+cx^3}(b+3cx^2)\,dx$

Optimal. Leaf size=17

$$\frac{F^{a+bx+cx^3}}{\log(F)}$$

```
[Out] F^(c*x^3+b*x+a)/ln(F)
```

Rubi [A]
time = 0.04, antiderivative size = 17, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$, Rules used = {6838}

$$\frac{F^{a+bx+cx^3}}{\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*x + c*x^3)*(b + 3*c*x^2),x]
```

```
[Out] F^(a + b*x + c*x^3)/Log[F]
```

Rule 6838

```
Int[(F_)^(v_)*(u_), x_Symbol] :> With[{q = DerivativeDivides[v, u, x]}, Sim
p[q*(F^v/Log[F]), x] /;  !FalseQ[q]] /; FreeQ[F, x]
```

Rubi steps

$$\int F^{a+bx+cx^3}\left(b+3cx^2\right)\,dx=\frac{F^{a+bx+cx^3}}{\log(F)}$$

Mathematica [A]
time = 0.05, size = 17, normalized size = 1.00

$$\frac{F^{a+bx+cx^3}}{\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*x + c*x^3)*(b + 3*c*x^2),x]
```

```
[Out] F^(a + b*x + c*x^3)/Log[F]
```

Maple [A]
time = 0.02, size = 18, normalized size = 1.06

method	result	size
gosper	$\frac{F^{c\,x^3+bx+a}}{\ln(F)}$	18
derivativedivides	$\frac{F^{c\,x^3+bx+a}}{\ln(F)}$	18
default	$\frac{F^{c\,x^3+bx+a}}{\ln(F)}$	18
risch	$\frac{F^{c\,x^3+bx+a}}{\ln(F)}$	18
norman	$\frac{e^{\left(c\,x^3+bx+a\right)\ln(F)}}{\ln(F)}$	20

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(c*x^3+b*x+a)*(3*c*x^2+b),x,method=_RETURNVERBOSE)
```

```
[Out] F^(c*x^3+b*x+a)/ln(F)
```

Maxima [A]
time = 0.29, size = 17, normalized size = 1.00

$$\frac{F^{cx^3+bx+a}}{\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(c*x^3+b*x+a)*(3*c*x^2+b),x, algorithm="maxima")
```

```
[Out] F^(c*x^3 + b*x + a)/log(F)
```

Fricas [A]
time = 0.45, size = 17, normalized size = 1.00

$$\frac{F^{cx^3+bx+a}}{\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(c*x^3+b*x+a)*(3*c*x^2+b),x, algorithm="fricas")
```

```
[Out] F^(c*x^3 + b*x + a)/log(F)
```

Sympy [A]
time = 0.04, size = 24, normalized size = 1.41

$$\begin{cases} \frac{F^{a+bx+cx^3}}{\log(F)} & \text{for}\ \log(F) \neq 0 \\ bx + cx^3 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(c*x**3+b*x+a)*(3*c*x**2+b),x)
```

```
[Out] Piecewise((F**(a + b*x + c*x**3)/log(F), Ne(log(F), 0)), (b*x + c*x**3, Tru
e))
```

Giac [A]
time = 1.99, size = 17, normalized size = 1.00

$$\frac{F^{cx^3+bx+a}}{\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(c*x^3+b*x+a)*(3*c*x^2+b),x, algorithm="giac")
```

```
[Out] F^(c*x^3 + b*x + a)/log(F)
```

Mupad [B]
time = 3.68, size = 17, normalized size = 1.00

$$\frac{F^{c\,x^3+b\,x+a}}{\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*x + c*x^3)*(b + 3*c*x^2),x)
```

```
[Out] F^(a + b*x + c*x^3)/log(F)
```

3.618 $\int \frac{F^{\frac{1}{a+bx+cx^2}}(b+2cx)}{(a+bx+cx^2)^2} dx$

Optimal. Leaf size=20

$$-\frac{F^{\frac{1}{a+bx+cx^2}}}{\log(F)}$$

```
[Out] -F^(1/(c*x^2+b*x+a))/ln(F)
```

Rubi [A]
time = 0.12, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.030$, Rules used = {6838}

$$-\frac{F^{\frac{1}{a+bx+cx^2}}}{\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[(F^(a + b*x + c*x^2)^(-1)*(b + 2*c*x))/(a + b*x + c*x^2)^2,x]
[Out] -(F^(a + b*x + c*x^2)^(-1)/Log[F])
```

Rule 6838

```
Int[(F_)^(v_)*(u_), x_Symbol] :> With[{q = DerivativeDivides[v, u, x]}, Sim
p[q*(F^v/Log[F]), x] /;  !FalseQ[q]] /; FreeQ[F, x]
```

Rubi steps

$$\int \frac{F^{\frac{1}{a+bx+cx^2}}(b+2cx)}{(a+bx+cx^2)^2} dx = -\frac{F^{\frac{1}{a+bx+cx^2}}}{\log(F)}$$

Mathematica [A]
time = 0.04, size = 19, normalized size = 0.95

$$-\frac{F^{\frac{1}{a+x(b+cx)}}}{\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(F^(a + b*x + c*x^2)^(-1)*(b + 2*c*x))/(a + b*x + c*x^2)^2,x]
[Out] -(F^(a + x*(b + c*x))^(-1)/Log[F])
```

Maple [A]
time = 0.15, size = 21, normalized size = 1.05

method	result	size
derivativedivides	$-\frac{F^{\frac{1}{c\,x^{2}+b x+a}}}{\ln\left(F\right)}$	21
default	$-\frac{F^{\frac{1}{c\,x^{2}+b x+a}}}{\ln\left(F\right)}$	21
risch	$-\frac{F^{\frac{1}{c\,x^{2}+b x+a}}}{\ln\left(F\right)}$	21
norman	$\frac{-\frac{a\,{\mathrm e}^{\frac{\ln\left(F\right)}{c\,x^{2}+b x+a}}}{\ln\left(F\right)}-\frac{b x\,{\mathrm e}^{\frac{\ln\left(F\right)}{c\,x^{2}+b x+a}}}{\ln\left(F\right)}-\frac{c\,x^{2}{\mathrm e}^{\frac{\ln\left(F\right)}{c\,x^{2}+b x+a}}}{\ln\left(F\right)}}{c\,x^{2}+b x+a}$	88

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(1/(c*x^2+b*x+a))*(2*c*x+b)/(c*x^2+b*x+a)^2,x,method=_RETURNVERBOSE)
[Out] -F^(1/(c*x^2+b*x+a))/ln(F)
```

Maxima [A]
time = 0.29, size = 20, normalized size = 1.00

$$-\frac{F^{\left(\frac{1}{cx^{2}+bx+a}\right)}}{\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(1/(c*x^2+b*x+a))*(2*c*x+b)/(c*x^2+b*x+a)^2,x, algorithm="maxim
a")
[Out] -F^(1/(c*x^2 + b*x + a))/log(F)
```

Fricas [A]
time = 0.38, size = 20, normalized size = 1.00

$$-\frac{F^{\left(\frac{1}{cx^{2}+bx+a}\right)}}{\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(1/(c*x^2+b*x+a))*(2*c*x+b)/(c*x^2+b*x+a)^2,x, algorithm="frica
s")
[Out] -F^(1/(c*x^2 + b*x + a))/log(F)
```

Sympy [A]
time = 0.26, size = 32, normalized size = 1.60

$$\begin{cases} -\frac{F^{\frac{1}{a+bx+cx^{2}}}}{\log\left(F\right)} & \text{for}\ \log\left(F\right) \neq 0 \\ -\frac{1}{a+bx+cx^{2}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(1/(c*x**2+b*x+a))*(2*c*x+b)/(c*x**2+b*x+a)**2,x)
```

```
[Out] Piecewise((-F**(1/(a + b*x + c*x**2))/log(F), Ne(log(F), 0)), (-1/(a + b*x
+ c*x**2), True))
```

Giac [A]
time = 3.18, size = 20, normalized size = 1.00

$$-\frac{F^{\left(\frac{1}{cx^2+bx+a}\right)}}{\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(1/(c*x^2+b*x+a))*(2*c*x+b)/(c*x^2+b*x+a)^2,x, algorithm="giac"
)
```

```
[Out] -F^(1/(c*x^2 + b*x + a))/log(F)
```

Mupad [B]
time = 4.00, size = 20, normalized size = 1.00

$$-\frac{F^{\frac{1}{c\,x^2+b\,x+a}}}{\ln\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((F^(1/(a + b*x + c*x^2))*(b + 2*c*x))/(a + b*x + c*x^2)^2,x)
```

```
[Out] -F^(1/(a + b*x + c*x^2))/log(F)
```

3.619 $\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)^m dx$

Optimal. Leaf size=49

$$\left(-a-bx-cx^2\right)^{-m}\left(a+bx+cx^2\right)^m\Gamma\left(1+m,-a-bx-cx^2\right)$$

```
[Out] (c*x^2+b*x+a)^m*GAMMA(1+m,-c*x^2-b*x-a)/((-c*x^2-b*x-a)^m)
```

Rubi [A]
time = 0.14, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.065$, Rules used = {6839, 2212}

$$\left(-a-bx-cx^2\right)^{-m}\left(a+bx+cx^2\right)^m\text{Gamma}\left(m+1,-a-bx-cx^2\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^m,x]
```

```
[Out] ((a + b*x + c*x^2)^m*Gamma[1 + m, -a - b*x - c*x^2])/(-a - b*x - c*x^2)^m
```

Rule 2212

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

Rule 6839

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\begin{aligned}\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)^m dx &= \text{Subst}\left(\int e^x x^m\,dx,x,a+bx+cx^2\right)\\ &= \left(-a-bx-cx^2\right)^{-m}\left(a+bx+cx^2\right)^m\Gamma\left(1+m,-a-bx-cx^2\right)\end{aligned}$$

Mathematica [A]
time = 0.11, size = 44, normalized size = 0.90

$$(-a-x(b+cx))^{-m}(a+x(b+cx))^m\Gamma(1+m,-a-x(b+cx))$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^m,x]
[Out] ((a + x*(b + c*x))^m*Gamma[1 + m, -a - x*(b + c*x)])/(-a - x*(b + c*x))^m
```

Maple [F]
time = 0.08, size = 0, normalized size = 0.00

$$\int e^{c\,x^{2}+b x +a} \left(2 c x +b \right) \left(c\,x^{2}+b x +a \right)^{m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^m,x)
[Out] int(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^m,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^m,x, algorithm="maxima")
[Out] integrate((2*c*x + b)*(c*x^2 + b*x + a)^m*e^(c*x^2 + b*x + a), x)
```

Fricas [A]
time = 0.10, size = 23, normalized size = 0.47

$$\cos\left(\pi m\right)\Gamma\left(m+1,-cx^{2}-bx-a\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^m,x, algorithm="fricas")
[Out] cos(pi*m)*gamma(m + 1, -c*x^2 - b*x - a)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)*(c*x**2+b*x+a)**m,x)
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^m,x, algorithm="giac")
```

```
[Out] integrate((2*c*x + b)*(c*x^2 + b*x + a)^m*e^(c*x^2 + b*x + a), x)
```

Mupad [B]
time = 3.69, size = 49, normalized size = 1.00

$$\frac{\Gamma(m+1,-c\,x^2-b\,x-a)\,\left(c\,x^2+b\,x+a\right)^m}{\left(-c\,x^2-b\,x-a\right)^m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^m,x)
```

```
[Out] (igamma(m + 1, - a - b*x - c*x^2)*(a + b*x + c*x^2)^m)/(- a - b*x - c*x^2)^
m
```

3.620 $\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)^3\,dx$

Optimal. Leaf size=90

$$-6e^{a+bx+cx^2}+6e^{a+bx+cx^2}\left(a+bx+cx^2\right)-3e^{a+bx+cx^2}\left(a+bx+cx^2\right)^2+e^{a+bx+cx^2}\left(a+bx+cx^2\right)^3$$

```
[Out] -6*exp(c*x^2+b*x+a)+6*exp(c*x^2+b*x+a)*(c*x^2+b*x+a)-3*exp(c*x^2+b*x+a)*(c*
x^2+b*x+a)^2+exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^3
```

Rubi [A]
time = 0.13, antiderivative size = 90, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {6839, 2207, 2225}

$$e^{a+bx+cx^2}\left(a+bx+cx^2\right)^3-3e^{a+bx+cx^2}\left(a+bx+cx^2\right)^2+6e^{a+bx+cx^2}\left(a+bx+cx^2\right)-6e^{a+bx+cx^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^3,x]
```

```
[Out] -6*E^(a + b*x + c*x^2) + 6*E^(a + b*x + c*x^2)*(a + b*x + c*x^2) - 3*E^(a +
 b*x + c*x^2)*(a + b*x + c*x^2)^2 + E^(a + b*x + c*x^2)*(a + b*x + c*x^2)^3
```

Rule 2207

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[(c + d*x)^m*((b*F^(g*(e + f*x)))^n/(f*g*n*Log[F])),
x] - Dist[d*(m/(f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !TrueQ[$UseGamma]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 6839

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)^3\,dx = \text{Subst}\left(\int e^x x^3\,dx, x, a+bx+cx^2\right)$$
$$= e^{a+bx+cx^2}\left(a+bx+cx^2\right)^3 - 3\text{Subst}\left(\int e^x x^2\,dx, x, a+bx+cx^2\right.$$
$$= -3e^{a+bx+cx^2}\left(a+bx+cx^2\right)^2 + e^{a+bx+cx^2}\left(a+bx+cx^2\right)^3 + 6\text{Sub}$$
$$= 6e^{a+bx+cx^2}\left(a+bx+cx^2\right) - 3e^{a+bx+cx^2}\left(a+bx+cx^2\right)^2 + e^{a+bx+}$$
$$= -6e^{a+bx+cx^2} + 6e^{a+bx+cx^2}\left(a+bx+cx^2\right) - 3e^{a+bx+cx^2}\left(a+bx+\right.$$

Mathematica [A]
time = 0.11, size = 49, normalized size = 0.54

$$e^{a+x(b+cx)}\left(-6+6(a+x(b+cx))-3(a+x(b+cx))^2+(a+x(b+cx))^3\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^3,x]
[Out] E^(a + x*(b + c*x))*(-6 + 6*(a + x*(b + c*x)) - 3*(a + x*(b + c*x))^2 + (a
+ x*(b + c*x))^3)
```

Maple [A]
time = 0.12, size = 87, normalized size = 0.97

method	result
derivativedivides	$-6\,e^{c\,x^2+bx+a}+6\,e^{c\,x^2+bx+a}(c\,x^2+bx+a)-3\,e^{c\,x^2+bx+a}(c\,x^2+bx+a)^2+e^{c\,x^2+bx+a}(c\,x$
default	$-6\,e^{c\,x^2+bx+a}+6\,e^{c\,x^2+bx+a}(c\,x^2+bx+a)-3\,e^{c\,x^2+bx+a}(c\,x^2+bx+a)^2+e^{c\,x^2+bx+a}(c\,x$
gosper	$(c^3x^6+3b\,c^2x^5+3a\,c^2x^4+3b^2c\,x^4+6abc\,x^3+b^3x^3-3c^2x^4+3a^2c\,x^2+3a\,b^2x^2-6bc$
risch	$(c^3x^6+3b\,c^2x^5+3a\,c^2x^4+3b^2c\,x^4+6abc\,x^3+b^3x^3-3c^2x^4+3a^2c\,x^2+3a\,b^2x^2-6bc$
norman	$(a^3-3a^2+6a-6)\,e^{c\,x^2+bx+a}+c^3x^6e^{c\,x^2+bx+a}+(3c^2a+3c\,b^2-3c^2)\,x^4e^{c\,x^2+bx+a}+(3a$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^3,x,method=_RETURNVERBOSE)
[Out] -6*exp(c*x^2+b*x+a)+6*exp(c*x^2+b*x+a)*(c*x^2+b*x+a)-3*exp(c*x^2+b*x+a)*(c*
x^2+b*x+a)^2+exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^3
```

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 0.86, size = 2381, normalized size = 26.46

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^3,x, algorithm="maxima")

[Out] 1/2*sqrt(pi)*a^3*b*erf(sqrt(-c)*x - 1/2*b/sqrt(-c))*e^(a - 1/4*b^2/c)/sqrt(-c) - 3/4*(sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(3/2)) - 2*e^(1/4*(2*c*x + b)^2/c)/sqrt(c))*a^2*b^2*e^(a - 1/4*b^2/c)/sqrt(c) + 3/8*(sqrt(pi)*(2*c*x + b)*b^2*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(5/2)) - 4*b*e^(1/4*(2*c*x + b)^2/c)/c^(3/2) - 4*(2*c*x + b)^3*gamma(3/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(5/2)))*a*b^3*e^(a - 1/4*b^2/c)/sqrt(c) - 1/16*(sqrt(pi)*(2*c*x + b)*b^3*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(7/2)) - 6*b^2*e^(1/4*(2*c*x + b)^2/c)/c^(5/2) - 12*(2*c*x + b)^3*b*gamma(3/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(7/2)) + 8*gamma(2, -1/4*(2*c*x + b)^2/c)/c^(3/2))*b^4*e^(a - 1/4*b^2/c)/sqrt(c) - 1/2*(sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(3/2)) - 2*e^(1/4*(2*c*x + b)^2/c)/sqrt(c))*a^3*sqrt(c)*e^(a - 1/4*b^2/c) + 9/8*(sqrt(pi)*(2*c*x + b)*b^2*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(5/2)) - 4*b*e^(1/4*(2*c*x + b)^2/c)/c^(3/2) - 4*(2*c*x + b)^3*gamma(3/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(5/2)))*a^2*b*sqrt(c)*e^(a - 1/4*b^2/c) - 3/4*(sqrt(pi)*(2*c*x + b)*b^3*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(7/2)) - 6*b^2*e^(1/4*(2*c*x + b)^2/c)/c^(5/2) - 12*(2*c*x + b)^3*b*gamma(3/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(7/2)) + 8*gamma(2, -1/4*(2*c*x + b)^2/c)/c^(3/2))*a*b^2*sqrt(c)*e^(a - 1/4*b^2/c) + 5/32*(sqrt(pi)*(2*c*x + b)*b^4*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(9/2)) - 8*b^3*e^(1/4*(2*c*x + b)^2/c)/c^(7/2) - 24*(2*c*x + b)^3*b^2*gamma(3/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(9/2)) + 32*b*gamma(2, -1/4*(2*c*x + b)^2/c)/c^(5/2) - 16*(2*c*x + b)^5*gamma(5/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(5/2)*c^(9/2)))*b^3*sqrt(c)*e^(a - 1/4*b^2/c) - 3/8*(sqrt(pi)*(2*c*x + b)*b^3*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(7/2)) - 6*b^2*e^(1/4*(2*c*x + b)^2/c)/c^(5/2) - 12*(2*c*x + b)^3*b*gamma(3/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(7/2)) + 8*gamma(2, -1/4*(2*c*x + b)^2/c)/c^(3/2))*a^2*c^(3/2)*e^(a - 1/4*b^2/c) + 15/32*(sqrt(pi)*(2*c*x + b)*b^4*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(9/2)) - 8*b^3*e^(1/4*(2*c*x + b)^2/c)/c^(7/2) - 24*(2*c*x + b)^3*b^2*gamma(3/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(9/2)) + 32*b*gamma(2, -1/4*(2*c*x + b)^2/c)/c^(5/2) - 16*(2*c*x + b)^5*gamma(5/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(5/2)*c^(9/2)))*a*b*c^(3/2)*e^(a - 1/4*b^2/c) - 9/64*(sqrt(pi)*(2*c*x + b)*b^5*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(11/2)) - 10*b^4*e^(1/4*(2*c*x + b)^2/c)/c^(9/2) - 40*(2*c*x + b)^3*b^3*gamma(3/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(11/2)) + 80*b^2*gamma(2, -1/4*(2*c*x + b)^2/c)/c^(7/2) - 80*(2*c*x + b)^5*b*gamma(5/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(5/2)*c^(11/2)) - 32*gamma(3, -1/4*(2*c*x + b)^2/c)/c^(5

```
/2))*b^2*c^(3/2)*e^(a - 1/4*b^2/c) - 3/32*(sqrt(pi)*(2*c*x + b)*b^5*(erf(1/
2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(11/2)) - 10*b^4*e
^(1/4*(2*c*x + b)^2/c)/c^(9/2) - 40*(2*c*x + b)^3*b^3*gamma(3/2, -1/4*(2*c*
x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(11/2)) + 80*b^2*gamma(2, -1/4*(2*c
*x + b)^2/c)/c^(7/2) - 80*(2*c*x + b)^5*b*gamma(5/2, -1/4*(2*c*x + b)^2/c)/
((-(2*c*x + b)^2/c)^(5/2)*c^(11/2)) - 32*gamma(3, -1/4*(2*c*x + b)^2/c)/c^(
5/2))*a*c^(5/2)*e^(a - 1/4*b^2/c) + 7/128*(sqrt(pi)*(2*c*x + b)*b^6*(erf(1/
2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(13/2)) - 12*b^5*e
^(1/4*(2*c*x + b)^2/c)/c^(11/2) - 60*(2*c*x + b)^3*b^4*gamma(3/2, -1/4*(2*c
*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(13/2)) + 160*b^3*gamma(2, -1/4*(2
*c*x + b)^2/c)/c^(9/2) - 240*(2*c*x + b)^5*b^2*gamma(5/2, -1/4*(2*c*x + b)^
2/c)/((-(2*c*x + b)^2/c)^(5/2)*c^(13/2)) - 192*b*gamma(3, -1/4*(2*c*x + b)^
2/c)/c^(7/2) - 64*(2*c*x + b)^7*gamma(7/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x
+ b)^2/c)^(7/2)*c^(13/2)))*b*c^(5/2)*e^(a - 1/4*b^2/c) - 1/128*(sqrt(pi)*(2
*c*x + b)*b^7*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)
*c^(15/2)) - 14*b^6*e^(1/4*(2*c*x + b)^2/c)/c^(13/2) - 84*(2*c*x + b)^3*b^5
*gamma(3/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(15/2)) + 280
*b^4*gamma(2, -1/4*(2*c*x + b)^2/c)/c^(11/2) - 560*(2*c*x + b)^5*b^3*gamma(
5/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(5/2)*c^(15/2)) - 672*b^2*ga
mma(3, -1/4*(2*c*x + b)^2/c)/c^(9/2) - 448*(2*c*x + b)^7*b*gamma(7/2, -1/4*
(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(7/2)*c^(15/2)) + 128*gamma(4, -1/4*(2
*c*x + b)^2/c)/c^(7/2))*c^(7/2)*e^(a - 1/4*b^2/c)
```

Fricas [A]
time = 0.37, size = 109, normalized size = 1.21

$$\left(c^3x^6+3\,bc^2x^5+3\,\left(b^2c+(a-1)c^2\right)x^4+\left(b^3+6\,(a-1)bc\right)x^3+a^3+3\,\left(a^2-2\,a+2\right)bx+3\,\left((a-1)b^2+\left(a^2-2\,a+2\right)c\right)x^2-3\,a^2+6\,a-6\right)e^{\left(cx^2+bx+a\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^3,x, algorithm="fricas")
```

```
[Out] (c^3*x^6 + 3*b*c^2*x^5 + 3*(b^2*c + (a - 1)*c^2)*x^4 + (b^3 + 6*(a - 1)*b*c
)*x^3 + a^3 + 3*(a^2 - 2*a + 2)*b*x + 3*((a - 1)*b^2 + (a^2 - 2*a + 2)*c)*x
^2 - 3*a^2 + 6*a - 6)*e^(c*x^2 + b*x + a)
```

Sympy [A]
time = 0.12, size = 160, normalized size = 1.78

$$\left(a^3+3a^2bx+3a^2cx^2-3a^2+3ab^2x^2+6abcx^3-6abx+3ac^2x^4-6acx^2+6a+b^3x^3+3b^2cx^4-3b^2x^2+3bc^2x^5-6bcx^3+6bx+c^3x^6-3c^2x^4+6cx^2-6\right)e^{a+bx+cx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)*(c*x**2+b*x+a)**3,x)
```

```
[Out] (a**3 + 3*a**2*b*x + 3*a**2*c*x**2 - 3*a**2 + 3*a*b**2*x**2 + 6*a*b*c*x**3
- 6*a*b*x + 3*a*c**2*x**4 - 6*a*c*x**2 + 6*a + b**3*x**3 + 3*b**2*c*x**4 -
```

```
3*b**2*x**2 + 3*b*c**2*x**5 - 6*b*c*x**3 + 6*b*x + c**3*x**6 - 3*c**2*x**4
+ 6*c*x**2 - 6)*exp(a + b*x + c*x**2)
```

Giac [A]
time = 2.82, size = 53, normalized size = 0.59

$$\left(\left(cx^2+bx+a\right)^3+6\,cx^2-3\left(cx^2+bx+a\right)^2+6\,bx+6\,a-6\right)e^{\left(cx^2+bx+a\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^3,x, algorithm="giac")
```

```
[Out] ((c*x^2 + b*x + a)^3 + 6*c*x^2 - 3*(c*x^2 + b*x + a)^2 + 6*b*x + 6*a - 6)*e
^(c*x^2 + b*x + a)
```

Mupad [B]
time = 3.79, size = 145, normalized size = 1.61

$$e^{b\,x}\,e^a\,e^{c\,x^2}\,\left(a^3+3\,a^2\,b\,x+3\,a^2\,c\,x^2-3\,a^2+3\,a\,b^2\,x^2+6\,a\,b\,c\,x^3-6\,a\,b\,x+3\,a\,c^2\,x^4-6\,a\,c\,x^2+6\,a+b^3\,x^3+3\,b^2\,c\,x^4-3\,b^2\,x^2+3\,b\,c^2\,x^5-6\,b\,c\,x^3+6\,b\,x+c^3\,x^6-3\,c^2\,x^4+6\,c\,x^2-6\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^3,x)
```

```
[Out] exp(b*x)*exp(a)*exp(c*x^2)*(6*a + 6*b*x + 6*c*x^2 - 3*a^2 + a^3 - 3*b^2*x^2
 + b^3*x^3 - 3*c^2*x^4 + c^3*x^6 + 3*a*b^2*x^2 + 3*a^2*c*x^2 + 3*a*c^2*x^4
+ 3*b^2*c*x^4 + 3*b*c^2*x^5 - 6*a*b*x + 3*a^2*b*x - 6*a*c*x^2 - 6*b*c*x^3 +
 6*a*b*c*x^3 - 6)
```

3.621 $\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)^2\,dx$

Optimal. Leaf size=64

$$2e^{a+bx+cx^2}-2e^{a+bx+cx^2}\left(a+bx+cx^2\right)+e^{a+bx+cx^2}\left(a+bx+cx^2\right)^2$$

```
[Out] 2*exp(c*x^2+b*x+a)-2*exp(c*x^2+b*x+a)*(c*x^2+b*x+a)+exp(c*x^2+b*x+a)*(c*x^2
+b*x+a)^2
```

Rubi [A]
time = 0.11, antiderivative size = 64, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}=0.097$, Rules used = {6839, 2207, 2225}

$$e^{a+bx+cx^2}\left(a+bx+cx^2\right)^2-2e^{a+bx+cx^2}\left(a+bx+cx^2\right)+2e^{a+bx+cx^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^2,x]
```

```
[Out] 2*E^(a + b*x + c*x^2) - 2*E^(a + b*x + c*x^2)*(a + b*x + c*x^2) + E^(a + b*
x + c*x^2)*(a + b*x + c*x^2)^2
```

Rule 2207

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[(c + d*x)^m*((b*F^(g*(e + f*x)))^n/(f*g*n*Log[F])),
x] - Dist[d*(m/(f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !TrueQ[$UseGamma]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 6839

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)^2\,dx = \text{Subst}\left(\int e^x x^2\,dx, x, a+bx+cx^2\right)$$
$$= e^{a+bx+cx^2}\left(a+bx+cx^2\right)^2 - 2\text{Subst}\left(\int e^x x\,dx, x, a+bx+cx^2\right)$$
$$= -2e^{a+bx+cx^2}\left(a+bx+cx^2\right) + e^{a+bx+cx^2}\left(a+bx+cx^2\right)^2 + 2\text{Subst}$$
$$= 2e^{a+bx+cx^2} - 2e^{a+bx+cx^2}\left(a+bx+cx^2\right) + e^{a+bx+cx^2}\left(a+bx+cx^2\right)$$

Mathematica [A]
time = 0.11, size = 36, normalized size = 0.56

$$e^{a+x(b+cx)}\left(2-2(a+x(b+cx))+(a+x(b+cx))^2\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^2,x]
[Out] E^(a + x*(b + c*x))*(2 - 2*(a + x*(b + c*x)) + (a + x*(b + c*x))^2)
```

Maple [A]
time = 0.11, size = 62, normalized size = 0.97

method	result
derivativedivides	$2\,\mathrm{e}^{c\,x^2+bx+a} - 2\,\mathrm{e}^{c\,x^2+bx+a}(c\,x^2+bx+a) + \mathrm{e}^{c\,x^2+bx+a}(c\,x^2+bx+a)^2$
default	$2\,\mathrm{e}^{c\,x^2+bx+a} - 2\,\mathrm{e}^{c\,x^2+bx+a}(c\,x^2+bx+a) + \mathrm{e}^{c\,x^2+bx+a}(c\,x^2+bx+a)^2$
gosper	$(c^2x^4+2bc\,x^3+2ac\,x^2+b^2x^2+2abx-2c\,x^2+a^2-2bx-2a+2)\,\mathrm{e}^{c\,x^2+bx+a}$
risch	$(c^2x^4+2bc\,x^3+2ac\,x^2+b^2x^2+2abx-2c\,x^2+a^2-2bx-2a+2)\,\mathrm{e}^{c\,x^2+bx+a}$
norman	$(a^2-2a+2)\,\mathrm{e}^{c\,x^2+bx+a} + c^2x^4\mathrm{e}^{c\,x^2+bx+a} + (2ba-2b)\,x\,\mathrm{e}^{c\,x^2+bx+a} + (2ca+b^2-2c)\,x^2\mathrm{e}^{c\,x}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^2,x,method=_RETURNVERBOSE)
[Out] 2*exp(c*x^2+b*x+a)-2*exp(c*x^2+b*x+a)*(c*x^2+b*x+a)+exp(c*x^2+b*x+a)*(c*x^2
+b*x+a)^2
```

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 0.60, size = 1223, normalized size = 19.11

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^2,x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(pi)*a^2*b*erf(sqrt(-c)*x - 1/2*b/sqrt(-c))*e^(a - 1/4*b^2/c)/sqrt(
-c) - 1/2*(sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sq
rt(-(2*c*x + b)^2/c)*c^(3/2)) - 2*e^(1/4*(2*c*x + b)^2/c)/sqrt(c))*a*b^2*e^
(a - 1/4*b^2/c)/sqrt(c) + 1/8*(sqrt(pi)*(2*c*x + b)*b^2*(erf(1/2*sqrt(-(2*c
*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(5/2)) - 4*b*e^(1/4*(2*c*x + b
)^2/c)/c^(3/2) - 4*(2*c*x + b)^3*gamma(3/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x
 + b)^2/c)^(3/2)*c^(5/2)))*b^3*e^(a - 1/4*b^2/c)/sqrt(c) - 1/2*(sqrt(pi)*(2
*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c
^(3/2)) - 2*e^(1/4*(2*c*x + b)^2/c)/sqrt(c))*a^2*sqrt(c)*e^(a - 1/4*b^2/c)
+ 3/4*(sqrt(pi)*(2*c*x + b)*b^2*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt
(-(2*c*x + b)^2/c)*c^(5/2)) - 4*b*e^(1/4*(2*c*x + b)^2/c)/c^(3/2) - 4*(2*c*
x + b)^3*gamma(3/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(5/2)
))*a*b*sqrt(c)*e^(a - 1/4*b^2/c) - 1/4*(sqrt(pi)*(2*c*x + b)*b^3*(erf(1/2*s
qrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(7/2)) - 6*b^2*e^(1/4
*(2*c*x + b)^2/c)/c^(5/2) - 12*(2*c*x + b)^3*b*gamma(3/2, -1/4*(2*c*x + b)^
2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(7/2)) + 8*gamma(2, -1/4*(2*c*x + b)^2/c)/
c^(3/2))*b^2*sqrt(c)*e^(a - 1/4*b^2/c) - 1/4*(sqrt(pi)*(2*c*x + b)*b^3*(erf
(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(7/2)) - 6*b^2*
e^(1/4*(2*c*x + b)^2/c)/c^(5/2) - 12*(2*c*x + b)^3*b*gamma(3/2, -1/4*(2*c*x
 + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(7/2)) + 8*gamma(2, -1/4*(2*c*x + b)
^2/c)/c^(3/2))*a*c^(3/2)*e^(a - 1/4*b^2/c) + 5/32*(sqrt(pi)*(2*c*x + b)*b^4
*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(9/2)) - 8
*b^3*e^(1/4*(2*c*x + b)^2/c)/c^(7/2) - 24*(2*c*x + b)^3*b^2*gamma(3/2, -1/4
*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(9/2)) + 32*b*gamma(2, -1/4*(
2*c*x + b)^2/c)/c^(5/2) - 16*(2*c*x + b)^5*gamma(5/2, -1/4*(2*c*x + b)^2/c)
/((-(2*c*x + b)^2/c)^(5/2)*c^(9/2)))*b*c^(3/2)*e^(a - 1/4*b^2/c) - 1/32*(sq
rt(pi)*(2*c*x + b)*b^5*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x
+ b)^2/c)*c^(11/2)) - 10*b^4*e^(1/4*(2*c*x + b)^2/c)/c^(9/2) - 40*(2*c*x +
b)^3*b^3*gamma(3/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(11/2
)) + 80*b^2*gamma(2, -1/4*(2*c*x + b)^2/c)/c^(7/2) - 80*(2*c*x + b)^5*b*gam
ma(5/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(5/2)*c^(11/2)) - 32*gamm
a(3, -1/4*(2*c*x + b)^2/c)/c^(5/2))*c^(5/2)*e^(a - 1/4*b^2/c)
```

Fricas [A]
time = 0.39, size = 55, normalized size = 0.86

$$\left(c^2x^4 + 2\,bcx^3 + 2\,(a-1)bx + \left(b^2 + 2\,(a-1)c\right)x^2 + a^2 - 2\,a + 2\right)e^{\left(cx^2+bx+a\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^2,x, algorithm="fricas")
```

```
[Out] (c^2*x^4 + 2*b*c*x^3 + 2*(a - 1)*b*x + (b^2 + 2*(a - 1)*c)*x^2 + a^2 - 2*a
+ 2)*e^(c*x^2 + b*x + a)
```

Sympy [A]
time = 0.08, size = 68, normalized size = 1.06

$$\left(a^2+2abx+2acx^2-2a+b^2x^2+2bcx^3-2bx+c^2x^4-2cx^2+2\right)e^{a+bx+cx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)*(c*x**2+b*x+a)**2,x)
```

```
[Out] (a**2 + 2*a*b*x + 2*a*c*x**2 - 2*a + b**2*x**2 + 2*b*c*x**3 - 2*b*x + c**2*
x**4 - 2*c*x**2 + 2)*exp(a + b*x + c*x**2)
```

Giac [A]
time = 3.30, size = 42, normalized size = 0.66

$$-\left(2\,cx^2-\left(cx^2+bx+a\right)^2+2\,bx+2\,a-2\right)e^{\left(cx^2+bx+a\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^2,x, algorithm="giac")
```

```
[Out] -(2*c*x^2 - (c*x^2 + b*x + a)^2 + 2*b*x + 2*a - 2)*e^(c*x^2 + b*x + a)
```

Mupad [B]
time = 3.61, size = 64, normalized size = 1.00

$$\mathrm{e}^{b\,x}\,\mathrm{e}^{a}\,\mathrm{e}^{c\,x^2}\,\left(a^2+2\,a\,b\,x+2\,a\,c\,x^2-2\,a+b^2\,x^2+2\,b\,c\,x^3-2\,b\,x+c^2\,x^4-2\,c\,x^2+2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^2,x)
```

```
[Out] exp(b*x)*exp(a)*exp(c*x^2)*(a^2 - 2*b*x - 2*c*x^2 - 2*a + b^2*x^2 + c^2*x^4
 + 2*a*b*x + 2*a*c*x^2 + 2*b*c*x^3 + 2)
```

3.622 $\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)\,dx$

Optimal. Leaf size=38

$$-e^{a+bx+cx^2}+e^{a+bx+cx^2}\left(a+bx+cx^2\right)$$

```
[Out] -exp(c*x^2+b*x+a)+exp(c*x^2+b*x+a)*(c*x^2+b*x+a)
```

Rubi [A]
time = 0.07, antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$, Rules used = {6839, 2207, 2225}

$$e^{a+bx+cx^2}\left(a+bx+cx^2\right)-e^{a+bx+cx^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2),x]
```

```
[Out] -E^(a + b*x + c*x^2) + E^(a + b*x + c*x^2)*(a + b*x + c*x^2)
```

Rule 2207

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[(c + d*x)^m*((b*F^(g*(e + f*x)))^n/(f*g*n*Log[F])),
x] - Dist[d*(m/(f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !TrueQ[$UseGamma]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 6839

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\begin{aligned}\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)\,dx &= \text{Subst}\left(\int e^x x\,dx, x, a+bx+cx^2\right)\\ &= e^{a+bx+cx^2}\left(a+bx+cx^2\right)-\text{Subst}\left(\int e^x\,dx, x, a+bx+cx^2\right)\\ &= -e^{a+bx+cx^2}+e^{a+bx+cx^2}\left(a+bx+cx^2\right)\end{aligned}$$

Mathematica [A]
time = 0.08, size = 23, normalized size = 0.61

$$e^{a+x(b+cx)}\left(-1+a+bx+cx^2\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2),x]
[Out] E^(a + x*(b + c*x))*(-1 + a + b*x + c*x^2)
```

Maple [A]
time = 0.02, size = 37, normalized size = 0.97

method	result	size
gosper	$\left(c\,x^{2}+bx+a-1\right){\mathrm e}^{c\,x^{2}+bx+a}$	24
risch	$\left(c\,x^{2}+bx+a-1\right){\mathrm e}^{c\,x^{2}+bx+a}$	24
derivativedivides	$-{\mathrm e}^{c\,x^{2}+bx+a}+{\mathrm e}^{c\,x^{2}+bx+a}\left(c\,x^{2}+bx+a\right)$	37
default	$-{\mathrm e}^{c\,x^{2}+bx+a}+{\mathrm e}^{c\,x^{2}+bx+a}\left(c\,x^{2}+bx+a\right)$	37
norman	$\left(a-1\right){\mathrm e}^{c\,x^{2}+bx+a}+bx\,{\mathrm e}^{c\,x^{2}+bx+a}+c\,x^{2}{\mathrm e}^{c\,x^{2}+bx+a}$	47

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a),x,method=_RETURNVERBOSE)
[Out] -exp(c*x^2+b*x+a)+exp(c*x^2+b*x+a)*(c*x^2+b*x+a)
```

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 0.43, size = 501, normalized size = 13.18

$$\frac{\sqrt{\pi}\,ab\,\mathrm{erf}\left(\sqrt{-c}\,x-\frac{b}{2\,\sqrt{-c}}\right)e^{\left(a-\frac{b^2}{4\,c}\right)}}{2\,\sqrt{-c}}-\frac{\left(\frac{\sqrt{\pi}\,(2\,cx+b)b\left(\mathrm{erf}\left(\frac{1}{2}\,\sqrt{-\frac{(2\,cx+b)^2}{c}}\right)-1\right)}{\sqrt{-\frac{(2\,cx+b)^2}{c}}\,c^{\frac{3}{2}}}-\frac{2\,e^{\left(\frac{(2\,cx+b)^2}{4\,c}\right)}}{\sqrt{c}}\right)b^2e^{\left(a-\frac{b^2}{4\,c}\right)}}{4\,\sqrt{c}}-\frac{1}{2}\left(\frac{\sqrt{\pi}\,(2\,cx+b)b\left(\mathrm{erf}\left(\frac{1}{2}\,\sqrt{-\frac{(2\,cx+b)^2}{c}}\right)-1\right)}{\sqrt{-\frac{(2\,cx+b)^2}{c}}\,c^{\frac{3}{2}}}-\frac{2\,e^{\left(\frac{(2\,cx+b)^2}{4\,c}\right)}}{\sqrt{c}}\right)a\sqrt{c}\,e^{\left(a-\frac{b^2}{4\,c}\right)}+\frac{3}{8}\left(\frac{\sqrt{\pi}\,(2\,cx+b)b^2\left(\mathrm{erf}\left(\frac{1}{2}\,\sqrt{-\frac{(2\,cx+b)^2}{c}}\right)-1\right)}{\sqrt{-\frac{(2\,cx+b)^2}{c}}\,c^{\frac{5}{2}}}-\frac{4\,be^{\left(\frac{(2\,cx+b)^2}{4\,c}\right)}}{c^{\frac{3}{2}}}-\frac{4\,(2\,cx+b)^3\Gamma\left(\frac{3}{2},-\frac{(2\,cx+b)^2}{4\,c}\right)}{\left(-\frac{(2\,cx+b)^2}{c}\right)^{\frac{3}{2}}c^{\frac{5}{2}}}\right)b\sqrt{c}\,e^{\left(a-\frac{b^2}{4\,c}\right)}-\frac{1}{8}\left(\frac{\sqrt{\pi}\,(2\,cx+b)b^3\left(\mathrm{erf}\left(\frac{1}{2}\,\sqrt{-\frac{(2\,cx+b)^2}{c}}\right)-1\right)}{\sqrt{-\frac{(2\,cx+b)^2}{c}}\,c^{\frac{7}{2}}}-\frac{6\,b^2e^{\left(\frac{(2\,cx+b)^2}{4\,c}\right)}}{c^{\frac{5}{2}}}-\frac{12\,(2\,cx+b)^3b\Gamma\left(\frac{3}{2},-\frac{(2\,cx+b)^2}{4\,c}\right)}{\left(-\frac{(2\,cx+b)^2}{c}\right)^{\frac{3}{2}}c^{\frac{7}{2}}}+\frac{8\,\Gamma\left(2,-\frac{(2\,cx+b)^2}{4\,c}\right)}{c^{\frac{3}{2}}}\right)c^{\frac{3}{2}}e^{\left(a-\frac{b^2}{4\,c}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a),x, algorithm="maxima")
[Out] 1/2*sqrt(pi)*a*b*erf(sqrt(-c)*x - 1/2*b/sqrt(-c))*e^(a - 1/4*b^2/c)/sqrt(-c
) - 1/4*(sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt
(-(2*c*x + b)^2/c)*c^(3/2)) - 2*e^(1/4*(2*c*x + b)^2/c)/sqrt(c))*b^2*e^(a -
 1/4*b^2/c)/sqrt(c) - 1/2*(sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x + b
)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(3/2)) - 2*e^(1/4*(2*c*x + b)^2/c)/s
qrt(c))*a*sqrt(c)*e^(a - 1/4*b^2/c) + 3/8*(sqrt(pi)*(2*c*x + b)*b^2*(erf(1/
2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(5/2)) - 4*b*e^(1/
4*(2*c*x + b)^2/c)/c^(3/2) - 4*(2*c*x + b)^3*gamma(3/2, -1/4*(2*c*x + b)^2/
c)/((-(2*c*x + b)^2/c)^(3/2)*c^(5/2)))*b*sqrt(c)*e^(a - 1/4*b^2/c) - 1/8*(s
```

```
qrt(pi)*(2*c*x + b)*b^3*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x
 + b)^2/c)*c^(7/2)) - 6*b^2*e^(1/4*(2*c*x + b)^2/c)/c^(5/2) - 12*(2*c*x + b
)^3*b*gamma(3/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(7/2)) +
 8*gamma(2, -1/4*(2*c*x + b)^2/c)/c^(3/2))*c^(3/2)*e^(a - 1/4*b^2/c)
```

Fricas [A]
time = 0.38, size = 23, normalized size = 0.61

$$(cx^2 + bx + a - 1)e^{(cx^2+bx+a)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a),x, algorithm="fricas")
[Out] (c*x^2 + b*x + a - 1)*e^(c*x^2 + b*x + a)
```

Sympy [A]
time = 0.05, size = 22, normalized size = 0.58

$$\left(a + bx + cx^2 - 1\right) e^{a+bx+cx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)*(c*x**2+b*x+a),x)
[Out] (a + b*x + c*x**2 - 1)*exp(a + b*x + c*x**2)
```

Giac [A]
time = 3.62, size = 23, normalized size = 0.61

$$(cx^2 + bx + a - 1)e^{(cx^2+bx+a)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a),x, algorithm="giac")
[Out] (c*x^2 + b*x + a - 1)*e^(c*x^2 + b*x + a)
```

Mupad [B]
time = 0.10, size = 23, normalized size = 0.61

$$\mathrm{e}^{c\,x^2+b\,x+a}\,\left(c\,x^2+b\,x+a-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2),x)
[Out] exp(a + b*x + c*x^2)*(a + b*x + c*x^2 - 1)
```

3.623 $\int e^{a+bx+cx^2}(b+2cx)\,dx$

Optimal. Leaf size=12

$$e^{a+bx+cx^2}$$

[Out] exp(c*x^2+b*x+a)

Rubi [A]
time = 0.01, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.053$, Rules used = {2268}

$$e^{a+bx+cx^2}$$

Antiderivative was successfully verified.

[In] Int[E^(a + b*x + c*x^2)*(b + 2*c*x),x]

[Out] E^(a + b*x + c*x^2)

Rule 2268

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[e*(F^(a + b*x + c*x^2)/(2*c*Log[F])), x] /; FreeQ[{F, a, b, c, d,
 e}, x] && EqQ[b*e - 2*c*d, 0]
```

Rubi steps

$$\int e^{a+bx+cx^2}(b+2cx)\,dx = e^{a+bx+cx^2}$$

Mathematica [A]
time = 0.05, size = 12, normalized size = 1.00

$$e^{a+bx+cx^2}$$

Antiderivative was successfully verified.

[In] Integrate[E^(a + b*x + c*x^2)*(b + 2*c*x),x]

[Out] E^(a + b*x + c*x^2)

Maple [A]
time = 0.02, size = 12, normalized size = 1.00

method	result	size
gosper	$e^{c\,x^2+bx+a}$	12
derivativedivides	$e^{c\,x^2+bx+a}$	12
default	$e^{c\,x^2+bx+a}$	12
norman	$e^{c\,x^2+bx+a}$	12
risch	$e^{c\,x^2+bx+a}$	12

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b),x,method=_RETURNVERBOSE)
[Out] exp(c*x^2+b*x+a)
```

Maxima [A]
time = 0.29, size = 11, normalized size = 0.92

$$e^{\left(cx^2+bx+a\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b),x, algorithm="maxima")
[Out] e^(c*x^2 + b*x + a)
```

Fricas [A]
time = 0.38, size = 11, normalized size = 0.92

$$e^{\left(cx^2+bx+a\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b),x, algorithm="fricas")
[Out] e^(c*x^2 + b*x + a)
```

Sympy [A]
time = 0.03, size = 10, normalized size = 0.83

$$e^{a+bx+cx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b),x)
[Out] exp(a + b*x + c*x**2)
```

Giac [A]
time = 3.51, size = 11, normalized size = 0.92

$$e^{\left(cx^2+bx+a\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b),x, algorithm="giac")
```

```
[Out] e^(c*x^2 + b*x + a)
```

Mupad [B]
time = 0.08, size = 13, normalized size = 1.08

$$e^{bx}\,e^{a}\,e^{cx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x + c*x^2)*(b + 2*c*x),x)
```

```
[Out] exp(b*x)*exp(a)*exp(c*x^2)
```

3.624 $\int \frac{e^{a+bx+cx^2}(b+2cx)}{a+bx+cx^2}\,dx$

Optimal. Leaf size=11

$$\operatorname{Ei}\left(a+bx+cx^2\right)$$

```
[Out] Ei(c*x^2+b*x+a)
```

Rubi [A]
time = 0.12, antiderivative size = 11, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.065$, Rules used = {6839, 2209}

$$\operatorname{Ei}\left(a+bx+cx^2\right)$$

Antiderivative was successfully verified.

```
[In] Int[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2),x]
```

```
[Out] ExpIntegralEi[a + b*x + c*x^2]
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 6839

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{a+bx+cx^2}(b+2cx)}{a+bx+cx^2}\,dx &= \operatorname{Subst}\left(\int \frac{e^x}{x}\,dx, x, a+bx+cx^2\right)\\ &= \operatorname{Ei}\left(a+bx+cx^2\right)\end{aligned}$$

Mathematica [A]
time = 0.10, size = 10, normalized size = 0.91

$$\operatorname{Ei}(a+x(b+cx))$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2),x]
[Out] ExpIntegralEi[a + x*(b + c*x)]
```

Maple [A]
time = 0.10, size = 19, normalized size = 1.73

method	result	size
derivativedivides	$-\operatorname{expIntegral}\left(1, -c\,x^{2}-b x -a \right)$	19
default	$-\operatorname{expIntegral}\left(1, -c\,x^{2}-b x -a \right)$	19
risch	$-\operatorname{expIntegral}\left(1, -c\,x^{2}-b x -a \right)$	19

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a),x,method=_RETURNVERBOSE)
[Out] -Ei(1,-c*x^2-b*x-a)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a),x, algorithm="maxima")
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a), x)
```

Fricas [A]
time = 0.40, size = 11, normalized size = 1.00

$$\operatorname{Ei}\left(cx^{2} + bx + a\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a),x, algorithm="fricas")
[Out] Ei(c*x^2 + b*x + a)
```

Sympy [A]
time = 9.08, size = 10, normalized size = 0.91

$$\operatorname{Ei}\left(a + bx + cx^{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)/(c*x**2+b*x+a),x)
[Out] Ei(a + b*x + c*x**2)
```

Giac [A]
time = 3.84, size = 11, normalized size = 1.00

$$\mathrm{Ei}\left(cx^2 + bx + a\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a),x, algorithm="giac")
[Out] Ei(c*x^2 + b*x + a)
```

Mupad [B]
time = 3.79, size = 11, normalized size = 1.00

$$\mathrm{ei}\left(c\,x^2 + b\,x + a\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2),x)
[Out] ei(a + b*x + c*x^2)
```

3.625 $\int \frac{e^{a+bx+cx^2}(b+2cx)}{(a+bx+cx^2)^2}\,dx$

Optimal. Leaf size=38

$$-\frac{e^{a+bx+cx^2}}{a+bx+cx^2}+\text{Ei}\left(a+bx+cx^2\right)$$

```
[Out] -exp(c*x^2+b*x+a)/(c*x^2+b*x+a)+Ei(c*x^2+b*x+a)
```

Rubi [A]
time = 0.13, antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6839, 2208, 2209}

$$\text{Ei}\left(cx^2+bx+a\right)-\frac{e^{a+bx+cx^2}}{a+bx+cx^2}$$

Antiderivative was successfully verified.

```
[In] Int[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^2,x]
```

```
[Out] -(E^(a + b*x + c*x^2)/(a + b*x + c*x^2)) + ExpIntegralEi[a + b*x + c*x^2]
```

Rule 2208

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_), x_Symbol] :> Simp[(c + d*x)^(m + 1)*((b*F^(g*(e + f*x)))^n/(d*(m + 1)))
, x] - Dist[f*g*n*(Log[F]/(d*(m + 1))), Int[(c + d*x)^(m + 1)*(b*F^(g*(e +
f*x)))^n, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && LtQ[m, -1] && Int
egerQ[2*m] &&  !TrueQ[$UseGamma]
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 6839

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\int \frac{e^{a+bx+cx^2}(b+2cx)}{(a+bx+cx^2)^2}\,dx = \text{Subst}\left(\int \frac{e^x}{x^2}\,dx, x, a+bx+cx^2\right)$$
$$= -\frac{e^{a+bx+cx^2}}{a+bx+cx^2} + \text{Subst}\left(\int \frac{e^x}{x}\,dx, x, a+bx+cx^2\right)$$
$$= -\frac{e^{a+bx+cx^2}}{a+bx+cx^2} + \text{Ei}\left(a+bx+cx^2\right)$$

Mathematica [**A**]
time = 0.12, size = 35, normalized size = 0.92

$$-\frac{e^{a+x(b+cx)}}{a+x(b+cx)} + \text{Ei}(a+x(b+cx))$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^2,x]
[Out] -(E^(a + x*(b + c*x))/(a + x*(b + c*x))) + ExpIntegralEi[a + x*(b + c*x)]
```

Maple [**A**]
time = 0.11, size = 45, normalized size = 1.18

method	result	size
derivativedivides	$-\frac{e^{c\,x^2+bx+a}}{c\,x^2+bx+a} - \text{expIntegral}\left(1, -c\,x^2 - bx - a\right)$	45
default	$-\frac{e^{c\,x^2+bx+a}}{c\,x^2+bx+a} - \text{expIntegral}\left(1, -c\,x^2 - bx - a\right)$	45
risch	$-\frac{e^{c\,x^2+bx+a}}{c\,x^2+bx+a} - \text{expIntegral}\left(1, -c\,x^2 - bx - a\right)$	45

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^2,x,method=_RETURNVERBOSE)
[Out] -exp(c*x^2+b*x+a)/(c*x^2+b*x+a)-Ei(1,-c*x^2-b*x-a)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^2,x, algorithm="maxima")
```

```
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a)^2, x)
```

Fricas [A]
time = 0.37, size = 49, normalized size = 1.29

$$\frac{(cx^2 + bx + a)\text{Ei}(cx^2 + bx + a) - e^{(cx^2+bx+a)}}{cx^2 + bx + a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^2,x, algorithm="fricas")
```

```
[Out] ((c*x^2 + b*x + a)*Ei(c*x^2 + b*x + a) - e^(c*x^2 + b*x + a))/(c*x^2 + b*x
+ a)
```

Sympy [A]
time = 84.57, size = 24, normalized size = 0.63

$$-\frac{\text{E}_2\left(-a - bx - cx^2\right)}{a + bx + cx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)/(c*x**2+b*x+a)**2,x)
```

```
[Out] -expint(2, -a - b*x - c*x**2)/(a + b*x + c*x**2)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^2,x, algorithm="giac")
```

```
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a)^2, x)
```

Mupad [B]
time = 3.99, size = 44, normalized size = 1.16

$$-\text{expint}\left(-c\,x^2 - b\,x - a\right) - \frac{e^{b\,x}\,e^{a}\,e^{c\,x^2}}{c\,x^2 + b\,x + a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^2,x)
```

```
[Out] - expint(- a - b*x - c*x^2) - (exp(b*x)*exp(a)*exp(c*x^2))/(a + b*x + c*x^2
)
```

3.626 $\int \frac{e^{a+bx+cx^2}(b+2cx)}{(a+bx+cx^2)^3} dx$

Optimal. Leaf size=72

$$-\frac{e^{a+bx+cx^2}}{2\left(a+bx+cx^2\right)^2}-\frac{e^{a+bx+cx^2}}{2\left(a+bx+cx^2\right)}+\frac{1}{2}\text{Ei}\left(a+bx+cx^2\right)$$

```
[Out] -1/2*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^2-1/2*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)+1/
2*Ei(c*x^2+b*x+a)
```

Rubi [A]
time = 0.17, antiderivative size = 72, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6839, 2208, 2209}

$$\frac{1}{2}\text{Ei}\left(cx^2+bx+a\right)-\frac{e^{a+bx+cx^2}}{2\left(a+bx+cx^2\right)}-\frac{e^{a+bx+cx^2}}{2\left(a+bx+cx^2\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^3,x]
```

```
[Out] -1/2*E^(a + b*x + c*x^2)/(a + b*x + c*x^2)^2 - E^(a + b*x + c*x^2)/(2*(a +
b*x + c*x^2)) + ExpIntegralEi[a + b*x + c*x^2]/2
```

Rule 2208

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_), x_Symbol] :> Simp[(c + d*x)^(m + 1)*((b*F^(g*(e + f*x)))^n/(d*(m + 1)))
, x] - Dist[f*g*n*(Log[F]/(d*(m + 1))), Int[(c + d*x)^(m + 1)*(b*F^(g*(e +
f*x)))^n, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && LtQ[m, -1] && Int
egerQ[2*m] &&  !TrueQ[$UseGamma]
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 6839

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\int \frac{e^{a+bx+cx^2}(b+2cx)}{(a+bx+cx^2)^3}\,dx = \text{Subst}\left(\int \frac{e^x}{x^3}\,dx, x, a+bx+cx^2\right)$$
$$= -\frac{e^{a+bx+cx^2}}{2(a+bx+cx^2)^2} + \frac{1}{2}\text{Subst}\left(\int \frac{e^x}{x^2}\,dx, x, a+bx+cx^2\right)$$
$$= -\frac{e^{a+bx+cx^2}}{2(a+bx+cx^2)^2} - \frac{e^{a+bx+cx^2}}{2(a+bx+cx^2)} + \frac{1}{2}\text{Subst}\left(\int \frac{e^x}{x}\,dx, x, a+bx+cx^2\right)$$
$$= -\frac{e^{a+bx+cx^2}}{2(a+bx+cx^2)^2} - \frac{e^{a+bx+cx^2}}{2(a+bx+cx^2)} + \frac{1}{2}\text{Ei}(a+bx+cx^2)$$

Mathematica [A]
time = 0.14, size = 50, normalized size = 0.69

$$\frac{1}{2}\left(-\frac{e^{a+x(b+cx)}(1+a+bx+cx^2)}{(a+x(b+cx))^2} + \text{Ei}(a+x(b+cx))\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^3,x]
```

```
[Out] (-((E^(a + x*(b + c*x))*(1 + a + b*x + c*x^2))/(a + x*(b + c*x))^2) + ExpIn
tegralEi[a + x*(b + c*x)])/2
```

Maple [A]
time = 0.11, size = 70, normalized size = 0.97

method	result	size
derivativedivides	$-\frac{e^{c\,x^2+bx+a}}{2(c\,x^2+bx+a)^2}-\frac{e^{c\,x^2+bx+a}}{2(c\,x^2+bx+a)}-\frac{\text{expIntegral}(1,-c\,x^2-bx-a)}{2}$	70
default	$-\frac{e^{c\,x^2+bx+a}}{2(c\,x^2+bx+a)^2}-\frac{e^{c\,x^2+bx+a}}{2(c\,x^2+bx+a)}-\frac{\text{expIntegral}(1,-c\,x^2-bx-a)}{2}$	70
risch	$-\frac{e^{c\,x^2+bx+a}}{2(c\,x^2+bx+a)^2}-\frac{e^{c\,x^2+bx+a}}{2(c\,x^2+bx+a)}-\frac{\text{expIntegral}(1,-c\,x^2-bx-a)}{2}$	70

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^2-1/2*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)-1/
2*Ei(1,-c*x^2-b*x-a)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^3,x, algorithm="maxima")
```

```
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a)^3, x)
```

Fricas [A]
time = 0.37, size = 111, normalized size = 1.54

$$\frac{(c^2x^4 + 2\,bcx^3 + 2\,abx + (b^2 + 2\,ac)x^2 + a^2)\mathrm{Ei}(cx^2 + bx + a) - (cx^2 + bx + a + 1)e^{(cx^2+bx+a)}}{2\,(c^2x^4 + 2\,bcx^3 + 2\,abx + (b^2 + 2\,ac)x^2 + a^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^3,x, algorithm="fricas")
```

```
[Out] 1/2*((c^2*x^4 + 2*b*c*x^3 + 2*a*b*x + (b^2 + 2*a*c)*x^2 + a^2)*Ei(c*x^2 + b
*x + a) - (c*x^2 + b*x + a + 1)*e^(c*x^2 + b*x + a))/(c^2*x^4 + 2*b*c*x^3 +
 2*a*b*x + (b^2 + 2*a*c)*x^2 + a^2)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)/(c*x**2+b*x+a)**3,x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^3,x, algorithm="giac")
```

```
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a)^3, x)
```

Mupad [B]
time = 4.04, size = 62, normalized size = 0.86

$$-\frac{\mathrm{expint}(-c\,x^2 - b\,x - a)}{2} - \mathrm{e}^{c\,x^2+b\,x+a}\left(\frac{1}{2\,(c\,x^2 + b\,x + a)} + \frac{1}{2\,{(c\,x^2 + b\,x + a)}^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^3,x)
```

```
[Out] - expint(- a - b*x - c*x^2)/2 - exp(a + b*x + c*x^2)*(1/(2*(a + b*x + c*x^2
)) + 1/(2*(a + b*x + c*x^2)^2))
```

3.627 $\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)^{7/2}\,dx$

Optimal. Leaf size=142

$$-\frac{105}{8}e^{a+bx+cx^2}\sqrt{a+bx+cx^2}+\frac{35}{4}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2}-\frac{7}{2}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{5/2}+e^{a+bx+cx^2}\left(a+b\right.$$

```
[Out] 35/4*exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(3/2)-7/2*exp(c*x^2+b*x+a)*(c*x^2+b*x+a
)^(5/2)+exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(7/2)+105/16*erfi((c*x^2+b*x+a)^(1/2
))*Pi^(1/2)-105/8*exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(1/2)
```

Rubi [A]
time = 0.43, antiderivative size = 142, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}=0.121$, Rules used = {6839, 2207, 2211, 2235}

$$\frac{105}{16}\sqrt{\pi}\,\mathrm{Erfi}\left(\sqrt{a+bx+cx^2}\right)+e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{7/2}-\frac{7}{2}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{5/2}+\frac{35}{4}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2}-\frac{105}{8}e^{a+bx+cx^2}\sqrt{a+bx+cx^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^(7/2),x]
```

```
[Out] (-105*E^(a + b*x + c*x^2)*Sqrt[a + b*x + c*x^2])/8 + (35*E^(a + b*x + c*x^2
)*(a + b*x + c*x^2)^(3/2))/4 - (7*E^(a + b*x + c*x^2)*(a + b*x + c*x^2)^(5/
2))/2 + E^(a + b*x + c*x^2)*(a + b*x + c*x^2)^(7/2) + (105*Sqrt[Pi]*Erfi[Sq
rt[a + b*x + c*x^2]])/16
```

Rule 2207

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[(c + d*x)^m*((b*F^(g*(e + f*x)))^n/(f*g*n*Log[F])),
x] - Dist[d*(m/(f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !TrueQ[$UseGamma]
```

Rule 2211

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :
> Dist[2/d, Subst[Int[F^(g*(e - c*(f/d)) + f*g*(x^2/d)), x], x, Sqrt[c + d*
x]], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 6839

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)^{7/2}\,dx = \text{Subst}\left(\int e^x x^{7/2}\,dx, x, a+bx+cx^2\right)$$
$$= e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{7/2} - \frac{7}{2}\text{Subst}\left(\int e^x x^{5/2}\,dx, x, a+bx-\right.$$
$$= -\frac{7}{2}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{5/2} + e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{7/2} +$$
$$= \frac{35}{4}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2} - \frac{7}{2}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{5/2} -$$
$$= -\frac{105}{8}e^{a+bx+cx^2}\sqrt{a+bx+cx^2} + \frac{35}{4}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/}$$
$$= -\frac{105}{8}e^{a+bx+cx^2}\sqrt{a+bx+cx^2} + \frac{35}{4}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/}$$
$$= -\frac{105}{8}e^{a+bx+cx^2}\sqrt{a+bx+cx^2} + \frac{35}{4}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/}$$

Mathematica [A]
time = 2.52, size = 47, normalized size = 0.33

$$-\frac{\sqrt{a+x(b+cx)}\,\Gamma\left(\frac{9}{2},-a-x(b+cx)\right)}{\sqrt{-a-x(b+cx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^(7/2),x]
```

```
[Out] -((Sqrt[a + x*(b + c*x)]*Gamma[9/2, -a - x*(b + c*x)])/Sqrt[-a - x*(b + c*x
)])
```

Maple [A]
time = 0.11, size = 119, normalized size = 0.84

method	result
derivativedivides	$\frac{35\,e^{c\,x^2+bx+a}\left(c\,x^2+bx+a\right)^{\frac{3}{2}}}{4} - \frac{7\,e^{c\,x^2+bx+a}\left(c\,x^2+bx+a\right)^{\frac{5}{2}}}{2} + e^{c\,x^2+bx+a}\left(c\,x^2+bx+a\right)^{\frac{7}{2}} + \frac{105\,\mathrm{erfi}\left(\sqrt{c}\right.}{}$

default	$\frac{35\,\mathrm{e}^{c\,x^2+bx+a}\left(c\,x^2+bx+a\right)^{\frac{3}{2}}}{4}-\frac{7\,\mathrm{e}^{c\,x^2+bx+a}\left(c\,x^2+bx+a\right)^{\frac{5}{2}}}{2}+\mathrm{e}^{c\,x^2+bx+a}\left(c\,x^2+bx+a\right)^{\frac{7}{2}}+\frac{105\,\mathrm{erfi}\left(\sqrt{c\,x\right.}}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] 35/4*exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(3/2)-7/2*exp(c*x^2+b*x+a)*(c*x^2+b*x+a
)^(5/2)+exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(7/2)+105/16*erfi((c*x^2+b*x+a)^(1/2
))*Pi^(1/2)-105/8*exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(1/2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(7/2),x, algorithm="maxi
ma")
```

```
[Out] integrate((c*x^2 + b*x + a)^(7/2)*(2*c*x + b)*e^(c*x^2 + b*x + a), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(7/2),x, algorithm="fric
as")
```

```
[Out] integral((2*c^4*x^7 + 7*b*c^3*x^6 + 3*(3*b^2*c^2 + 2*a*c^3)*x^5 + 5*(b^3*c
+ 3*a*b*c^2)*x^4 + a^3*b + (b^4 + 12*a*b^2*c + 6*a^2*c^2)*x^3 + 3*(a*b^3 +
3*a^2*b*c)*x^2 + (3*a^2*b^2 + 2*a^3*c)*x)*sqrt(c*x^2 + b*x + a)*e^(c*x^2 +
b*x + a), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)*(c*x**2+b*x+a)**(7/2),x)
```

```
[Out] Timed out
```

Giac [C] Result contains complex when optimal does not.
time = 3.59, size = 91, normalized size = 0.64

$$\frac{1}{8}\left(8\left(cx^2+bx+a\right)^{\frac{7}{2}}-28\left(cx^2+bx+a\right)^{\frac{5}{2}}+70\left(cx^2+bx+a\right)^{\frac{3}{2}}-105\sqrt{cx^2+bx+a}\right)e^{\left(cx^2+bx+a\right)}+\frac{105}{16}i\sqrt{\pi}\,\operatorname{erf}\left(-i\sqrt{cx^2+bx+a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(7/2),x, algorithm="giac
")
```

```
[Out] 1/8*(8*(c*x^2 + b*x + a)^(7/2) - 28*(c*x^2 + b*x + a)^(5/2) + 70*(c*x^2 + b
*x + a)^(3/2) - 105*sqrt(c*x^2 + b*x + a))*e^(c*x^2 + b*x + a) + 105/16*I*s
qrt(pi)*erf(-I*sqrt(c*x^2 + b*x + a))
```

Mupad [B]
time = 4.22, size = 135, normalized size = 0.95

$$\frac{\left(e^{c\,x^2+b\,x+a}\left(\frac{105\,\sqrt{-c\,x^2-b\,x-a}}{8}+\frac{35\,\left(-c\,x^2-b\,x-a\right)^{3/2}}{4}+\frac{7\,\left(-c\,x^2-b\,x-a\right)^{5/2}}{2}+\left(-c\,x^2-b\,x-a\right)^{7/2}\right)+\frac{105\,\sqrt{\pi}\,\operatorname{erfc}\left(\sqrt{-c\,x^2-b\,x-a}\right)}{16}\right)\left(c\,x^2+b\,x+a\right)^{7/2}}{\left(-c\,x^2-b\,x-a\right)^{7/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^(7/2),x)
```

```
[Out] ((exp(a + b*x + c*x^2)*((105*(- a - b*x - c*x^2)^(1/2))/8 + (35*(- a - b*x
- c*x^2)^(3/2))/4 + (7*(- a - b*x - c*x^2)^(5/2))/2 + (- a - b*x - c*x^2)^(
7/2)) + (105*pi^(1/2)*erfc((- a - b*x - c*x^2)^(1/2)))/16)*(a + b*x + c*x^2
)^(7/2))/(- a - b*x - c*x^2)^(7/2)
```

3.628 $\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)^{5/2}\,dx$

Optimal. Leaf size=112

$$\frac{15}{4}e^{a+bx+cx^2}\sqrt{a+bx+cx^2}-\frac{5}{2}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2}+e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{5/2}-\frac{15}{8}\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{a+bx$$

```
[Out] -5/2*exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(3/2)+exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(5
/2)-15/8*erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)+15/4*exp(c*x^2+b*x+a)*(c*x^2+b*
x+a)^(1/2)
```

Rubi [A]
time = 0.31, antiderivative size = 112, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.121$, Rules used = {6839, 2207, 2211, 2235}

$$-\frac{15}{8}\sqrt{\pi}\,\mathrm{Erfi}\left(\sqrt{a+bx+cx^2}\right)+e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{5/2}-\frac{5}{2}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2}+\frac{15}{4}e^{a+bx+cx^2}\sqrt{a+bx+cx^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^(5/2),x]
```

```
[Out] (15*E^(a + b*x + c*x^2)*Sqrt[a + b*x + c*x^2])/4 - (5*E^(a + b*x + c*x^2)*(
a + b*x + c*x^2)^(3/2))/2 + E^(a + b*x + c*x^2)*(a + b*x + c*x^2)^(5/2) - (
15*Sqrt[Pi]*Erfi[Sqrt[a + b*x + c*x^2]])/8
```

Rule 2207

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[(c + d*x)^m*((b*F^(g*(e + f*x)))^n/(f*g*n*Log[F])),
x] - Dist[d*(m/(f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !TrueQ[$UseGamma]
```

Rule 2211

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :
> Dist[2/d, Subst[Int[F^(g*(e - c*(f/d)) + f*g*(x^2/d)), x], x, Sqrt[c + d*
x]], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 6839

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\begin{aligned}
\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)^{5/2}\,dx &= \text{Subst}\left(\int e^x x^{5/2}\,dx, x, a+bx+cx^2\right)\\
&= e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{5/2} - \frac{5}{2}\text{Subst}\left(\int e^x x^{3/2}\,dx, x, a+bx-\right.\\
&= -\frac{5}{2}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2} + e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{5/2} +\\
&= \frac{15}{4}e^{a+bx+cx^2}\sqrt{a+bx+cx^2} - \frac{5}{2}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2} +\\
&= \frac{15}{4}e^{a+bx+cx^2}\sqrt{a+bx+cx^2} - \frac{5}{2}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2} +\\
&= \frac{15}{4}e^{a+bx+cx^2}\sqrt{a+bx+cx^2} - \frac{5}{2}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2} +
\end{aligned}$$

Mathematica [A]
time = 2.01, size = 46, normalized size = 0.41

$$\frac{\sqrt{a+x(b+cx)}\,\Gamma\left(\frac{7}{2},-a-x(b+cx)\right)}{\sqrt{-a-x(b+cx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^(5/2),x]
[Out] (Sqrt[a + x*(b + c*x)]*Gamma[7/2, -a - x*(b + c*x)])/Sqrt[-a - x*(b + c*x)]
```

Maple [A]
time = 0.13, size = 94, normalized size = 0.84

method	result
derivativedivides	$-\frac{5\,\mathrm{e}^{c\,x^2+bx+a}\left(c\,x^2+bx+a\right)^{\frac{3}{2}}}{2}+\mathrm{e}^{c\,x^2+bx+a}\left(c\,x^2+bx+a\right)^{\frac{5}{2}}-\frac{15\,\mathrm{erfi}\left(\sqrt{c\,x^2+bx+a}\right)\sqrt{\pi}}{8}+\frac{15}{}$
default	$-\frac{5\,\mathrm{e}^{c\,x^2+bx+a}\left(c\,x^2+bx+a\right)^{\frac{3}{2}}}{2}+\mathrm{e}^{c\,x^2+bx+a}\left(c\,x^2+bx+a\right)^{\frac{5}{2}}-\frac{15\,\mathrm{erfi}\left(\sqrt{c\,x^2+bx+a}\right)\sqrt{\pi}}{8}+\frac{15}{}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -5/2*exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(3/2)+exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(5
/2)-15/8*erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)+15/4*exp(c*x^2+b*x+a)*(c*x^2+b*
x+a)^(1/2)
```

Maxima [**F**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(5/2),x, algorithm="maxi
ma")
```

```
[Out] integrate((c*x^2 + b*x + a)^(5/2)*(2*c*x + b)*e^(c*x^2 + b*x + a), x)
```

Fricas [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(5/2),x, algorithm="fric
as")
```

```
[Out] integral((2*c^3*x^5 + 5*b*c^2*x^4 + 4*(b^2*c + a*c^2)*x^3 + a^2*b + (b^3 +
6*a*b*c)*x^2 + 2*(a*b^2 + a^2*c)*x)*sqrt(c*x^2 + b*x + a)*e^(c*x^2 + b*x +
a), x)
```

Sympy [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)*(c*x**2+b*x+a)**(5/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 6188 deep
```

Giac [**C**] Result contains complex when optimal does not.
time = 2.95, size = 77, normalized size = 0.69

$$\frac{1}{4}\left(4\left(cx^2+bx+a\right)^{\frac{5}{2}}-10\left(cx^2+bx+a\right)^{\frac{3}{2}}+15\sqrt{cx^2+bx+a}\right)e^{(cx^2+bx+a)}-\frac{15}{8}i\sqrt{\pi}\,\mathrm{erf}\left(-i\sqrt{cx^2+bx+a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(5/2),x, algorithm="giac
")
```

```
[Out] 1/4*(4*(c*x^2 + b*x + a)^(5/2) - 10*(c*x^2 + b*x + a)^(3/2) + 15*sqrt(c*x^2
 + b*x + a))*e^(c*x^2 + b*x + a) - 15/8*I*sqrt(pi)*erf(-I*sqrt(c*x^2 + b*x
+ a))
```

Mupad [B]
time = 3.91, size = 117, normalized size = 1.04

$$\frac{\left(e^{c x^2+b x+a}\left(\frac{15\sqrt{-c x^2-b x-a}}{4}+\frac{5\left(-c x^2-b x-a\right)^{3/2}}{2}+\left(-c x^2-b x-a\right)^{5/2}\right)+\frac{15\sqrt{\pi}\,\mathrm{erfc}\left(\sqrt{-c x^2-b x-a}\right)}{8}\right)\left(c x^2+b x+a\right)^{5/2}}{\left(-c x^2-b x-a\right)^{5/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^(5/2),x)
```

```
[Out] ((exp(a + b*x + c*x^2)*((15*(- a - b*x - c*x^2)^(1/2))/4 + (5*(- a - b*x -
c*x^2)^(3/2))/2 + (- a - b*x - c*x^2)^(5/2)) + (15*pi^(1/2)*erfc((- a - b*x
 - c*x^2)^(1/2)))/8)*(a + b*x + c*x^2)^(5/2))/(- a - b*x - c*x^2)^(5/2)
```

3.629 $\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)^{3/2}\,dx$

Optimal. Leaf size=82

$$-\frac{3}{2}e^{a+bx+cx^2}\sqrt{a+bx+cx^2}+e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2}+\frac{3}{4}\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{a+bx+cx^2}\right)$$

```
[Out] exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(3/2)+3/4*erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)
-3/2*exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(1/2)
```

Rubi [A]
time = 0.24, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}=0.121$, Rules used = {6839, 2207, 2211, 2235}

$$\frac{3}{4}\sqrt{\pi}\,\mathrm{Erfi}\left(\sqrt{a+bx+cx^2}\right)+e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2}-\frac{3}{2}e^{a+bx+cx^2}\sqrt{a+bx+cx^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^(3/2),x]
```

```
[Out] (-3*E^(a + b*x + c*x^2)*Sqrt[a + b*x + c*x^2])/2 + E^(a + b*x + c*x^2)*(a +
 b*x + c*x^2)^(3/2) + (3*Sqrt[Pi]*Erfi[Sqrt[a + b*x + c*x^2]])/4
```

Rule 2207

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[(c + d*x)^m*((b*F^(g*(e + f*x)))^n/(f*g*n*Log[F])),
x] - Dist[d*(m/(f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !TrueQ[$UseGamma]
```

Rule 2211

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :
> Dist[2/d, Subst[Int[F^(g*(e - c*(f/d)) + f*g*(x^2/d)), x], x, Sqrt[c + d*
x]], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 6839

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
```

```
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)^{3/2}\,dx = \text{Subst}\left(\int e^x x^{3/2}\,dx, x, a+bx+cx^2\right)$$
$$= e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2} - \frac{3}{2}\text{Subst}\left(\int e^x\sqrt{x}\,dx, x, a+bx$$
$$= -\frac{3}{2}e^{a+bx+cx^2}\sqrt{a+bx+cx^2} + e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2} + \frac{3}{4}$$
$$= -\frac{3}{2}e^{a+bx+cx^2}\sqrt{a+bx+cx^2} + e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2} + \frac{3}{2}$$
$$= -\frac{3}{2}e^{a+bx+cx^2}\sqrt{a+bx+cx^2} + e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2} + \frac{3}{4}$$

Mathematica [A]
time = 1.91, size = 47, normalized size = 0.57

$$-\frac{\sqrt{a+x(b+cx)}\,\Gamma\left(\frac{5}{2},-a-x(b+cx)\right)}{\sqrt{-a-x(b+cx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^(3/2),x]
[Out] -((Sqrt[a + x*(b + c*x)]*Gamma[5/2, -a - x*(b + c*x)])/Sqrt[-a - x*(b + c*x
)])
```

Maple [A]
time = 0.10, size = 69, normalized size = 0.84

method	result
derivativedivides	$e^{c\,x^2+bx+a}(c\,x^2+bx+a)^{\frac{3}{2}}+\frac{3\,\mathrm{erfi}\left(\sqrt{c\,x^2+bx+a}\right)\sqrt{\pi}}{4}-\frac{3\,e^{c\,x^2+bx+a}\sqrt{c\,x^2+bx+a}}{2}$
default	$e^{c\,x^2+bx+a}(c\,x^2+bx+a)^{\frac{3}{2}}+\frac{3\,\mathrm{erfi}\left(\sqrt{c\,x^2+bx+a}\right)\sqrt{\pi}}{4}-\frac{3\,e^{c\,x^2+bx+a}\sqrt{c\,x^2+bx+a}}{2}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(3/2),x,method=_RETURNVERBOSE)
[Out] exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(3/2)+3/4*erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)
-3/2*exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(1/2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(3/2),x, algorithm="maxi
ma")
```

```
[Out] integrate((c*x^2 + b*x + a)^(3/2)*(2*c*x + b)*e^(c*x^2 + b*x + a), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(3/2),x, algorithm="fric
as")
```

```
[Out] integral((2*c^2*x^3 + 3*b*c*x^2 + a*b + (b^2 + 2*a*c)*x)*sqrt(c*x^2 + b*x +
 a)*e^(c*x^2 + b*x + a), x)
```

Sympy [A]
time = 56.66, size = 94, normalized size = 1.15

$$\frac{\left(-\sqrt{-a-bx-cx^2}\left(a+bx+cx^2-\frac{3}{2}\right)e^{a+bx+cx^2}+\frac{3\sqrt{\pi}\operatorname{erfc}\left(\sqrt{-a-bx-cx^2}\right)}{4}\right)\left(a+bx+cx^2\right)^{\frac{3}{2}}}{\left(-a-bx-cx^2\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)*(c*x**2+b*x+a)**(3/2),x)
```

```
[Out] (-sqrt(-a - b*x - c*x**2)*(a + b*x + c*x**2 - 3/2)*exp(a + b*x + c*x**2) +
3*sqrt(pi)*erfc(sqrt(-a - b*x - c*x**2))/4)*(a + b*x + c*x**2)**(3/2)/(-a -
 b*x - c*x**2)**(3/2)
```

Giac [C] Result contains complex when optimal does not.
time = 2.50, size = 63, normalized size = 0.77

$$\frac{1}{2}\left(2\left(cx^2+bx+a\right)^{\frac{3}{2}}-3\sqrt{cx^2+bx+a}\right)e^{\left(cx^2+bx+a\right)}+\frac{3}{4}i\sqrt{\pi}\operatorname{erf}\left(-i\sqrt{cx^2+bx+a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(3/2),x, algorithm="giac
")
```

[Out] 1/2*(2*(c*x^2 + b*x + a)^(3/2) - 3*sqrt(c*x^2 + b*x + a))*e^(c*x^2 + b*x + a) + 3/4*I*sqrt(pi)*erf(-I*sqrt(c*x^2 + b*x + a))

Mupad [B]
time = 3.77, size = 102, normalized size = 1.24

$$\frac{3\sqrt{\pi}\,\mathrm{erfc}\left(\sqrt{-c\,x^2-b\,x-a}\right)\,\left(c\,x^2+b\,x+a\right)^{3/2}}{4\left(-c\,x^2-b\,x-a\right)^{3/2}}-\frac{3\,\mathrm{e}^{b\,x}\,\mathrm{e}^{a}\,\mathrm{e}^{c\,x^2}\,\sqrt{c\,x^2+b\,x+a}}{2}+\mathrm{e}^{b\,x}\,\mathrm{e}^{a}\,\mathrm{e}^{c\,x^2}\,\left(c\,x^2+b\,x+a\right)^{3/2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(exp(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^(3/2),x)

[Out] (3*pi^(1/2)*erfc((- a - b*x - c*x^2)^(1/2))*(a + b*x + c*x^2)^(3/2))/(4*(- a - b*x - c*x^2)^(3/2)) - (3*exp(b*x)*exp(a)*exp(c*x^2)*(a + b*x + c*x^2)^(1/2))/2 + exp(b*x)*exp(a)*exp(c*x^2)*(a + b*x + c*x^2)^(3/2)

3.630 $\int e^{a+bx+cx^2}(b+2cx)\sqrt{a+bx+cx^2}\,dx$

Optimal. Leaf size=52

$$e^{a+bx+cx^2}\sqrt{a+bx+cx^2}-\frac{1}{2}\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{a+bx+cx^2}\right)$$

```
[Out] -1/2*erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)+exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(1/2
)
```

Rubi [A]
time = 0.16, antiderivative size = 52, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.121$, Rules used = {6839, 2207, 2211, 2235}

$$e^{a+bx+cx^2}\sqrt{a+bx+cx^2}-\frac{1}{2}\sqrt{\pi}\,\mathrm{Erfi}\left(\sqrt{a+bx+cx^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x + c*x^2)*(b + 2*c*x)*Sqrt[a + b*x + c*x^2],x]
```

```
[Out] E^(a + b*x + c*x^2)*Sqrt[a + b*x + c*x^2] - (Sqrt[Pi]*Erfi[Sqrt[a + b*x + c
*x^2]])/2
```

Rule 2207

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[(c + d*x)^m*((b*F^(g*(e + f*x)))^n/(f*g*n*Log[F])),
x] - Dist[d*(m/(f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !TrueQ[$UseGamma]
```

Rule 2211

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :
> Dist[2/d, Subst[Int[F^(g*(e - c*(f/d)) + f*g*(x^2/d)), x], x, Sqrt[c + d*
x]], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 6839

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
```

```
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$
\begin{aligned}
\int e^{a+bx+cx^2}(b+2cx)\sqrt{a+bx+cx^2}\,dx &= \text{Subst}\left(\int e^x\sqrt{x}\,dx, x, a+bx+cx^2\right)\\
&= e^{a+bx+cx^2}\sqrt{a+bx+cx^2} - \frac{1}{2}\text{Subst}\left(\int \frac{e^x}{\sqrt{x}}\,dx, x, a+bx+cx^2\right)\\
&= e^{a+bx+cx^2}\sqrt{a+bx+cx^2} - \text{Subst}\left(\int e^{x^2}\,dx, x, \sqrt{a+bx+cx^2}\right)\\
&= e^{a+bx+cx^2}\sqrt{a+bx+cx^2} - \frac{1}{2}\sqrt{\pi}\,\text{erfi}\left(\sqrt{a+bx+cx^2}\right)
\end{aligned}
$$

Mathematica [A]
time = 1.78, size = 46, normalized size = 0.88

$$\frac{\sqrt{a+x(b+cx)}\,\Gamma\left(\frac{3}{2}, -a-x(b+cx)\right)}{\sqrt{-a-x(b+cx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x + c*x^2)*(b + 2*c*x)*Sqrt[a + b*x + c*x^2],x]
[Out] (Sqrt[a + x*(b + c*x)]*Gamma[3/2, -a - x*(b + c*x)])/Sqrt[-a - x*(b + c*x)]
```

Maple [A]
time = 0.12, size = 44, normalized size = 0.85

method	result	size
derivativedivides	$-\frac{\text{erfi}\left(\sqrt{c\,x^2+bx+a}\right)\sqrt{\pi}}{2}+\mathrm{e}^{c\,x^2+bx+a}\sqrt{c\,x^2+bx+a}$	44
default	$-\frac{\text{erfi}\left(\sqrt{c\,x^2+bx+a}\right)\sqrt{\pi}}{2}+\mathrm{e}^{c\,x^2+bx+a}\sqrt{c\,x^2+bx+a}$	44

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(1/2),x,method=_RETURNVERBOSE)
[Out] -1/2*erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)+exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(1/2
)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(1/2),x, algorithm="maxi
ma")
```

```
[Out] integrate(sqrt(c*x^2 + b*x + a)*(2*c*x + b)*e^(c*x^2 + b*x + a), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(1/2),x, algorithm="fric
as")
```

```
[Out] integral(sqrt(c*x^2 + b*x + a)*(2*c*x + b)*e^(c*x^2 + b*x + a), x)
```

Sympy [A]
time = 2.69, size = 78, normalized size = 1.50

$$\frac{\left(\sqrt{-a-bx-cx^2}\,e^{a+bx+cx^2}+\frac{\sqrt{\pi}\operatorname{erfc}\left(\sqrt{-a-bx-cx^2}\right)}{2}\right)\sqrt{a+bx+cx^2}}{\sqrt{-a-bx-cx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)*(c*x**2+b*x+a)**(1/2),x)
```

```
[Out] (sqrt(-a - b*x - c*x**2)*exp(a + b*x + c*x**2) + sqrt(pi)*erfc(sqrt(-a - b*
x - c*x**2))/2)*sqrt(a + b*x + c*x**2)/sqrt(-a - b*x - c*x**2)
```

Giac [C] Result contains complex when optimal does not.
time = 2.83, size = 45, normalized size = 0.87

$$-\frac{1}{2}i\sqrt{\pi}\operatorname{erf}\left(-i\sqrt{cx^2+bx+a}\right)+\sqrt{cx^2+bx+a}\,e^{(cx^2+bx+a)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(1/2),x, algorithm="giac
")
```

```
[Out] -1/2*I*sqrt(pi)*erf(-I*sqrt(c*x^2 + b*x + a)) + sqrt(c*x^2 + b*x + a)*e^(c*
x^2 + b*x + a)
```

Mupad [B]
time = 3.51, size = 76, normalized size = 1.46

$$\frac{\sqrt{\pi}\operatorname{erfc}\left(\sqrt{-c\,x^2-b\,x-a}\right)\sqrt{c\,x^2+b\,x+a}}{2\sqrt{-c\,x^2-b\,x-a}}+\mathrm{e}^{b\,x}\,\mathrm{e}^{a}\,\mathrm{e}^{c\,x^2}\,\sqrt{c\,x^2+b\,x+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^(1/2),x)
```

```
[Out] (pi^(1/2)*erfc((- a - b*x - c*x^2)^(1/2))*(a + b*x + c*x^2)^(1/2))/(2*(- a
- b*x - c*x^2)^(1/2)) + exp(b*x)*exp(a)*exp(c*x^2)*(a + b*x + c*x^2)^(1/2)
```

3.631 $\int \frac{e^{a+bx+cx^2}(b+2cx)}{\sqrt{a+bx+cx^2}}\,dx$

Optimal. Leaf size=21

$$\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{a+bx+cx^2}\right)$$

```
[Out] erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)
```

Rubi [A]
time = 0.18, antiderivative size = 21, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {6839, 2211, 2235}

$$\sqrt{\pi}\,\mathrm{Erfi}\left(\sqrt{a+bx+cx^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[(E^(a + b*x + c*x^2)*(b + 2*c*x))/Sqrt[a + b*x + c*x^2],x]
```

```
[Out] Sqrt[Pi]*Erfi[Sqrt[a + b*x + c*x^2]]
```

Rule 2211

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :
> Dist[2/d, Subst[Int[F^(g*(e - c*(f/d)) + f*g*(x^2/d)), x], x, Sqrt[c + d*
x]], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 6839

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\int \frac{e^{a+bx+cx^2}(b+2cx)}{\sqrt{a+bx+cx^2}}\,dx = \text{Subst}\left(\int \frac{e^x}{\sqrt{x}}\,dx, x, a+bx+cx^2\right)$$
$$= 2\text{Subst}\left(\int e^{x^2}\,dx, x, \sqrt{a+bx+cx^2}\right)$$
$$= \sqrt{\pi}\,\text{erfi}\left(\sqrt{a+bx+cx^2}\right)$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 46 vs. 2(21) = 42.
time = 1.84, size = 46, normalized size = 2.19

$$\frac{\sqrt{-a-x(b+cx)}\,\Gamma\left(\frac{1}{2},-a-x(b+cx)\right)}{\sqrt{a+x(b+cx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(a + b*x + c*x^2)*(b + 2*c*x))/Sqrt[a + b*x + c*x^2],x]
[Out] (Sqrt[-a - x*(b + c*x)]*Gamma[1/2, -a - x*(b + c*x)])/Sqrt[a + x*(b + c*x)]
```

Maple [A]
time = 0.10, size = 18, normalized size = 0.86

method	result	size
derivativedivides	$\text{erfi}\left(\sqrt{c\,x^{2}+bx+a}\right)\sqrt{\pi}$	18
default	$\text{erfi}\left(\sqrt{c\,x^{2}+bx+a}\right)\sqrt{\pi}$	18

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(1/2),x,method=_RETURNVERBOSE)
[Out] erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(1/2),x, algorithm="maxi
ma")
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/sqrt(c*x^2 + b*x + a), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(1/2),x, algorithm="fric
as")
```

```
[Out] integral((2*c*x + b)*e^(c*x^2 + b*x + a)/sqrt(c*x^2 + b*x + a), x)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 49 vs. $2(19) = 38$.
time = 2.06, size = 49, normalized size = 2.33

$$\frac{\sqrt{\pi}\sqrt{-a-bx-cx^2}\operatorname{erfc}\left(\sqrt{-a-bx-cx^2}\right)}{\sqrt{a+bx+cx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)/(c*x**2+b*x+a)**(1/2),x)
```

```
[Out] sqrt(pi)*sqrt(-a - b*x - c*x**2)*erfc(sqrt(-a - b*x - c*x**2))/sqrt(a + b*x
 + c*x**2)
```

Giac [C] Result contains complex when optimal does not.
time = 2.46, size = 20, normalized size = 0.95

$$i\sqrt{\pi}\operatorname{erf}\left(-i\sqrt{cx^2+bx+a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(1/2),x, algorithm="giac
")
```

```
[Out] I*sqrt(pi)*erf(-I*sqrt(c*x^2 + b*x + a))
```

Mupad [B]
time = 3.90, size = 49, normalized size = 2.33

$$\frac{\sqrt{\pi}\operatorname{erfc}\left(\sqrt{-c\,x^2-b\,x-a}\right)\sqrt{-c\,x^2-b\,x-a}}{\sqrt{c\,x^2+b\,x+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(1/2),x)
```

```
[Out] (pi^(1/2)*erfc((- a - b*x - c*x^2)^(1/2))*(- a - b*x - c*x^2)^(1/2))/(a + b
*x + c*x^2)^(1/2)
```

3.632 $\int \frac{e^{a+bx+cx^2}(b+2cx)}{(a+bx+cx^2)^{3/2}}\,dx$

Optimal. Leaf size=51

$$-\frac{2e^{a+bx+cx^2}}{\sqrt{a+bx+cx^2}}+2\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{a+bx+cx^2}\right)$$

```
[Out] 2*erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)-2*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(1/2)
```

Rubi [A]
time = 0.21, antiderivative size = 51, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.121$, Rules used = {6839, 2208, 2211, 2235}

$$2\sqrt{\pi}\,\mathrm{Erfi}\left(\sqrt{a+bx+cx^2}\right)-\frac{2e^{a+bx+cx^2}}{\sqrt{a+bx+cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(3/2),x]
```

```
[Out] (-2*E^(a + b*x + c*x^2))/Sqrt[a + b*x + c*x^2] + 2*Sqrt[Pi]*Erfi[Sqrt[a + b
*x + c*x^2]]
```

Rule 2208

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_), x_Symbol] :> Simp[(c + d*x)^(m + 1)*((b*F^(g*(e + f*x)))^n/(d*(m + 1)))
, x] - Dist[f*g*n*(Log[F]/(d*(m + 1))), Int[(c + d*x)^(m + 1)*(b*F^(g*(e +
f*x)))^n, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && LtQ[m, -1] && Int
egerQ[2*m] &&  !TrueQ[$UseGamma]
```

Rule 2211

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :
> Dist[2/d, Subst[Int[F^(g*(e - c*(f/d)) + f*g*(x^2/d)), x], x, Sqrt[c + d*
x]], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 6839

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\begin{aligned}
\int \frac{e^{a+bx+cx^2}(b+2cx)}{(a+bx+cx^2)^{3/2}}\,dx &= \text{Subst}\left(\int \frac{e^x}{x^{3/2}}\,dx, x, a+bx+cx^2\right)\\
&= -\frac{2e^{a+bx+cx^2}}{\sqrt{a+bx+cx^2}} + 2\text{Subst}\left(\int \frac{e^x}{\sqrt{x}}\,dx, x, a+bx+cx^2\right)\\
&= -\frac{2e^{a+bx+cx^2}}{\sqrt{a+bx+cx^2}} + 4\text{Subst}\left(\int e^{x^2}\,dx, x, \sqrt{a+bx+cx^2}\right)\\
&= -\frac{2e^{a+bx+cx^2}}{\sqrt{a+bx+cx^2}} + 2\sqrt{\pi}\,\text{erfi}\left(\sqrt{a+bx+cx^2}\right)
\end{aligned}$$

Mathematica [A]
time = 1.95, size = 62, normalized size = 1.22

$$\frac{-2e^{a+x(b+cx)}+2\sqrt{-a-x(b+cx)}\,\Gamma\left(\frac{1}{2},-a-x(b+cx)\right)}{\sqrt{a+x(b+cx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(3/2),x]
```

```
[Out] (-2*E^(a + x*(b + c*x)) + 2*Sqrt[-a - x*(b + c*x)]*Gamma[1/2, -a - x*(b + c
*x)])/Sqrt[a + x*(b + c*x)]
```

Maple [A]
time = 0.10, size = 45, normalized size = 0.88

method	result	size
derivativedivides	$2\,\text{erfi}\left(\sqrt{c\,x^2+bx+a}\right)\sqrt{\pi}-\frac{2\,\mathrm{e}^{c\,x^2+bx+a}}{\sqrt{c\,x^2+bx+a}}$	45
default	$2\,\text{erfi}\left(\sqrt{c\,x^2+bx+a}\right)\sqrt{\pi}-\frac{2\,\mathrm{e}^{c\,x^2+bx+a}}{\sqrt{c\,x^2+bx+a}}$	45

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(3/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2*erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)-2*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(1/2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(3/2),x, algorithm="maxi
ma")
```

```
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a)^(3/2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(3/2),x, algorithm="fric
as")
```

```
[Out] integral(sqrt(c*x^2 + b*x + a)*(2*c*x + b)*e^(c*x^2 + b*x + a)/(c^2*x^4 + 2
*b*c*x^3 + 2*a*b*x + (b^2 + 2*a*c)*x^2 + a^2), x)
```

Sympy [A]
time = 3.21, size = 80, normalized size = 1.57

$$\frac{\left(-2\sqrt{\pi}\operatorname{erfc}\left(\sqrt{-a-bx-cx^2}\right)+\frac{2e^{a+bx+cx^2}}{\sqrt{-a-bx-cx^2}}\right)\left(-a-bx-cx^2\right)^{\frac{3}{2}}}{\left(a+bx+cx^2\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)/(c*x**2+b*x+a)**(3/2),x)
```

```
[Out] (-2*sqrt(pi)*erfc(sqrt(-a - b*x - c*x**2)) + 2*exp(a + b*x + c*x**2)/sqrt(-
a - b*x - c*x**2))*(-a - b*x - c*x**2)**(3/2)/(a + b*x + c*x**2)**(3/2)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(3/2),x, algorithm="giac
")
```

```
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a)^(3/2), x)
```

Mupad [B]
time = 4.00, size = 79, normalized size = 1.55

$$-\frac{e^{c\,x^2+b\,x+a}\,\left(2\,c\,x^2+2\,b\,x+2\,a\right)+2\,\sqrt{\pi }\,\mathrm{erfc}\left(\sqrt{-c\,x^2-b\,x-a}\right)\,{\left(-c\,x^2-b\,x-a\right)}^{3/2}}{{\left(c\,x^2+b\,x+a\right)}^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(3/2),x)
```

```
[Out] -(exp(a + b*x + c*x^2)*(2*a + 2*b*x + 2*c*x^2) + 2*pi^(1/2)*erfc((- a - b*x
 - c*x^2)^(1/2))*(- a - b*x - c*x^2)^(3/2))/(a + b*x + c*x^2)^(3/2)
```

3.633 $\int \frac{e^{a+bx+cx^2}(b+2cx)}{\left(a+bx+cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=85

$$-\frac{2e^{a+bx+cx^2}}{3\left(a+bx+cx^2\right)^{3/2}}-\frac{4e^{a+bx+cx^2}}{3\sqrt{a+bx+cx^2}}+\frac{4}{3}\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{a+bx+cx^2}\right)$$

```
[Out] -2/3*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(3/2)+4/3*erfi((c*x^2+b*x+a)^(1/2))*Pi^
(1/2)-4/3*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(1/2)
```

Rubi [A]
time = 0.24, antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.121$, Rules used = {6839, 2208, 2211, 2235}

$$\frac{4}{3}\sqrt{\pi}\,\mathrm{Erfi}\left(\sqrt{a+bx+cx^2}\right)-\frac{4e^{a+bx+cx^2}}{3\sqrt{a+bx+cx^2}}-\frac{2e^{a+bx+cx^2}}{3\left(a+bx+cx^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(5/2),x]
```

```
[Out] (-2*E^(a + b*x + c*x^2))/(3*(a + b*x + c*x^2)^(3/2)) - (4*E^(a + b*x + c*x^
2))/(3*Sqrt[a + b*x + c*x^2]) + (4*Sqrt[Pi]*Erfi[Sqrt[a + b*x + c*x^2]])/3
```

Rule 2208

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_), x_Symbol] :> Simp[(c + d*x)^(m + 1)*((b*F^(g*(e + f*x)))^n/(d*(m + 1)))
, x] - Dist[f*g*n*(Log[F]/(d*(m + 1))), Int[(c + d*x)^(m + 1)*(b*F^(g*(e +
f*x)))^n, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && LtQ[m, -1] && Int
egerQ[2*m] &&  !TrueQ[$UseGamma]
```

Rule 2211

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :
> Dist[2/d, Subst[Int[F^(g*(e - c*(f/d)) + f*g*(x^2/d)), x], x, Sqrt[c + d*
x]], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 6839

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\begin{aligned}
\int \frac{e^{a+bx+cx^2}(b+2cx)}{(a+bx+cx^2)^{5/2}}\,dx &= \text{Subst}\left(\int \frac{e^x}{x^{5/2}}\,dx, x, a+bx+cx^2\right)\\
&= -\frac{2e^{a+bx+cx^2}}{3\,(a+bx+cx^2)^{3/2}}+\frac{2}{3}\text{Subst}\left(\int \frac{e^x}{x^{3/2}}\,dx, x, a+bx+cx^2\right)\\
&= -\frac{2e^{a+bx+cx^2}}{3\,(a+bx+cx^2)^{3/2}}-\frac{4e^{a+bx+cx^2}}{3\sqrt{a+bx+cx^2}}+\frac{4}{3}\text{Subst}\left(\int \frac{e^x}{\sqrt{x}}\,dx, x, a+bx+cx^2\right)\\
&= -\frac{2e^{a+bx+cx^2}}{3\,(a+bx+cx^2)^{3/2}}-\frac{4e^{a+bx+cx^2}}{3\sqrt{a+bx+cx^2}}+\frac{8}{3}\text{Subst}\left(\int e^{x^2}\,dx, x, \sqrt{a+bx+cx^2}\right)\\
&= -\frac{2e^{a+bx+cx^2}}{3\,(a+bx+cx^2)^{3/2}}-\frac{4e^{a+bx+cx^2}}{3\sqrt{a+bx+cx^2}}+\frac{4}{3}\sqrt{\pi}\,\text{erfi}\left(\sqrt{a+bx+cx^2}\right)
\end{aligned}$$

Mathematica [A]
time = 3.24, size = 77, normalized size = 0.91

$$-\frac{2\left(e^{a+x(b+cx)}(1+2(a+x(b+cx)))+2(-a-x(b+cx))^{3/2}\Gamma\left(\frac{1}{2},-a-x(b+cx)\right)\right)}{3(a+x(b+cx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(5/2),x]
[Out] (-2*(E^(a + x*(b + c*x))*(1 + 2*(a + x*(b + c*x))) + 2*(-a - x*(b + c*x))^(
3/2)*Gamma[1/2, -a - x*(b + c*x)]))/(3*(a + x*(b + c*x))^(3/2))
```

Maple [A]
time = 0.10, size = 70, normalized size = 0.82

method	result	size
derivativedivides	$-\frac{2\,e^{c\,x^2+bx+a}}{3(c\,x^2+bx+a)^{\frac{3}{2}}}+\frac{4\,\text{erfi}\left(\sqrt{c\,x^2+bx+a}\right)\sqrt{\pi}}{3}-\frac{4\,e^{c\,x^2+bx+a}}{3\sqrt{c\,x^2+bx+a}}$	70
default	$-\frac{2\,e^{c\,x^2+bx+a}}{3(c\,x^2+bx+a)^{\frac{3}{2}}}+\frac{4\,\text{erfi}\left(\sqrt{c\,x^2+bx+a}\right)\sqrt{\pi}}{3}-\frac{4\,e^{c\,x^2+bx+a}}{3\sqrt{c\,x^2+bx+a}}$	70

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/3*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(3/2)+4/3*erfi((c*x^2+b*x+a)^(1/2))*Pi^
(1/2)-4/3*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(1/2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(5/2),x, algorithm="maxi
ma")
```

```
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a)^(5/2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(5/2),x, algorithm="fric
as")
```

```
[Out] integral(sqrt(c*x^2 + b*x + a)*(2*c*x + b)*e^(c*x^2 + b*x + a)/(c^3*x^6 + 3
*b*c^2*x^5 + 3*(b^2*c + a*c^2)*x^4 + 3*a^2*b*x + (b^3 + 6*a*b*c)*x^3 + a^3
+ 3*(a*b^2 + a^2*c)*x^2), x)
```

Sympy [A]
time = 21.02, size = 105, normalized size = 1.24

$$\frac{\left(\frac{4\sqrt{\pi}\,\operatorname{erfc}\left(\sqrt{-a-bx-cx^2}\right)}{3}-\frac{\left(-\frac{4a}{3}-\frac{4bx}{3}-\frac{4cx^2}{3}-\frac{2}{3}\right)e^{a+bx+cx^2}}{\left(-a-bx-cx^2\right)^{\frac{3}{2}}}\right)\left(-a-bx-cx^2\right)^{\frac{5}{2}}}{\left(a+bx+cx^2\right)^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)/(c*x**2+b*x+a)**(5/2),x)
```

```
[Out] (4*sqrt(pi)*erfc(sqrt(-a - b*x - c*x**2))/3 - (-4*a/3 - 4*b*x/3 - 4*c*x**2/
3 - 2/3)*exp(a + b*x + c*x**2)/(-a - b*x - c*x**2)**(3/2))*(-a - b*x - c*x*
*2)**(5/2)/(a + b*x + c*x**2)**(5/2)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

$$\text{could not integrate}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(5/2),x, algorithm="giac
")
```

```
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a)^(5/2), x)
```

Mupad [B]
time = 4.20, size = 104, normalized size = 1.22

$$-\frac{e^{c\,x^2+b\,x+a}\,\left(2\,c\,x^2+2\,b\,x+2\,a\right)+4\,e^{c\,x^2+b\,x+a}\,{\left(c\,x^2+b\,x+a\right)}^2-4\,\sqrt{\pi }\,\mathrm{erfc}\left(\sqrt{-c\,x^2-b\,x-a}\right)\,{\left(-c\,x^2-b\,x-a\right)}^{5/2}}{3\,{\left(c\,x^2+b\,x+a\right)}^{5/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(5/2),x)
```

```
[Out] -(exp(a + b*x + c*x^2)*(2*a + 2*b*x + 2*c*x^2) + 4*exp(a + b*x + c*x^2)*(a
+ b*x + c*x^2)^2 - 4*pi^(1/2)*erfc((- a - b*x - c*x^2)^(1/2))*(- a - b*x -
c*x^2)^(5/2))/(3*(a + b*x + c*x^2)^(5/2))
```

3.634 $\int \frac{e^{a+bx+cx^2}(b+2cx)}{(a+bx+cx^2)^{7/2}}\,dx$

Optimal. Leaf size=115

$$-\frac{2e^{a+bx+cx^2}}{5\left(a+bx+cx^2\right)^{5/2}}-\frac{4e^{a+bx+cx^2}}{15\left(a+bx+cx^2\right)^{3/2}}-\frac{8e^{a+bx+cx^2}}{15\sqrt{a+bx+cx^2}}+\frac{8}{15}\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{a+bx+cx^2}\right)$$

```
[Out] -2/5*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(5/2)-4/15*exp(c*x^2+b*x+a)/(c*x^2+b*x+
a)^(3/2)+8/15*erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)-8/15*exp(c*x^2+b*x+a)/(c*x
^2+b*x+a)^(1/2)
```

Rubi [A]
time = 0.24, antiderivative size = 115, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.121$, Rules used = {6839, 2208, 2211, 2235}

$$\frac{8}{15}\sqrt{\pi}\,\mathrm{Erfi}\left(\sqrt{a+bx+cx^2}\right)-\frac{8e^{a+bx+cx^2}}{15\sqrt{a+bx+cx^2}}-\frac{4e^{a+bx+cx^2}}{15\left(a+bx+cx^2\right)^{3/2}}-\frac{2e^{a+bx+cx^2}}{5\left(a+bx+cx^2\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(7/2),x]
```

```
[Out] (-2*E^(a + b*x + c*x^2))/(5*(a + b*x + c*x^2)^(5/2)) - (4*E^(a + b*x + c*x^
2))/(15*(a + b*x + c*x^2)^(3/2)) - (8*E^(a + b*x + c*x^2))/(15*Sqrt[a + b*x
 + c*x^2]) + (8*Sqrt[Pi]*Erfi[Sqrt[a + b*x + c*x^2]])/15
```

Rule 2208

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_), x_Symbol] :> Simp[(c + d*x)^(m + 1)*((b*F^(g*(e + f*x)))^n/(d*(m + 1)))
, x] - Dist[f*g*n*(Log[F]/(d*(m + 1))), Int[(c + d*x)^(m + 1)*(b*F^(g*(e +
f*x)))^n, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && LtQ[m, -1] && Int
egerQ[2*m] &&  !TrueQ[$UseGamma]
```

Rule 2211

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :
> Dist[2/d, Subst[Int[F^(g*(e - c*(f/d)) + f*g*(x^2/d)), x], x, Sqrt[c + d*
x]], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
```

```
F, a, b, c, d}, x] && PosQ[b]
```

Rule 6839

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\int \frac{e^{a+bx+cx^2}(b+2cx)}{(a+bx+cx^2)^{7/2}}\,dx = \text{Subst}\left(\int \frac{e^x}{x^{7/2}}\,dx, x, a+bx+cx^2\right)$$
$$= -\frac{2e^{a+bx+cx^2}}{5\,(a+bx+cx^2)^{5/2}} + \frac{2}{5}\text{Subst}\left(\int \frac{e^x}{x^{5/2}}\,dx, x, a+bx+cx^2\right)$$
$$= -\frac{2e^{a+bx+cx^2}}{5\,(a+bx+cx^2)^{5/2}} - \frac{4e^{a+bx+cx^2}}{15\,(a+bx+cx^2)^{3/2}} + \frac{4}{15}\text{Subst}\left(\int \frac{e^x}{x^{3/2}}\,dx, x, a+bx+\right.$$
$$= -\frac{2e^{a+bx+cx^2}}{5\,(a+bx+cx^2)^{5/2}} - \frac{4e^{a+bx+cx^2}}{15\,(a+bx+cx^2)^{3/2}} - \frac{8e^{a+bx+cx^2}}{15\sqrt{a+bx+cx^2}} + \frac{8}{15}\text{Subst}\left(\int\right.$$
$$= -\frac{2e^{a+bx+cx^2}}{5\,(a+bx+cx^2)^{5/2}} - \frac{4e^{a+bx+cx^2}}{15\,(a+bx+cx^2)^{3/2}} - \frac{8e^{a+bx+cx^2}}{15\sqrt{a+bx+cx^2}} + \frac{16}{15}\text{Subst}\left(\int\right.$$
$$= -\frac{2e^{a+bx+cx^2}}{5\,(a+bx+cx^2)^{5/2}} - \frac{4e^{a+bx+cx^2}}{15\,(a+bx+cx^2)^{3/2}} - \frac{8e^{a+bx+cx^2}}{15\sqrt{a+bx+cx^2}} + \frac{8}{15}\sqrt{\pi}\,\text{erfi}\left(\right.$$

Mathematica [A]
time = 4.91, size = 91, normalized size = 0.79

$$\frac{-2e^{a+x(b+cx)}(3+2(a+x(b+cx))+4(a+x(b+cx))^2)+8(-a-x(b+cx))^{5/2}\Gamma\left(\frac{1}{2},-a-x(b+cx)\right)}{15(a+x(b+cx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(7/2),x]
[Out] (-2*E^(a + x*(b + c*x))*(3 + 2*(a + x*(b + c*x)) + 4*(a + x*(b + c*x))^2) +
 8*(-a - x*(b + c*x))^(5/2)*Gamma[1/2, -a - x*(b + c*x)])/(15*(a + x*(b + c
*x))^(5/2))
```

Maple [A]
time = 0.10, size = 95, normalized size = 0.83

method	result	size
derivativedivides	$-\frac{2\,\mathrm{e}^{c\,x^2+bx+a}}{5(c\,x^2+bx+a)^{\frac{5}{2}}}-\frac{4\,\mathrm{e}^{c\,x^2+bx+a}}{15(c\,x^2+bx+a)^{\frac{3}{2}}}+\frac{8\,\mathrm{erfi}\left(\sqrt{c\,x^2+bx+a}\right)\sqrt{\pi}}{15}-\frac{8\,\mathrm{e}^{c\,x^2+bx+a}}{15\sqrt{c\,x^2+bx+a}}$	95
default	$-\frac{2\,\mathrm{e}^{c\,x^2+bx+a}}{5(c\,x^2+bx+a)^{\frac{5}{2}}}-\frac{4\,\mathrm{e}^{c\,x^2+bx+a}}{15(c\,x^2+bx+a)^{\frac{3}{2}}}+\frac{8\,\mathrm{erfi}\left(\sqrt{c\,x^2+bx+a}\right)\sqrt{\pi}}{15}-\frac{8\,\mathrm{e}^{c\,x^2+bx+a}}{15\sqrt{c\,x^2+bx+a}}$	95

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(7/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/5*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(5/2)-4/15*exp(c*x^2+b*x+a)/(c*x^2+b*x+
a)^(3/2)+8/15*erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)-8/15*exp(c*x^2+b*x+a)/(c*x
^2+b*x+a)^(1/2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(7/2),x, algorithm="maxi
ma")
```

```
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a)^(7/2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(7/2),x, algorithm="fric
as")
```

```
[Out] integral(sqrt(c*x^2 + b*x + a)*(2*c*x + b)*e^(c*x^2 + b*x + a)/(c^4*x^8 + 4
*b*c^3*x^7 + 2*(3*b^2*c^2 + 2*a*c^3)*x^6 + 4*(b^3*c + 3*a*b*c^2)*x^5 + 4*a^
3*b*x + (b^4 + 12*a*b^2*c + 6*a^2*c^2)*x^4 + a^4 + 4*(a*b^3 + 3*a^2*b*c)*x^
3 + 2*(3*a^2*b^2 + 2*a^3*c)*x^2), x)
```

Sympy [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: SystemError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)/(c*x**2+b*x+a)**(7/2),x)
```

```
[Out] Exception raised: SystemError >> excessive stack use: stack is 4369 deep
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(7/2),x, algorithm="giac
")
```

```
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a)^(7/2), x)
```

Mupad [B]
time = 4.66, size = 129, normalized size = 1.12

$$-\frac{\mathrm{e}^{c\,x^2+b\,x+a}\,\left(6\,c\,x^2+6\,b\,x+6\,a\right)+4\,\mathrm{e}^{c\,x^2+b\,x+a}\,{\left(c\,x^2+b\,x+a\right)}^2+8\,\mathrm{e}^{c\,x^2+b\,x+a}\,{\left(c\,x^2+b\,x+a\right)}^3+8\,\sqrt{\pi }\,\mathrm{erfc}\left(\sqrt{-c\,x^2-b\,x-a}\right)\,{\left(-c\,x^2-b\,x-a\right)}^{7/2}}{15\,{\left(c\,x^2+b\,x+a\right)}^{7/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(7/2),x)
```

```
[Out] -(exp(a + b*x + c*x^2)*(6*a + 6*b*x + 6*c*x^2) + 4*exp(a + b*x + c*x^2)*(a
+ b*x + c*x^2)^2 + 8*exp(a + b*x + c*x^2)*(a + b*x + c*x^2)^3 + 8*pi^(1/2)*
erfc((- a - b*x - c*x^2)^(1/2))*(- a - b*x - c*x^2)^(7/2))/(15*(a + b*x + c
*x^2)^(7/2))
```

3.635 $\int \frac{e^{a+bx+cx^2}(b+2cx)}{(a+bx+cx^2)^{9/2}}\,dx$

Optimal. Leaf size=145

$$-\frac{2e^{a+bx+cx^2}}{7\left(a+bx+cx^2\right)^{7/2}}-\frac{4e^{a+bx+cx^2}}{35\left(a+bx+cx^2\right)^{5/2}}-\frac{8e^{a+bx+cx^2}}{105\left(a+bx+cx^2\right)^{3/2}}-\frac{16e^{a+bx+cx^2}}{105\sqrt{a+bx+cx^2}}+\frac{16}{105}\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{a\right.$$

```
[Out] -2/7*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(7/2)-4/35*exp(c*x^2+b*x+a)/(c*x^2+b*x+
a)^(5/2)-8/105*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(3/2)+16/105*erfi((c*x^2+b*x+
a)^(1/2))*Pi^(1/2)-16/105*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(1/2)
```

Rubi [A]
time = 0.26, antiderivative size = 145, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.121$, Rules used = {6839, 2208, 2211, 2235}

$$\frac{16}{105}\sqrt{\pi}\,\mathrm{Erfi}\left(\sqrt{a+bx+cx^2}\right)-\frac{16e^{a+bx+cx^2}}{105\sqrt{a+bx+cx^2}}-\frac{8e^{a+bx+cx^2}}{105\left(a+bx+cx^2\right)^{3/2}}-\frac{4e^{a+bx+cx^2}}{35\left(a+bx+cx^2\right)^{5/2}}-\frac{2e^{a+bx+cx^2}}{7\left(a+bx+cx^2\right)^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(9/2),x]
```

```
[Out] (-2*E^(a + b*x + c*x^2))/(7*(a + b*x + c*x^2)^(7/2)) - (4*E^(a + b*x + c*x^
2))/(35*(a + b*x + c*x^2)^(5/2)) - (8*E^(a + b*x + c*x^2))/(105*(a + b*x +
c*x^2)^(3/2)) - (16*E^(a + b*x + c*x^2))/(105*Sqrt[a + b*x + c*x^2]) + (16*
Sqrt[Pi]*Erfi[Sqrt[a + b*x + c*x^2]])/105
```

Rule 2208

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_), x_Symbol] :> Simp[(c + d*x)^(m + 1)*((b*F^(g*(e + f*x)))^n/(d*(m + 1)))
, x] - Dist[f*g*n*(Log[F]/(d*(m + 1))), Int[(c + d*x)^(m + 1)*(b*F^(g*(e +
f*x)))^n, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && LtQ[m, -1] && Int
egerQ[2*m] &&  !TrueQ[$UseGamma]
```

Rule 2211

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :
> Dist[2/d, Subst[Int[F^(g*(e - c*(f/d)) + f*g*(x^2/d)), x], x, Sqrt[c + d*
x]], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
```

```
F, a, b, c, d}, x] && PosQ[b]
```

Rule 6839

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\int \frac{e^{a+bx+cx^2}(b+2cx)}{(a+bx+cx^2)^{9/2}}\,dx = \text{Subst}\left(\int \frac{e^x}{x^{9/2}}\,dx, x, a+bx+cx^2\right)$$
$$= -\frac{2e^{a+bx+cx^2}}{7(a+bx+cx^2)^{7/2}} + \frac{2}{7}\text{Subst}\left(\int \frac{e^x}{x^{7/2}}\,dx, x, a+bx+cx^2\right)$$
$$= -\frac{2e^{a+bx+cx^2}}{7(a+bx+cx^2)^{7/2}} - \frac{4e^{a+bx+cx^2}}{35(a+bx+cx^2)^{5/2}} + \frac{4}{35}\text{Subst}\left(\int \frac{e^x}{x^{5/2}}\,dx, x, a+bx+\right.$$
$$= -\frac{2e^{a+bx+cx^2}}{7(a+bx+cx^2)^{7/2}} - \frac{4e^{a+bx+cx^2}}{35(a+bx+cx^2)^{5/2}} - \frac{8e^{a+bx+cx^2}}{105(a+bx+cx^2)^{3/2}} + \frac{8}{105}\text{Subs}$$
$$= -\frac{2e^{a+bx+cx^2}}{7(a+bx+cx^2)^{7/2}} - \frac{4e^{a+bx+cx^2}}{35(a+bx+cx^2)^{5/2}} - \frac{8e^{a+bx+cx^2}}{105(a+bx+cx^2)^{3/2}} - \frac{16e^{a}}{105\sqrt{a+}}$$
$$= -\frac{2e^{a+bx+cx^2}}{7(a+bx+cx^2)^{7/2}} - \frac{4e^{a+bx+cx^2}}{35(a+bx+cx^2)^{5/2}} - \frac{8e^{a+bx+cx^2}}{105(a+bx+cx^2)^{3/2}} - \frac{16e^{a}}{105\sqrt{a+}}$$
$$= -\frac{2e^{a+bx+cx^2}}{7(a+bx+cx^2)^{7/2}} - \frac{4e^{a+bx+cx^2}}{35(a+bx+cx^2)^{5/2}} - \frac{8e^{a+bx+cx^2}}{105(a+bx+cx^2)^{3/2}} - \frac{16e^{a}}{105\sqrt{a+}}$$

Mathematica [A]
time = 5.95, size = 103, normalized size = 0.71

$$-\frac{2\left(e^{a+x(b+cx)}(15+6(a+x(b+cx))+4(a+x(b+cx))^2+8(a+x(b+cx))^3)+8(-a-x(b+cx))^{7/2}\Gamma\left(\frac{1}{2},-a-x(b+cx)\right)\right)}{105(a+x(b+cx))^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(9/2),x]
```

```
[Out] (-2*(E^(a + x*(b + c*x))*(15 + 6*(a + x*(b + c*x)) + 4*(a + x*(b + c*x))^2
+ 8*(a + x*(b + c*x))^3) + 8*(-a - x*(b + c*x))^(7/2)*Gamma[1/2, -a - x*(b
+ c*x)]))/(105*(a + x*(b + c*x))^(7/2))
```

Maple [A]
time = 0.11, size = 120, normalized size = 0.83

method	result
derivativedivides	$-\frac{2\,\mathrm{e}^{c\,x^2+bx+a}}{7(c\,x^2+bx+a)^{\frac{7}{2}}}-\frac{4\,\mathrm{e}^{c\,x^2+bx+a}}{35(c\,x^2+bx+a)^{\frac{5}{2}}}-\frac{8\,\mathrm{e}^{c\,x^2+bx+a}}{105(c\,x^2+bx+a)^{\frac{3}{2}}}+\frac{16\,\mathrm{erfi}\left(\sqrt{c\,x^2+bx+a}\right)\sqrt{\pi}}{105}-\frac{16}{105\sqrt{c}}$
default	$-\frac{2\,\mathrm{e}^{c\,x^2+bx+a}}{7(c\,x^2+bx+a)^{\frac{7}{2}}}-\frac{4\,\mathrm{e}^{c\,x^2+bx+a}}{35(c\,x^2+bx+a)^{\frac{5}{2}}}-\frac{8\,\mathrm{e}^{c\,x^2+bx+a}}{105(c\,x^2+bx+a)^{\frac{3}{2}}}+\frac{16\,\mathrm{erfi}\left(\sqrt{c\,x^2+bx+a}\right)\sqrt{\pi}}{105}-\frac{16}{105\sqrt{c}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(9/2),x,method=_RETURNVERBOSE)
```

```
[Out] -2/7*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(7/2)-4/35*exp(c*x^2+b*x+a)/(c*x^2+b*x+
a)^(5/2)-8/105*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(3/2)+16/105*erfi((c*x^2+b*x+
a)^(1/2))*Pi^(1/2)-16/105*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(1/2)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(9/2),x, algorithm="maxi
ma")
```

```
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a)^(9/2), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(9/2),x, algorithm="fric
as")
```

```
[Out] integral(sqrt(c*x^2 + b*x + a)*(2*c*x + b)*e^(c*x^2 + b*x + a)/(c^5*x^10 +
5*b*c^4*x^9 + 5*(2*b^2*c^3 + a*c^4)*x^8 + 10*(b^3*c^2 + 2*a*b*c^3)*x^7 + 5*
(b^4*c + 6*a*b^2*c^2 + 2*a^2*c^3)*x^6 + 5*a^4*b*x + (b^5 + 20*a*b^3*c + 30*
a^2*b*c^2)*x^5 + a^5 + 5*(a*b^4 + 6*a^2*b^2*c + 2*a^3*c^2)*x^4 + 10*(a^2*b^
3 + 2*a^3*b*c)*x^3 + 5*(2*a^3*b^2 + a^4*c)*x^2), x)
```

Sympy [F(-1)] Timed out
time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)/(c*x**2+b*x+a)**(9/2),x)
```

```
[Out] Timed out
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(9/2),x, algorithm="giac
")
```

```
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a)^(9/2), x)
```

Mupad [B]
time = 5.70, size = 154, normalized size = 1.06

$$-\frac{\mathrm{e}^{c\,x^2+b\,x+a}\,\left(30\,c\,x^2+30\,b\,x+30\,a\right)+12\,\mathrm{e}^{c\,x^2+b\,x+a}\,{\left(c\,x^2+b\,x+a\right)}^2+8\,\mathrm{e}^{c\,x^2+b\,x+a}\,{\left(c\,x^2+b\,x+a\right)}^3+16\,\mathrm{e}^{c\,x^2+b\,x+a}\,{\left(c\,x^2+b\,x+a\right)}^4-16\,\sqrt{\pi}\,\mathrm{erfc}\left(\sqrt{-c\,x^2-b\,x-a}\right)\,{\left(-c\,x^2-b\,x-a\right)}^{9/2}}{105\,{\left(c\,x^2+b\,x+a\right)}^{9/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(9/2),x)
```

```
[Out] -(exp(a + b*x + c*x^2)*(30*a + 30*b*x + 30*c*x^2) + 12*exp(a + b*x + c*x^2)
*(a + b*x + c*x^2)^2 + 8*exp(a + b*x + c*x^2)*(a + b*x + c*x^2)^3 + 16*exp(
a + b*x + c*x^2)*(a + b*x + c*x^2)^4 - 16*pi^(1/2)*erfc((- a - b*x - c*x^2)
^(1/2))*(- a - b*x - c*x^2)^(9/2))/(105*(a + b*x + c*x^2)^(9/2))
```

3.636 $\int \frac{e^{-x}}{\sqrt{1-e^{-2x}}} \, dx$

Optimal. Leaf size=8

$$-\sin^{-1}\left(e^{-x}\right)$$

```
[Out] -arcsin(exp(-x))
```

Rubi [A]
time = 0.02, antiderivative size = 8, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.105$, Rules used = {2281, 222}

$$-\text{ArcSin}\left(e^{-x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[1/(E^x*Sqrt[1 - E^(-2*x)]),x]
```

```
[Out] -ArcSin[E^(-x)]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned} \int \frac{e^{-x}}{\sqrt{1-e^{-2x}}} \, dx &= -\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}} \, dx, x, e^{-x}\right) \\ &= -\sin^{-1}\left(e^{-x}\right) \end{aligned}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 42 vs. 2(8) = 16.
time = 0.03, size = 42, normalized size = 5.25

$$\frac{e^{-x}\sqrt{-1+e^{2x}}\,\tan^{-1}\left(\sqrt{-1+e^{2x}}\right)}{\sqrt{1-e^{-2x}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(E^x*Sqrt[1 - E^(-2*x)]),x]
```

```
[Out] (Sqrt[-1 + E^(2*x)]*ArcTan[Sqrt[-1 + E^(2*x)]])/(E^x*Sqrt[1 - E^(-2*x)])
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 36 vs. $2(7) = 14$.
time = 0.05, size = 37, normalized size = 4.62

method	result	size
default	$-\frac{\mathrm{e}^{-x} \sqrt{-1+\mathrm{e}^{2 x}}\, \arctan\left(\frac{1}{\sqrt{-1+\mathrm{e}^{2 x}}}\right)}{\sqrt{\left(-1+\mathrm{e}^{2 x}\right) \mathrm{e}^{-2 x}}}$	37

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/exp(x)/(1-1/exp(2*x))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/((exp(x)^2-1)/exp(x)^2)^(1/2)/exp(x)*(exp(x)^2-1)^(1/2)*arctan(1/(exp(x)
^2-1)^(1/2))
```

Maxima [A]
time = 0.47, size = 14, normalized size = 1.75

$$\arctan\left(\sqrt{-e^{(-2\,x)}+1}\,e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(x)/(1-1/exp(2*x))^(1/2),x, algorithm="maxima")
```

```
[Out] arctan(sqrt(-e^(-2*x) + 1)*e^x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 18 vs. $2(7) = 14$.
time = 0.41, size = 18, normalized size = 2.25

$$2\,\arctan\left(\left(\sqrt{-e^{(-2\,x)}+1}-1\right)e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(x)/(1-1/exp(2*x))^(1/2),x, algorithm="fricas")
```

```
[Out] 2*arctan((sqrt(-e^(-2*x) + 1) - 1)*e^x)
```

Sympy [A]
time = 0.48, size = 7, normalized size = 0.88

$$-\operatorname{asin}\left(e^{-x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(x)/(1-1/exp(2*x))**(1/2),x)
```

```
[Out] -asin(exp(-x))
```

Giac [A]
time = 3.00, size = 9, normalized size = 1.12

$$\arctan\left(\sqrt{e^{(2x)}-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(x)/(1-1/exp(2*x))^(1/2),x, algorithm="giac")
```

```
[Out] arctan(sqrt(e^(2*x) - 1))
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.12

$$\int \frac{e^{-x}}{\sqrt{1-e^{-2x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-x)/(1 - exp(-2*x))^(1/2),x)
```

```
[Out] int(exp(-x)/(1 - exp(-2*x))^(1/2), x)
```

3.637 $\int \frac{e^x}{4+e^{2x}}\,dx$

Optimal. Leaf size=12

$$\frac{1}{2}\tan^{-1}\left(\frac{e^x}{2}\right)$$

```
[Out] 1/2*arctan(1/2*exp(x))
```

Rubi [A]
time = 0.01, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2281, 209}

$$\frac{1}{2}\text{ArcTan}\left(\frac{e^x}{2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^x/(4 + E^(2*x)),x]
```

```
[Out] ArcTan[E^x/2]/2
```

Rule 209

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[b, 2]))*A
rcTan[Rt[b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^x}{4+e^{2x}}\,dx &= \text{Subst}\left(\int \frac{1}{4+x^2}\,dx, x, e^x\right)\\ &= \frac{1}{2}\tan^{-1}\left(\frac{e^x}{2}\right)\end{aligned}$$

Mathematica [A]
time = 0.01, size = 12, normalized size = 1.00

$$\frac{1}{2}\tan^{-1}\left(\frac{e^x}{2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(4 + E^(2*x)),x]
```

```
[Out] ArcTan[E^x/2]/2
```

Maple [A]
time = 0.02, size = 8, normalized size = 0.67

method	result	size
default	$\frac{\arctan\left(\frac{{e}^{x}}{2}\right)}{2}$	8
risch	$\frac{i\ln\left({e}^{x}+2 i\right)}{4}-\frac{i\ln\left({e}^{x}-2 i\right)}{4}$	20

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(4+exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*arctan(1/2*exp(x))
```

Maxima [A]
time = 0.48, size = 7, normalized size = 0.58

$$\frac{1}{2}\arctan\left(\frac{1}{2}e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(4+exp(2*x)),x, algorithm="maxima")
```

```
[Out] 1/2*arctan(1/2*e^x)
```

Fricas [A]
time = 0.41, size = 7, normalized size = 0.58

$$\frac{1}{2}\arctan\left(\frac{1}{2}e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(4+exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/2*arctan(1/2*e^x)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 15 vs. $2(7) = 14$.
time = 0.03, size = 15, normalized size = 1.25

$$\operatorname{RootSum}\left(16z^2 + 1, \left(i \mapsto i \log\left(8i + e^x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(4+exp(2*x)),x)
```

```
[Out] RootSum(16*_z**2 + 1, Lambda(_i, _i*log(8*_i + exp(x))))
```

Giac [A]
time = 3.60, size = 7, normalized size = 0.58

$$\frac{1}{2}\arctan\left(\frac{1}{2}e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(4+exp(2*x)),x, algorithm="giac")
```

```
[Out] 1/2*arctan(1/2*e^x)
```

Mupad [B]
time = 3.58, size = 7, normalized size = 0.58

$$\frac{\operatorname{atan}\left(\frac{e^x}{2}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(2*x) + 4),x)
```

```
[Out] atan(exp(x)/2)/2
```

3.638 $\int \frac{e^x}{1-e^{2x}}\,dx$

Optimal. Leaf size=4

$$\tanh^{-1}\left(e^x\right)$$

```
[Out] arctanh(exp(x))
```

Rubi [A]
time = 0.01, antiderivative size = 4, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {2281, 212}

$$\tanh^{-1}\left(e^x\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^x/(1 - E^(2*x)),x]
```

```
[Out] ArcTanh[E^x]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^x}{1-e^{2x}}\,dx &= \text{Subst}\left(\int \frac{1}{1-x^2}\,dx,x,e^x\right)\\ &= \tanh^{-1}\left(e^x\right)\end{aligned}$$

Mathematica [A]
time = 0.00, size = 4, normalized size = 1.00

$$\tanh^{-1}\left(e^x\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(1 - E^(2*x)),x]
```

```
[Out] ArcTanh[E^x]
```

Maple [A]
time = 0.02, size = 4, normalized size = 1.00

method	result	size
default	$\operatorname{arctanh}\left(e^{x}\right)$	4
norman	$-\frac{\ln\left(-1+e^{x}\right)}{2}+\frac{\ln\left(1+e^{x}\right)}{2}$	16
risch	$-\frac{\ln\left(-1+e^{x}\right)}{2}+\frac{\ln\left(1+e^{x}\right)}{2}$	16

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(1-exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] arctanh(exp(x))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 15 vs. $2(3) = 6$.
time = 0.29, size = 15, normalized size = 3.75

$$\frac{1}{2}\log\left(e^{x}+1\right)-\frac{1}{2}\log\left(e^{x}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1-exp(2*x)),x, algorithm="maxima")
```

```
[Out] 1/2*log(e^x + 1) - 1/2*log(e^x - 1)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 15 vs. $2(3) = 6$.
time = 0.43, size = 15, normalized size = 3.75

$$\frac{1}{2}\log\left(e^{x}+1\right)-\frac{1}{2}\log\left(e^{x}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1-exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/2*log(e^x + 1) - 1/2*log(e^x - 1)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 15 vs. $2(3) = 6$.
time = 0.03, size = 15, normalized size = 3.75

$$-\frac{\log\left(e^{x}-1\right)}{2}+\frac{\log\left(e^{x}+1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1-exp(2*x)),x)
```

```
[Out] -log(exp(x) - 1)/2 + log(exp(x) + 1)/2
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 16 vs. $2(3) = 6$.
time = 3.67, size = 16, normalized size = 4.00

$$\frac{1}{2}\log\left(e^{x}+1\right)-\frac{1}{2}\log\left(\left|e^{x}-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1-exp(2*x)),x, algorithm="giac")
```

```
[Out] 1/2*log(e^x + 1) - 1/2*log(abs(e^x - 1))
```

Mupad [B]
time = 0.13, size = 15, normalized size = 3.75

$$\frac{\ln\left(\mathrm{e}^{x}+1\right)}{2}-\frac{\ln\left(\mathrm{e}^{x}-1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-exp(x)/(exp(2*x) - 1),x)
```

```
[Out] log(exp(x) + 1)/2 - log(exp(x) - 1)/2
```

3.639 $\int \frac{e^x}{3-4e^{2x}} dx$

Optimal. Leaf size=20

$$\frac{\tanh^{-1}\left(\frac{2e^x}{\sqrt{3}}\right)}{2\sqrt{3}}$$

[Out] 1/6*arctanh(2/3*exp(x)*3^(1/2))*3^(1/2)

Rubi [A]
time = 0.01, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {2281, 212}

$$\frac{\tanh^{-1}\left(\frac{2e^x}{\sqrt{3}}\right)}{2\sqrt{3}}$$

Antiderivative was successfully verified.

[In] Int[E^x/(3 - 4*E^(2*x)),x]

[Out] ArcTanh[(2*E^x)/Sqrt[3]]/(2*Sqrt[3])

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^x}{3-4e^{2x}} dx &= \text{Subst}\left(\int \frac{1}{3-4x^2} dx, x, e^x\right)\\ &= \frac{\tanh^{-1}\left(\frac{2e^x}{\sqrt{3}}\right)}{2\sqrt{3}}\end{aligned}$$

Mathematica [A]
time = 0.03, size = 20, normalized size = 1.00

$$\frac{\tanh^{-1}\left(\frac{2e^x}{\sqrt{3}}\right)}{2\sqrt{3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(3 - 4*E^(2*x)),x]
```

```
[Out] ArcTanh[(2*E^x)/Sqrt[3]]/(2*Sqrt[3])
```

Maple [A]
time = 0.02, size = 14, normalized size = 0.70

method	result	size
default	$\frac{\operatorname{arctanh}\left(\frac{2\,e^x\sqrt{3}}{3}\right)\sqrt{3}}{6}$	14
risch	$\frac{\sqrt{3}\,\ln\left(e^x+\frac{\sqrt{3}}{2}\right)}{12}-\frac{\sqrt{3}\,\ln\left(e^x-\frac{\sqrt{3}}{2}\right)}{12}$	30

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(3-4*exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/6*arctanh(2/3*exp(x)*3^(1/2))*3^(1/2)
```

Maxima [A]
time = 0.48, size = 26, normalized size = 1.30

$$-\frac{1}{12}\sqrt{3}\,\log\left(-\frac{\sqrt{3}-2\,e^x}{\sqrt{3}+2\,e^x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(3-4*exp(2*x)),x, algorithm="maxima")
```

```
[Out] -1/12*sqrt(3)*log(-(sqrt(3) - 2*e^x)/(sqrt(3) + 2*e^x))
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 32 vs. $2(13) = 26$.
time = 0.39, size = 32, normalized size = 1.60

$$\frac{1}{12}\sqrt{3}\,\log\left(\frac{4\sqrt{3}\,e^x+4\,e^{(2\,x)}+3}{4\,e^{(2\,x)}-3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(3-4*exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/12*sqrt(3)*log((4*sqrt(3)*e^x + 4*e^(2*x) + 3)/(4*e^(2*x) - 3))
```

Sympy [A]
time = 0.04, size = 15, normalized size = 0.75

$$\operatorname{RootSum}\left(48z^{2}-1,\left(i\mapsto i\log\left(6i+e^{x}\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(3-4*exp(2*x)),x)
```

```
[Out] RootSum(48*_z**2 - 1, Lambda(_i, _i*log(6*_i + exp(x))))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 30 vs. 2(13) = 26.
time = 4.03, size = 30, normalized size = 1.50

$$\frac{1}{12}\sqrt{3}\log\left(\frac{1}{2}\sqrt{3}+e^{x}\right)-\frac{1}{12}\sqrt{3}\log\left(\left|-\frac{1}{2}\sqrt{3}+e^{x}\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(3-4*exp(2*x)),x, algorithm="giac")
```

```
[Out] 1/12*sqrt(3)*log(1/2*sqrt(3) + e^x) - 1/12*sqrt(3)*log(abs(-1/2*sqrt(3) + e
^x))
```

Mupad [B]
time = 0.16, size = 13, normalized size = 0.65

$$\frac{\sqrt{3}\operatorname{atanh}\left(\frac{2\sqrt{3}\,e^{x}}{3}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-exp(x)/(4*exp(2*x) - 3),x)
```

```
[Out] (3^(1/2)*atanh((2*3^(1/2)*exp(x))/3))/6
```

3.640 $\int e^x \sqrt{3-4e^{2x}}\,dx$

Optimal. Leaf size=36

$$\frac{1}{2}e^x\sqrt{3-4e^{2x}}+\frac{3}{4}\sin^{-1}\left(\frac{2e^x}{\sqrt{3}}\right)$$

```
[Out] 3/4*arcsin(2/3*exp(x)*3^(1/2))+1/2*exp(x)*(3-4*exp(2*x))^(1/2)
```

Rubi [A]
time = 0.02, antiderivative size = 36, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.176$, Rules used = {2281, 201, 222}

$$\frac{3}{4}\text{ArcSin}\left(\frac{2e^x}{\sqrt{3}}\right)+\frac{1}{2}e^x\sqrt{3-4e^{2x}}$$

Antiderivative was successfully verified.

```
[In] Int[E^x*Sqrt[3 - 4*E^(2*x)],x]
```

```
[Out] (E^x*Sqrt[3 - 4*E^(2*x)])/2 + (3*ArcSin[(2*E^x)/Sqrt[3]])/4
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int e^x\sqrt{3-4e^{2x}}\,dx=\text{Subst}\left(\int\sqrt{3-4x^2}\,dx,x,e^x\right)$$
$$=\frac{1}{2}e^x\sqrt{3-4e^{2x}}+\frac{3}{2}\text{Subst}\left(\int\frac{1}{\sqrt{3-4x^2}}\,dx,x,e^x\right)$$
$$=\frac{1}{2}e^x\sqrt{3-4e^{2x}}+\frac{3}{4}\sin^{-1}\left(\frac{2e^x}{\sqrt{3}}\right)$$

Mathematica [C] Result contains complex when optimal does not.
time = 0.04, size = 49, normalized size = 1.36

$$\frac{1}{2}e^x\sqrt{3-4e^{2x}}+\frac{3}{4}i\log\left(-2ie^x+\sqrt{3-4e^{2x}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*Sqrt[3 - 4*E^(2*x)],x]
```

```
[Out] (E^x*Sqrt[3 - 4*E^(2*x)])/2 + ((3*I)/4)*Log[(-2*I)*E^x + Sqrt[3 - 4*E^(2*x)
]]
```

Maple [A]
time = 0.02, size = 26, normalized size = 0.72

method	result	size
default	$\frac{3\arcsin\left(\frac{2\,e^{x}\sqrt{3}}{3}\right)}{4}+\frac{e^{x}\sqrt{3-4\,e^{2x}}}{2}$	26
risch	$-\frac{e^{x}\left(-3+4\,e^{2x}\right)}{2\sqrt{3-4\,e^{2x}}}+\frac{3\arcsin\left(\frac{2\,e^{x}\sqrt{3}}{3}\right)}{4}$	34

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(3-4*exp(2*x))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*exp(x)*(3-4*exp(x)^2)^(1/2)+3/4*arcsin(2/3*exp(x)*3^(1/2))
```

Maxima [A]
time = 0.49, size = 25, normalized size = 0.69

$$\frac{1}{2}\,\sqrt{-4\,e^{(2\,x)}+3}\,e^{x}+\frac{3}{4}\,\arcsin\left(\frac{2}{3}\,\sqrt{3}\,e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(3-4*exp(2*x))^(1/2),x, algorithm="maxima")
[Out] 1/2*sqrt(-4*e^(2*x) + 3)*e^x + 3/4*arcsin(2/3*sqrt(3)*e^x)
```

Fricas [A]
time = 0.45, size = 34, normalized size = 0.94

$$\frac{1}{2}\,\sqrt{-4\,e^{(2\,x)}+3}\,e^{x}-\frac{3}{4}\,\arctan\left(\frac{1}{2}\,\sqrt{-4\,e^{(2\,x)}+3}\,e^{(-x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(3-4*exp(2*x))^(1/2),x, algorithm="fricas")
[Out] 1/2*sqrt(-4*e^(2*x) + 3)*e^x - 3/4*arctan(1/2*sqrt(-4*e^(2*x) + 3)*e^(-x))
```

Sympy [A]
time = 0.69, size = 51, normalized size = 1.42

$$\begin{cases}\frac{\sqrt{3-4e^{2x}}\,e^{x}}{2}+\frac{3\operatorname{asin}\left(\frac{2\sqrt{3}\,e^{x}}{3}\right)}{4} & \text{for}\ e^{x}>-\frac{\sqrt{3}}{2}\wedge e^{x}<\frac{\sqrt{3}}{2}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(3-4*exp(2*x))**(1/2),x)
[Out] Piecewise((sqrt(3 - 4*exp(2*x))*exp(x)/2 + 3*asin(2*sqrt(3)*exp(x)/3)/4, (e
xp(x) > -sqrt(3)/2) & (exp(x) < sqrt(3)/2)))
```

Giac [A]
time = 5.11, size = 25, normalized size = 0.69

$$\frac{1}{2}\,\sqrt{-4\,e^{(2\,x)}+3}\,e^{x}+\frac{3}{4}\,\arcsin\left(\frac{2}{3}\,\sqrt{3}\,e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(3-4*exp(2*x))^(1/2),x, algorithm="giac")
[Out] 1/2*sqrt(-4*e^(2*x) + 3)*e^x + 3/4*arcsin(2/3*sqrt(3)*e^x)
```

Mupad [B]
time = 0.09, size = 24, normalized size = 0.67

$$\frac{3\operatorname{asin}\left(\frac{2\sqrt{3}\,\mathrm{e}^{x}}{3}\right)}{4}+\mathrm{e}^{x}\,\sqrt{\frac{3}{4}-\mathrm{e}^{2\,x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(3 - 4*exp(2*x))^(1/2),x)
[Out] (3*asin((2*3^(1/2)*exp(x))/3))/4 + exp(x)*(3/4 - exp(2*x))^(1/2)
```

3.641 $\int e^{x^2} x^3 \, dx$

Optimal. Leaf size=22

$$-\frac{e^{x^2}}{2}+\frac{1}{2}e^{x^2}x^2$$

```
[Out] -1/2*exp(x^2)+1/2*exp(x^2)*x^2
```

Rubi [A]
time = 0.01, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {2243, 2240}

$$\frac{1}{2}e^{x^2}x^2-\frac{e^{x^2}}{2}$$

Antiderivative was successfully verified.

```
[In] Int[E^x^2*x^3,x]
```

```
[Out] -1/2*E^x^2 + (E^x^2*x^2)/2
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\begin{aligned}\int e^{x^2}x^3\,dx&=\frac{1}{2}e^{x^2}x^2-\int e^{x^2}x\,dx\\&=-\frac{e^{x^2}}{2}+\frac{1}{2}e^{x^2}x^2\end{aligned}$$

Mathematica [A]
time = 0.02, size = 14, normalized size = 0.64

$$\frac{1}{2}e^{x^2}\left(-1+x^2\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x^2*x^3,x]
```

```
[Out] (E^x^2*(-1 + x^2))/2
```

Maple [A]
time = 0.02, size = 17, normalized size = 0.77

method	result	size
gosper	$\frac{(x^2-1)e^{x^2}}{2}$	12
risch	$\left(\frac{x^2}{2}-\frac{1}{2}\right)e^{x^2}$	13
meijerg	$\frac{1}{2}-\frac{(-2x^2+2)e^{x^2}}{4}$	16
derivativedivides	$-\frac{e^{x^2}}{2}+\frac{e^{x^2}x^2}{2}$	17
default	$-\frac{e^{x^2}}{2}+\frac{e^{x^2}x^2}{2}$	17
norman	$-\frac{e^{x^2}}{2}+\frac{e^{x^2}x^2}{2}$	17

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^2)*x^3,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*exp(x^2)+1/2*exp(x^2)*x^2
```

Maxima [A]
time = 0.28, size = 11, normalized size = 0.50

$$\frac{1}{2}\left(x^2-1\right)e^{\left(x^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*x^3,x, algorithm="maxima")
```

```
[Out] 1/2*(x^2 - 1)*e^(x^2)
```

Fricas [A]
time = 0.41, size = 11, normalized size = 0.50

$$\frac{1}{2}\left(x^2-1\right)e^{\left(x^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*x^3,x, algorithm="fricas")
```

```
[Out] 1/2*(x^2 - 1)*e^(x^2)
```

Sympy [A]
time = 0.02, size = 10, normalized size = 0.45

$$\frac{(x^2 - 1)\, e^{x^2}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**2)*x**3,x)
```

```
[Out] (x**2 - 1)*exp(x**2)/2
```

Giac [A]
time = 3.77, size = 11, normalized size = 0.50

$$\frac{1}{2}\left(x^2 - 1\right)e^{\left(x^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*x^3,x, algorithm="giac")
```

```
[Out] 1/2*(x^2 - 1)*e^(x^2)
```

Mupad [B]
time = 0.04, size = 11, normalized size = 0.50

$$\frac{\mathrm{e}^{x^2}\,\left(x^2 - 1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*exp(x^2),x)
```

```
[Out] (exp(x^2)*(x^2 - 1))/2
```

3.642 $\int e^x \sqrt{1-e^{2x}}\, dx$

Optimal. Leaf size=29

$$\frac{1}{2}e^x\sqrt{1-e^{2x}}+\frac{1}{2}\sin^{-1}(e^x)$$

```
[Out] 1/2*arcsin(exp(x))+1/2*exp(x)*(1-exp(2*x))^(1/2)
```

Rubi [A]
time = 0.02, antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.176$, Rules used = {2281, 201, 222}

$$\frac{\text{ArcSin}(e^x)}{2}+\frac{1}{2}e^x\sqrt{1-e^{2x}}$$

Antiderivative was successfully verified.

```
[In] Int[E^x*Sqrt[1 - E^(2*x)],x]
```

```
[Out] (E^x*Sqrt[1 - E^(2*x)])/2 + ArcSin[E^x]/2
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int e^x\sqrt{1-e^{2x}}\,dx = \text{Subst}\left(\int \sqrt{1-x^2}\,dx, x, e^x\right)$$
$$= \frac{1}{2}e^x\sqrt{1-e^{2x}} + \frac{1}{2}\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, e^x\right)$$
$$= \frac{1}{2}e^x\sqrt{1-e^{2x}} + \frac{1}{2}\sin^{-1}(e^x)$$

Mathematica [A]
time = 0.06, size = 45, normalized size = 1.55

$$\frac{1}{2}e^x\sqrt{1-e^{2x}} - \tan^{-1}\left(\frac{\sqrt{1-e^{2x}}}{1+e^x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*Sqrt[1 - E^(2*x)],x]
[Out] (E^x*Sqrt[1 - E^(2*x)])/2 - ArcTan[Sqrt[1 - E^(2*x)]/(1 + E^x)]
```

Maple [A]
time = 0.02, size = 21, normalized size = 0.72

method	result	size
default	$\frac{\arcsin(e^x)}{2} + \frac{e^x\sqrt{1-e^{2x}}}{2}$	21
risch	$-\frac{e^x(-1+e^{2x})}{2\sqrt{1-e^{2x}}} + \frac{\arcsin(e^x)}{2}$	27

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(1-exp(2*x))^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/2*exp(x)*(1-exp(x)^2)^(1/2)+1/2*arcsin(exp(x))
```

Maxima [A]
time = 0.48, size = 20, normalized size = 0.69

$$\frac{1}{2}\sqrt{-e^{(2x)}+1}\,e^x + \frac{1}{2}\arcsin(e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(1-exp(2*x))^(1/2),x, algorithm="maxima")
[Out] 1/2*sqrt(-e^(2*x) + 1)*e^x + 1/2*arcsin(e^x)
```

Fricas [A]
time = 0.39, size = 35, normalized size = 1.21

$$\frac{1}{2}\,\sqrt{-e^{(2\,x)}+1}\,e^{x}-\arctan\left(\left(\sqrt{-e^{(2\,x)}+1}-1\right)e^{(-x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(1-exp(2*x))^(1/2),x, algorithm="fricas")
[Out] 1/2*sqrt(-e^(2*x) + 1)*e^x - arctan((sqrt(-e^(2*x) + 1) - 1)*e^(-x))
```

Sympy [A]
time = 0.61, size = 29, normalized size = 1.00

$$\begin{cases} \frac{\sqrt{1-e^{2x}}\,e^{x}}{2}+\frac{\operatorname{asin}{\left(e^{x}\right)}}{2} & \text{for}\: e^{x}>-1\wedge e^{x}<1 \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(1-exp(2*x))**(1/2),x)
[Out] Piecewise((sqrt(1 - exp(2*x))*exp(x)/2 + asin(exp(x))/2, (exp(x) > -1) & (e
xp(x) < 1)))
```

Giac [A]
time = 3.78, size = 20, normalized size = 0.69

$$\frac{1}{2}\,\sqrt{-e^{(2\,x)}+1}\,e^{x}+\frac{1}{2}\,\arcsin\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(1-exp(2*x))^(1/2),x, algorithm="giac")
[Out] 1/2*sqrt(-e^(2*x) + 1)*e^x + 1/2*arcsin(e^x)
```

Mupad [B]
time = 3.35, size = 20, normalized size = 0.69

$$\frac{\mathrm{asin}\left({\mathrm{e}}^x\right)}{2}+\frac{{\mathrm{e}}^x\,\sqrt{1-{\mathrm{e}}^{2\,x}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(1 - exp(2*x))^(1/2),x)
[Out] asin(exp(x))/2 + (exp(x)*(1 - exp(2*x))^(1/2))/2
```

3.643 $\int \frac{e^x}{\sqrt{1+e^x+e^{2x}}} \, dx$

Optimal. Leaf size=14

$$\sinh^{-1}\left(\frac{1+2e^x}{\sqrt{3}}\right)$$

```
[Out] arcsinh(1/3*(1+2*exp(x))*3^(1/2))
```

Rubi [A]
time = 0.02, antiderivative size = 14, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {2320, 633, 221}

$$\sinh^{-1}\left(\frac{2e^x+1}{\sqrt{3}}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^x/Sqrt[1 + E^x + E^(2*x)],x]
```

```
[Out] ArcSinh[(1 + 2*E^x)/Sqrt[3]]
```

Rule 221

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[Rt[b, 2]*(x/Sqrt
[a])]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 633

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Dist[1/(2*c*(-4*
(c/(b^2 - 4*a*c)))^p), Subst[Int[Simp[1 - x^2/(b^2 - 4*a*c), x]^p, x], x, b
 + 2*c*x], x] /; FreeQ[{a, b, c, p}, x] && GtQ[4*a - b^2/c, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{e^x}{\sqrt{1+e^x+e^{2x}}}\,dx = \text{Subst}\left(\int \frac{1}{\sqrt{1+x+x^2}}\,dx, x, e^x\right)$$
$$= \frac{\text{Subst}\left(\int \frac{1}{\sqrt{1+\frac{x^2}{3}}}\,dx, x, 1+2e^x\right)}{\sqrt{3}}$$
$$= \sinh^{-1}\left(\frac{1+2e^x}{\sqrt{3}}\right)$$

Mathematica [A]
time = 0.06, size = 26, normalized size = 1.86

$$-\log\left(-1-2e^x+2\sqrt{1+e^x+e^{2x}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/Sqrt[1 + E^x + E^(2*x)],x]
```

```
[Out] -Log[-1 - 2*E^x + 2*Sqrt[1 + E^x + E^(2*x)]]
```

Maple [A]
time = 0.02, size = 11, normalized size = 0.79

method	result	size
default	$\operatorname{arcsinh}\left(\frac{2\sqrt{3}\,(\mathrm{e}^x+\frac{1}{2})}{3}\right)$	11

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(1+exp(x)+exp(2*x))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] arcsinh(2/3*3^(1/2)*(exp(x)+1/2))
```

Maxima [A]
time = 0.49, size = 12, normalized size = 0.86

$$\operatorname{arsinh}\left(\frac{1}{3}\sqrt{3}\,(2\,e^x+1)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(x)+exp(2*x))^(1/2),x, algorithm="maxima")
```

```
[Out] arcsinh(1/3*sqrt(3)*(2*e^x + 1))
```

Fricas [A]
time = 0.46, size = 21, normalized size = 1.50

$$-\log\left(2\sqrt{e^{(2x)}+e^{x}+1}-2e^{x}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(x)+exp(2*x))^(1/2),x, algorithm="fricas")
[Out] -log(2*sqrt(e^(2*x) + e^x + 1) - 2*e^x - 1)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{e^{x}}{\sqrt{e^{2x}+e^{x}+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(x)+exp(2*x))**(1/2),x)
[Out] Integral(exp(x)/sqrt(exp(2*x) + exp(x) + 1), x)
```

Giac [A]
time = 4.24, size = 21, normalized size = 1.50

$$-\log\left(2\sqrt{e^{(2x)}+e^{x}+1}-2e^{x}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(x)+exp(2*x))^(1/2),x, algorithm="giac")
[Out] -log(2*sqrt(e^(2*x) + e^x + 1) - 2*e^x - 1)
```

Mupad [B]
time = 3.64, size = 15, normalized size = 1.07

$$\ln\left(\mathrm{e}^{x}+\sqrt{\mathrm{e}^{2x}+\mathrm{e}^{x}+1}+\frac{1}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(2*x) + exp(x) + 1)^(1/2),x)
[Out] log(exp(x) + (exp(2*x) + exp(x) + 1)^(1/2) + 1/2)
```

3.644 $\int \frac{e^x}{-4+e^{2x}}\,dx$

Optimal. Leaf size=12

$$-\frac{1}{2}\tanh^{-1}\left(\frac{e^x}{2}\right)$$

```
[Out] -1/2*arctanh(1/2*exp(x))
```

Rubi [A]
time = 0.01, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2281, 213}

$$-\frac{1}{2}\tanh^{-1}\left(\frac{e^x}{2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^x/(-4 + E^(2*x)),x]
```

```
[Out] -1/2*ArcTanh[E^x/2]
```

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned} \int \frac{e^x}{-4+e^{2x}}\,dx &= \text{Subst}\left(\int \frac{1}{-4+x^2}\,dx, x, e^x\right)\\ &= -\frac{1}{2}\tanh^{-1}\left(\frac{e^x}{2}\right) \end{aligned}$$

Mathematica [A]
time = 0.02, size = 12, normalized size = 1.00

$$-\frac{1}{2}\tanh^{-1}\left(\frac{e^x}{2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(-4 + E^(2*x)),x]
```

```
[Out] -1/2*ArcTanh[E^x/2]
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 15 vs. $2(7) = 14$.
time = 0.02, size = 16, normalized size = 1.33

method	result	size
default	$\frac{\ln(-2+e^x)}{4} - \frac{\ln(2+e^x)}{4}$	16
norman	$\frac{\ln(-2+e^x)}{4} - \frac{\ln(2+e^x)}{4}$	16
risch	$\frac{\ln(-2+e^x)}{4} - \frac{\ln(2+e^x)}{4}$	16

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(-4+exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/4*ln(-2+exp(x))-1/4*ln(2+exp(x))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 15 vs. $2(7) = 14$.
time = 0.29, size = 15, normalized size = 1.25

$$-\frac{1}{4}\log\left(e^x+2\right)+\frac{1}{4}\log\left(e^x-2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-4+exp(2*x)),x, algorithm="maxima")
```

```
[Out] -1/4*log(e^x + 2) + 1/4*log(e^x - 2)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 15 vs. $2(7) = 14$.
time = 0.40, size = 15, normalized size = 1.25

$$-\frac{1}{4}\log\left(e^x+2\right)+\frac{1}{4}\log\left(e^x-2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-4+exp(2*x)),x, algorithm="fricas")
```

```
[Out] -1/4*log(e^x + 2) + 1/4*log(e^x - 2)
```

Sympy [A]
time = 0.03, size = 15, normalized size = 1.25

$$\frac{\log\left(e^{x}-2\right)}{4}-\frac{\log\left(e^{x}+2\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-4+exp(2*x)),x)
```

```
[Out] log(exp(x) - 2)/4 - log(exp(x) + 2)/4
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 16 vs. 2(7) = 14.
time = 4.70, size = 16, normalized size = 1.33

$$-\frac{1}{4}\log\left(e^{x}+2\right)+\frac{1}{4}\log\left(\left|e^{x}-2\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-4+exp(2*x)),x, algorithm="giac")
```

```
[Out] -1/4*log(e^x + 2) + 1/4*log(abs(e^x - 2))
```

Mupad [B]
time = 0.14, size = 15, normalized size = 1.25

$$\frac{\ln\left(\mathrm{e}^{x}-2\right)}{4}-\frac{\ln\left(\mathrm{e}^{x}+2\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(2*x) - 4),x)
```

```
[Out] log(exp(x) - 2)/4 - log(exp(x) + 2)/4
```

3.645 $\int e^{2-x^2} x \, dx$

Optimal. Leaf size=13

$$-\frac{1}{2}e^{2-x^2}$$

```
[Out] -1/2*exp(-x^2+2)
```

Rubi [A]
time = 0.01, antiderivative size = 13, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2240}

$$-\frac{1}{2}e^{2-x^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(2 - x^2)*x,x]
```

```
[Out] -1/2*E^(2 - x^2)
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int e^{2-x^2} x \, dx = -\frac{1}{2}e^{2-x^2}$$

Mathematica [A]
time = 0.01, size = 13, normalized size = 1.00

$$-\frac{1}{2}e^{2-x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(2 - x^2)*x,x]
```

```
[Out] -1/2*E^(2 - x^2)
```

Maple [A]
time = 0.01, size = 11, normalized size = 0.85

method	result	size
gosper	$-\frac{e^{-x^2+2}}{2}$	11
derivativedivides	$-\frac{e^{-x^2+2}}{2}$	11
default	$-\frac{e^{-x^2+2}}{2}$	11
norman	$-\frac{e^{-x^2+2}}{2}$	11
risch	$-\frac{e^{-x^2+2}}{2}$	11
meijerg	$\frac{e^2\left(1-e^{-x^2}\right)}{2}$	15

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-x^2+2)*x,x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*exp(-x^2+2)
```

Maxima [A]
time = 0.28, size = 10, normalized size = 0.77

$$-\frac{1}{2}\,e^{\left(-x^2+2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-x^2+2)*x,x, algorithm="maxima")
```

```
[Out] -1/2*e^(-x^2 + 2)
```

Fricas [A]
time = 0.41, size = 10, normalized size = 0.77

$$-\frac{1}{2}\,e^{\left(-x^2+2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-x^2+2)*x,x, algorithm="fricas")
```

```
[Out] -1/2*e^(-x^2 + 2)
```

Sympy [A]
time = 0.02, size = 8, normalized size = 0.62

$$-\frac{e^{2-x^2}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-x**2+2)*x,x)
```

```
[Out] -exp(2 - x**2)/2
```

Giac [A]
time = 3.71, size = 10, normalized size = 0.77

$$-\frac{1}{2}\,e^{\left(-x^2+2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-x^2+2)*x,x, algorithm="giac")
```

```
[Out] -1/2*e^(-x^2 + 2)
```

Mupad [B]
time = 0.06, size = 10, normalized size = 0.77

$$-\frac{\mathrm{e}^2\,\mathrm{e}^{-x^2}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*exp(2 - x^2),x)
```

```
[Out] -(exp(2)*exp(-x^2))/2
```

3.646 $\int (e^x - x^e)\, dx$

Optimal. Leaf size=16

$$e^x - \frac{x^{1+e}}{1+e}$$

```
[Out] exp(x)-x^(1+E)/(1+E)
```

Rubi [A]
time = 0.00, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2225}

$$e^x - \frac{x^{1+e}}{1+e}$$

Antiderivative was successfully verified.

```
[In] Int[E^x - x^E,x]
```

```
[Out] E^x - x^(1 + E)/(1 + E)
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned} \int (e^x - x^e)\, dx &= -\frac{x^{1+e}}{1+e} + \int e^x\, dx \\ &= e^x - \frac{x^{1+e}}{1+e} \end{aligned}$$

Mathematica [A]
time = 0.01, size = 16, normalized size = 1.00

$$e^x - \frac{x^{1+e}}{1+e}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x - x^E,x]
```

```
[Out] E^x - x^(1 + E)/(1 + E)
```

Maple [A]
time = 0.02, size = 18, normalized size = 1.12

method	result	size
risch	$-\frac{x\,x^{\mathrm{e}}}{1+\mathrm{e}}+\mathrm{e}^{x}$	17
default	$\mathrm{e}^{x}-\frac{x^{1+\mathrm{e}}}{1+\mathrm{e}}$	18
norman	$-\frac{x\,\mathrm{e}^{\mathrm{e}\ln(x)}}{1+\mathrm{e}}+\mathrm{e}^{x}$	19

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)-x^exp(1),x,method=_RETURNVERBOSE)
[Out] exp(x)-x^(1+exp(1))/(1+exp(1))
```

Maxima [A]
time = 0.28, size = 17, normalized size = 1.06

$$-\frac{x^{e+1}}{e+1}+e^{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)-x^exp(1),x, algorithm="maxima")
[Out] -x^(e + 1)/(e + 1) + e^x
```

Fricas [A]
time = 0.35, size = 23, normalized size = 1.44

$$-\frac{xx^{e}-(e+1)e^{x}}{e+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)-x^exp(1),x, algorithm="fricas")
[Out] -(x*x^e - (e + 1)*e^x)/(e + 1)
```

Sympy [A]
time = 0.02, size = 14, normalized size = 0.88

$$-\frac{x^{1+e}}{1+e}+e^{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)-x**E,x)
[Out] -x**(1 + E)/(1 + E) + exp(x)
```

Giac [A]
time = 0.43, size = 17, normalized size = 1.06

$$-\frac{x^{e+1}}{e+1} + e^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)-x^exp(1),x, algorithm="giac")
```

```
[Out] -x^(e + 1)/(e + 1) + e^x
```

Mupad [B]
time = 3.33, size = 16, normalized size = 1.00

$$e^x - \frac{x\,x^e}{e+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x) - x^exp(1),x)
```

```
[Out] exp(x) - (x*x^exp(1))/(exp(1) + 1)
```

3.647 $\int \frac{-1+e^{2x}}{3+e^{2x}} \, dx$

Optimal. Leaf size=18

$$-\frac{x}{3}+\frac{2}{3}\log\left(3+e^{2x}\right)$$

[Out] -1/3*x+2/3*ln(3+exp(2*x))

Rubi [A]

time = 0.02, antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$, Rules used = {2320, 78}

$$\frac{2}{3}\log\left(e^{2x}+3\right)-\frac{x}{3}$$

Antiderivative was successfully verified.

[In] Int[(-1 + E^(2*x))/(3 + E^(2*x)),x]

[Out] -1/3*x + (2*Log[3 + E^(2*x)])/3

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}
\int \frac{-1+e^{2x}}{3+e^{2x}} \, dx &= \frac{1}{2}\text{Subst}\left(\int \frac{-1+x}{x(3+x)} \, dx, x, e^{2x}\right)\\
&= \frac{1}{2}\text{Subst}\left(\int \left(-\frac{1}{3x}+\frac{4}{3(3+x)}\right) dx, x, e^{2x}\right)\\
&= -\frac{x}{3}+\frac{2}{3}\log\left(3+e^{2x}\right)
\end{aligned}$$

Mathematica [A]
time = 0.03, size = 21, normalized size = 1.17

$$-\frac{1}{3}\log\left(e^{x}\right)+\frac{2}{3}\log\left(3+e^{2x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(-1 + E^(2*x))/(3 + E^(2*x)),x]
```

```
[Out] -1/3*Log[E^x] + (2*Log[3 + E^(2*x)])/3
```

Maple [A]
time = 0.01, size = 18, normalized size = 1.00

method	result	size
norman	$-\frac{x}{3}+\frac{2\ln\left(3+{e}^{2x}\right)}{3}$	14
risch	$-\frac{x}{3}+\frac{2\ln\left(3+{e}^{2x}\right)}{3}$	14
derivativedivides	$-\frac{\ln\left({e}^{2x}\right)}{6}+\frac{2\ln\left(3+{e}^{2x}\right)}{3}$	18
default	$-\frac{\ln\left({e}^{2x}\right)}{6}+\frac{2\ln\left(3+{e}^{2x}\right)}{3}$	18

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-1+exp(2*x))/(3+exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/6*ln(exp(2*x))+2/3*ln(3+exp(2*x))
```

Maxima [A]
time = 0.34, size = 13, normalized size = 0.72

$$-\frac{1}{3}x+\frac{2}{3}\log\left(e^{(2x)}+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-1+exp(2*x))/(3+exp(2*x)),x, algorithm="maxima")
```

```
[Out] -1/3*x + 2/3*log(e^(2*x) + 3)
```

Fricas [A]
time = 0.43, size = 13, normalized size = 0.72

$$-\frac{1}{3}x+\frac{2}{3}\log\left(e^{(2x)}+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-1+exp(2*x))/(3+exp(2*x)),x, algorithm="fricas")
```

```
[Out] -1/3*x + 2/3*log(e^(2*x) + 3)
```

Sympy [A]
time = 0.02, size = 14, normalized size = 0.78

$$-\frac{x}{3}+\frac{2\log\left(e^{2x}+3\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-1+exp(2*x))/(3+exp(2*x)),x)
[Out] -x/3 + 2*log(exp(2*x) + 3)/3
```

Giac [A]
time = 5.56, size = 13, normalized size = 0.72

$$-\frac{1}{3}\,x+\frac{2}{3}\,\log\left(e^{(2\,x)}+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-1+exp(2*x))/(3+exp(2*x)),x, algorithm="giac")
[Out] -1/3*x + 2/3*log(e^(2*x) + 3)
```

Mupad [B]
time = 0.08, size = 13, normalized size = 0.72

$$\frac{2\,\ln\left(\mathrm{e}^{2\,x}+3\right)}{3}-\frac{x}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(2*x) - 1)/(exp(2*x) + 3),x)
[Out] (2*log(exp(2*x) + 3))/3 - x/3
```

3.648 $\int \frac{e^x}{\sqrt{1-e^{2x}}} dx$

Optimal. Leaf size=4

$$\sin^{-1}(e^x)$$

```
[Out] arcsin(exp(x))
```

Rubi [A]
time = 0.01, antiderivative size = 4, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$, Rules used = {2281, 222}

$$\text{ArcSin}(e^x)$$

Antiderivative was successfully verified.

```
[In] Int[E^x/Sqrt[1 - E^(2*x)],x]
```

```
[Out] ArcSin[E^x]
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned} \int \frac{e^x}{\sqrt{1-e^{2x}}} dx &= \text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}} dx, x, e^x\right) \\ &= \sin^{-1}(e^x) \end{aligned}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 18 vs. 2(4) = 8.
time = 0.03, size = 18, normalized size = 4.50

$$\tan^{-1}\left(\frac{e^x}{\sqrt{1-e^{2x}}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/Sqrt[1 - E^(2*x)],x]
```

```
[Out] ArcTan[E^x/Sqrt[1 - E^(2*x)]]
```

Maple [A]
time = 0.02, size = 4, normalized size = 1.00

method	result	size
default	$\arcsin(e^x)$	4

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(1-exp(2*x))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] arcsin(exp(x))
```

Maxima [A]
time = 0.51, size = 3, normalized size = 0.75

$$\arcsin\left(e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1-exp(2*x))^(1/2),x, algorithm="maxima")
```

```
[Out] arcsin(e^x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 20 vs. 2(3) = 6.
time = 0.36, size = 20, normalized size = 5.00

$$-2 \arctan\left(\left(\sqrt{-e^{(2x)}+1}-1\right)e^{(-x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1-exp(2*x))^(1/2),x, algorithm="fricas")
```

```
[Out] -2*arctan((sqrt(-e^(2*x) + 1) - 1)*e^(-x))
```

Sympy [A]
time = 0.35, size = 3, normalized size = 0.75

$$\operatorname{asin}\left(e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1-exp(2*x))**(1/2),x)
```

```
[Out] asin(exp(x))
```

Giac [A]
time = 4.53, size = 3, normalized size = 0.75

$$\arcsin\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1-exp(2*x))^(1/2),x, algorithm="giac")
```

```
[Out] arcsin(e^x)
```

Mupad [B]
time = 3.53, size = 3, normalized size = 0.75

$$\mathrm{asin}(\mathrm{e}^{x})$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(1 - exp(2*x))^(1/2),x)
```

```
[Out] asin(exp(x))
```

3.649 $\int \frac{e^{2x}}{1+e^{4x}}\,dx$

Optimal. Leaf size=10

$$\frac{1}{2}\tan^{-1}\left(e^{2x}\right)$$

```
[Out] 1/2*arctan(exp(2*x))
```

Rubi [A]
time = 0.01, antiderivative size = 10, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {2281, 209}

$$\frac{1}{2}\text{ArcTan}\left(e^{2x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^(2*x)/(1 + E^(4*x)),x]
```

```
[Out] ArcTan[E^(2*x)]/2
```

Rule 209

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[b, 2]))*A
rcTan[Rt[b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{2x}}{1+e^{4x}}\,dx &= \frac{1}{2}\text{Subst}\left(\int \frac{1}{1+x^2}\,dx,x,e^{2x}\right)\\ &= \frac{1}{2}\tan^{-1}\left(e^{2x}\right)\end{aligned}$$

Mathematica [A]
time = 0.02, size = 10, normalized size = 1.00

$$\frac{1}{2}\tan^{-1}\left(e^{2x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(2*x)/(1 + E^(4*x)),x]
```

```
[Out] ArcTan[E^(2*x)]/2
```

Maple [A]
time = 0.02, size = 8, normalized size = 0.80

method	result	size
default	$\frac{\arctan\left(e^{2x}\right)}{2}$	8
risch	$\frac{i\ln\left(e^{2x}+i\right)}{4}-\frac{i\ln\left(e^{2x}-i\right)}{4}$	24

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(1+exp(4*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*arctan(exp(x)^2)
```

Maxima [A]
time = 0.51, size = 7, normalized size = 0.70

$$\frac{1}{2}\arctan\left(e^{(2x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(4*x)),x, algorithm="maxima")
```

```
[Out] 1/2*arctan(e^(2*x))
```

Fricas [A]
time = 0.36, size = 7, normalized size = 0.70

$$\frac{1}{2}\arctan\left(e^{(2x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(4*x)),x, algorithm="fricas")
```

```
[Out] 1/2*arctan(e^(2*x))
```

Sympy [**B**] Leaf count of result is larger than twice the leaf count of optimal. 17 vs. $2(7) = 14$.
time = 0.04, size = 17, normalized size = 1.70

$$\text{RootSum}\left(16z^2 + 1, \left(i \mapsto i \log\left(4i + e^{2x}\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(4*x)),x)
```

```
[Out] RootSum(16*_z**2 + 1, Lambda(_i, _i*log(4*_i + exp(2*x))))
```

Giac [**A**]
time = 2.79, size = 7, normalized size = 0.70

$$\frac{1}{2} \arctan\left(e^{(2x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(4*x)),x, algorithm="giac")
```

```
[Out] 1/2*arctan(e^(2*x))
```

Mupad [**B**]
time = 3.37, size = 7, normalized size = 0.70

$$\frac{\mathrm{atan}(\mathrm{e}^{2x})}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(exp(4*x) + 1),x)
```

```
[Out] atan(exp(2*x))/2
```

3.650 $\int \frac{1}{-3e^x+e^{2x}}\,dx$

Optimal. Leaf size=27

$$\frac{e^{-x}}{3}-\frac{x}{9}+\frac{1}{9}\log\left(3-e^x\right)$$

```
[Out] 1/3/exp(x)-1/9*x+1/9*ln(3-exp(x))
```

Rubi [A]
time = 0.01, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2320, 46}

$$-\frac{x}{9}+\frac{e^{-x}}{3}+\frac{1}{9}\log\left(3-e^x\right)$$

Antiderivative was successfully verified.

```
[In] Int[(-3*E^x + E^(2*x))^(-1),x]
```

```
[Out] 1/(3*E^x) - x/9 + Log[3 - E^x]/9
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{-3e^x+e^{2x}}\,dx &= \text{Subst}\left(\int \frac{1}{(-3+x)x^2}\,dx,x,e^x\right)\\ &= \text{Subst}\left(\int \left(\frac{1}{9(-3+x)}-\frac{1}{3x^2}-\frac{1}{9x}\right)\,dx,x,e^x\right)\\ &= \frac{e^{-x}}{3}-\frac{x}{9}+\frac{1}{9}\log\left(3-e^x\right)\end{aligned}$$

Mathematica [A]
time = 0.02, size = 24, normalized size = 0.89

$$\frac{1}{9}\left(3e^{-x}-\log\left(e^{x}\right)+\log\left(-3+e^{x}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(-3*E^x + E^(2*x))^(-1),x]
```

```
[Out] (3/E^x - Log[E^x] + Log[-3 + E^x])/9
```

Maple [A]
time = 0.03, size = 20, normalized size = 0.74

method	result	size
risch	$\frac{e^{-x}}{3}-\frac{x}{9}+\frac{\ln(e^{x}-3)}{9}$	18
default	$\frac{e^{-x}}{3}-\frac{\ln(e^{x})}{9}+\frac{\ln(e^{x}-3)}{9}$	20
norman	$\left(\frac{1}{3}-\frac{e^{x}x}{9}\right)e^{-x}+\frac{\ln(e^{x}-3)}{9}$	21

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-3*exp(x)+exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/3/exp(x)-1/9*ln(exp(x))+1/9*ln(exp(x)-3)
```

Maxima [A]
time = 0.28, size = 17, normalized size = 0.63

$$-\frac{1}{9}\,x+\frac{1}{3}\,e^{(-x)}+\frac{1}{9}\,\log\left(e^{x}-3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-3*exp(x)+exp(2*x)),x, algorithm="maxima")
```

```
[Out] -1/9*x + 1/3*e^(-x) + 1/9*log(e^x - 3)
```

Fricas [A]
time = 0.40, size = 21, normalized size = 0.78

$$-\frac{1}{9}\left(xe^{x}-e^{x}\log\left(e^{x}-3\right)-3\right)e^{(-x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-3*exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] -1/9*(x*e^x - e^x*log(e^x - 3) - 3)*e^(-x)
```

Sympy [A]
time = 0.03, size = 17, normalized size = 0.63

$$-\frac{x}{9} + \frac{\log\left(e^{x} - 3\right)}{9} + \frac{e^{-x}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-3*exp(x)+exp(2*x)),x)
```

```
[Out] -x/9 + log(exp(x) - 3)/9 + exp(-x)/3
```

Giac [A]
time = 3.15, size = 18, normalized size = 0.67

$$-\frac{1}{9}\,x + \frac{1}{3}\,e^{(-x)} + \frac{1}{9}\,\log\left(|e^{x} - 3|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-3*exp(x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] -1/9*x + 1/3*e^(-x) + 1/9*log(abs(e^x - 3))
```

Mupad [B]
time = 0.07, size = 17, normalized size = 0.63

$$\frac{\mathrm{e}^{-x}}{3} - \frac{x}{9} + \frac{\ln\left(\mathrm{e}^{x} - 3\right)}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(exp(2*x) - 3*exp(x)),x)
```

```
[Out] exp(-x)/3 - x/9 + log(exp(x) - 3)/9
```

3.651 $\int \frac{e^x(-2+e^x)}{1+e^x} \, dx$

Optimal. Leaf size=12

$$e^x - 3\log(1+e^x)$$

[Out] exp(x)-3*ln(1+exp(x))

Rubi [A]
time = 0.02, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {2320, 45}

$$e^x - 3\log(e^x+1)$$

Antiderivative was successfully verified.

[In] Int[(E^x*(-2 + E^x))/(1 + E^x),x]

[Out] E^x - 3*Log[1 + E^x]

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}
\int \frac{e^x(-2+e^x)}{1+e^x} \, dx &= \text{Subst}\left(\int \frac{-2+x}{1+x} \, dx, x, e^x\right) \\
&= \text{Subst}\left(\int \left(1-\frac{3}{1+x}\right) \, dx, x, e^x\right) \\
&= e^x - 3\log(1+e^x)
\end{aligned}$$

Mathematica [A]
time = 0.01, size = 12, normalized size = 1.00

$$e^x - 3\log(1 + e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^x*(-2 + E^x))/(1 + E^x),x]
[Out] E^x - 3*Log[1 + E^x]
```

Maple [A]
time = 0.01, size = 11, normalized size = 0.92

method	result	size
derivativedivides	$e^x - 3\ln(1 + e^x)$	11
default	$e^x - 3\ln(1 + e^x)$	11
norman	$e^x - 3\ln(1 + e^x)$	11
risch	$e^x - 3\ln(1 + e^x)$	11

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(-2+exp(x))/(1+exp(x)),x,method=_RETURNVERBOSE)
[Out] exp(x)-3*ln(1+exp(x))
```

Maxima [A]
time = 0.28, size = 10, normalized size = 0.83

$$e^x - 3\log(e^x + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-2+exp(x))/(1+exp(x)),x, algorithm="maxima")
[Out] e^x - 3*log(e^x + 1)
```

Fricas [A]
time = 0.38, size = 10, normalized size = 0.83

$$e^x - 3\log(e^x + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-2+exp(x))/(1+exp(x)),x, algorithm="fricas")
[Out] e^x - 3*log(e^x + 1)
```

Sympy [A]
time = 0.02, size = 10, normalized size = 0.83

$$e^{x} - 3\log\left(e^{x} + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-2+exp(x))/(1+exp(x)),x)
```

```
[Out] exp(x) - 3*log(exp(x) + 1)
```

Giac [A]
time = 4.56, size = 10, normalized size = 0.83

$$e^{x} - 3 \log\left(e^{x} + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-2+exp(x))/(1+exp(x)),x, algorithm="giac")
```

```
[Out] e^x - 3*log(e^x + 1)
```

Mupad [B]
time = 3.33, size = 10, normalized size = 0.83

$$\mathrm{e}^{x} - 3 \ln\left(\mathrm{e}^{x} + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(x)*(exp(x) - 2))/(exp(x) + 1),x)
```

```
[Out] exp(x) - 3*log(exp(x) + 1)
```

3.652 $\int \frac{e^x}{-1+e^{2x}} \, dx$

Optimal. Leaf size=6

$$-\tanh^{-1}(e^x)$$

[Out] -arctanh(exp(x))

Rubi [A]
time = 0.01, antiderivative size = 6, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2281, 213}

$$-\tanh^{-1}(e^x)$$

Antiderivative was successfully verified.

[In] Int[E^x/(-1 + E^(2*x)),x]

[Out] -ArcTanh[E^x]

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^x}{-1+e^{2x}} \, dx &= \text{Subst}\left(\int \frac{1}{-1+x^2} \, dx, x, e^x\right)\\ &= -\tanh^{-1}(e^x)\end{aligned}$$

Mathematica [A]
time = 0.02, size = 6, normalized size = 1.00

$$-\tanh^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(-1 + E^(2*x)),x]
```

```
[Out] -ArcTanh[E^x]
```

Maple [A]
time = 0.02, size = 6, normalized size = 1.00

method	result	size
default	$-\operatorname{arctanh}\left(e^{x}\right)$	6
norman	$\frac{\ln(-1+e^{x})}{2}-\frac{\ln(1+e^{x})}{2}$	16
risch	$\frac{\ln(-1+e^{x})}{2}-\frac{\ln(1+e^{x})}{2}$	16

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(-1+exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -arctanh(exp(x))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 15 vs. $2(5) = 10$.
time = 0.29, size = 15, normalized size = 2.50

$$-\frac{1}{2}\log\left(e^{x}+1\right)+\frac{1}{2}\log\left(e^{x}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-1+exp(2*x)),x, algorithm="maxima")
```

```
[Out] -1/2*log(e^x + 1) + 1/2*log(e^x - 1)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 15 vs. $2(5) = 10$.
time = 0.36, size = 15, normalized size = 2.50

$$-\frac{1}{2}\log\left(e^{x}+1\right)+\frac{1}{2}\log\left(e^{x}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-1+exp(2*x)),x, algorithm="fricas")
```

```
[Out] -1/2*log(e^x + 1) + 1/2*log(e^x - 1)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 15 vs. $2(5) = 10$.
time = 0.03, size = 15, normalized size = 2.50

$$\frac{\log\left(e^{x}-1\right)}{2}-\frac{\log\left(e^{x}+1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-1+exp(2*x)),x)
```

```
[Out] log(exp(x) - 1)/2 - log(exp(x) + 1)/2
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 16 vs. $2(5) = 10$.
time = 3.23, size = 16, normalized size = 2.67

$$-\frac{1}{2}\log\left(e^{x}+1\right)+\frac{1}{2}\log\left(\left|e^{x}-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-1+exp(2*x)),x, algorithm="giac")
```

```
[Out] -1/2*log(e^x + 1) + 1/2*log(abs(e^x - 1))
```

Mupad [B]
time = 0.08, size = 15, normalized size = 2.50

$$\frac{\ln\left(\mathrm{e}^{x}-1\right)}{2}-\frac{\ln\left(\mathrm{e}^{x}+1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(2*x) - 1),x)
```

```
[Out] log(exp(x) - 1)/2 - log(exp(x) + 1)/2
```

3.653 $\int \frac{e^x}{1+e^{2x}}\,dx$

Optimal. Leaf size=4

$$\tan^{-1}(e^x)$$

[Out] arctan(exp(x))

Rubi [A]
time = 0.01, antiderivative size = 4, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2281, 209}

$$\text{ArcTan}(e^x)$$

Antiderivative was successfully verified.

[In] Int[E^x/(1 + E^(2*x)),x]

[Out] ArcTan[E^x]

Rule 209

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[b, 2]))*A
rcTan[Rt[b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^x}{1+e^{2x}}\,dx &= \text{Subst}\left(\int \frac{1}{1+x^2}\,dx, x, e^x\right)\\ &= \tan^{-1}(e^x)\end{aligned}$$

Mathematica [A]
time = 0.00, size = 4, normalized size = 1.00

$$\tan^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(1 + E^(2*x)),x]
```

```
[Out] ArcTan[E^x]
```

Maple [A]
time = 0.01, size = 4, normalized size = 1.00

method	result	size
default	$\arctan\left(\mathrm{e}^{x}\right)$	4
risch	$\frac{i \ln\left(\mathrm{e}^{x}+i\right)}{2}-\frac{i \ln\left(\mathrm{e}^{x}-i\right)}{2}$	20

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(1+exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] arctan(exp(x))
```

Maxima [A]
time = 0.51, size = 3, normalized size = 0.75

$$\arctan\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(2*x)),x, algorithm="maxima")
```

```
[Out] arctan(e^x)
```

Fricas [A]
time = 0.38, size = 3, normalized size = 0.75

$$\arctan\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(2*x)),x, algorithm="fricas")
```

```
[Out] arctan(e^x)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 15 vs. $2(3) = 6$.
time = 0.03, size = 15, normalized size = 3.75

$$\operatorname{RootSum}\left(4z^{2}+1, \left(i \mapsto i \log\left(2i+e^{x}\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(2*x)),x)
```

```
[Out] RootSum(4*_z**2 + 1, Lambda(_i, _i*log(2*_i + exp(x))))
```

Giac [A]
time = 5.78, size = 3, normalized size = 0.75

$$\arctan\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(2*x)),x, algorithm="giac")
```

```
[Out] arctan(e^x)
```

Mupad [B]
time = 0.05, size = 3, normalized size = 0.75

$$\mathrm{atan}(\mathrm{e}^{x})$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(2*x) + 1),x)
```

```
[Out] atan(exp(x))
```

3.654 $\int \frac{e^{-x}+e^x}{-e^{-x}+e^x}\,dx$

Optimal. Leaf size=12

$$\log \left(e^{-x}-e^x\right)$$

[Out] ln(exp(-x)-exp(x))

Rubi [A]

time = 0.03, antiderivative size = 14, normalized size of antiderivative = 1.17, number of steps used = 4, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.130$, Rules used = {2320, 457, 78}

$$\log \left(1-e^{2x}\right)-x$$

Antiderivative was successfully verified.

[In] Int[(E^(-x) + E^x)/(-E^(-x) + E^x),x]

[Out] -x + Log[1 - E^(2*x)]

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{e^{-x}+e^x}{-e^{-x}+e^x}\,dx = \text{Subst}\left(\int \frac{-1-x^2}{x\,(1-x^2)}\,dx, x, e^x\right)$$
$$= \frac{1}{2}\text{Subst}\left(\int \frac{-1-x}{(1-x)x}\,dx, x, e^{2x}\right)$$
$$= \frac{1}{2}\text{Subst}\left(\int \left(\frac{2}{-1+x}-\frac{1}{x}\right)\,dx, x, e^{2x}\right)$$
$$= -x+\log\left(1-e^{2x}\right)$$

Mathematica [A]
time = 0.03, size = 17, normalized size = 1.42

$$2\tanh^{-1}\left(1-2e^x\right)+\log\left(1+e^x\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(-x) + E^x)/(-E^(-x) + E^x),x]
```

```
[Out] 2*ArcTanh[1 - 2*E^x] + Log[1 + E^x]
```

Maple [A]
time = 0.02, size = 17, normalized size = 1.42

method	result	size
risch	$-x+\ln\left(-1+e^{2x}\right)$	12
norman	$-x+\ln\left(-1+e^{x}\right)+\ln\left(1+e^{x}\right)$	15
default	$\ln\left(1+e^{x}\right)-\ln\left(e^{x}\right)+\ln\left(-1+e^{x}\right)$	17

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(-x)+exp(x))/(-1/exp(x)+exp(x)),x,method=_RETURNVERBOSE)
```

```
[Out] ln(1+exp(x))-ln(exp(x))+ln(-1+exp(x))
```

Maxima [A]
time = 0.28, size = 10, normalized size = 0.83

$$\log\left(e^{(-x)}-e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-x)+exp(x))/(-1/exp(x)+exp(x)),x, algorithm="maxima")
```

```
[Out] log(e^(-x) - e^x)
```

Fricas [A]
time = 0.38, size = 11, normalized size = 0.92

$$-x + \log\left(e^{(2x)} - 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-x)+exp(x))/(-1/exp(x)+exp(x)),x, algorithm="fricas")
[Out] -x + log(e^(2*x) - 1)
```

Sympy [A]
time = 0.03, size = 8, normalized size = 0.67

$$-x + \log\left(e^{2x} - 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-x)+exp(x))/(-1/exp(x)+exp(x)),x)
[Out] -x + log(exp(2*x) - 1)
```

Giac [A]
time = 5.22, size = 12, normalized size = 1.00

$$-x + \log\left(\left|e^{(2x)} - 1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-x)+exp(x))/(-1/exp(x)+exp(x)),x, algorithm="giac")
[Out] -x + log(abs(e^(2*x) - 1))
```

Mupad [B]
time = 0.06, size = 11, normalized size = 0.92

$$\ln\left(e^{2x} - 1\right) - x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(exp(-x) + exp(x))/(exp(-x) - exp(x)),x)
[Out] log(exp(2*x) - 1) - x
```

3.655 $\int \frac{-e^{-x}+e^x}{e^{-x}+e^x} dx$

Optimal. Leaf size=10

$$\log \left(e^{-x}+e^x\right)$$

[Out] ln(exp(-x)+exp(x))

Rubi [A]

time = 0.02, antiderivative size = 12, normalized size of antiderivative = 1.20, number of steps used = 4, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {2320, 457, 78}

$$\log \left(e^{2x}+1\right)-x$$

Antiderivative was successfully verified.

[In] Int[(-E^(-x) + E^x)/(E^(-x) + E^x),x]

[Out] -x + Log[1 + E^(2*x)]

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{-e^{-x}+e^x}{e^{-x}+e^x}\,dx = \text{Subst}\left(\int \frac{-1+x^2}{x\,(1+x^2)}\,dx, x, e^x\right)$$
$$= \frac{1}{2}\text{Subst}\left(\int \frac{-1+x}{x(1+x)}\,dx, x, e^{2x}\right)$$
$$= \frac{1}{2}\text{Subst}\left(\int \left(-\frac{1}{x}+\frac{2}{1+x}\right)\,dx, x, e^{2x}\right)$$
$$= -x+\log\left(1+e^{2x}\right)$$

Mathematica [A]
time = 0.02, size = 15, normalized size = 1.50

$$-\log\left(e^x\right)+\log\left(1+e^{2x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(-E^(-x) + E^x)/(E^(-x) + E^x),x]
[Out] -Log[E^x] + Log[1 + E^(2*x)]
```

Maple [A]
time = 0.02, size = 14, normalized size = 1.40

method	result	size
norman	$-x+\ln\left(1+e^{2x}\right)$	12
risch	$-x+\ln\left(1+e^{2x}\right)$	12
default	$\ln\left(1+e^{2x}\right)-\ln\left(e^{x}\right)$	14

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-1/exp(x)+exp(x))/(exp(-x)+exp(x)),x,method=_RETURNVERBOSE)
[Out] ln(1+exp(x)^2)-ln(exp(x))
```

Maxima [A]
time = 0.29, size = 8, normalized size = 0.80

$$\log\left(e^{(-x)}+e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-1/exp(x)+exp(x))/(exp(-x)+exp(x)),x, algorithm="maxima")
[Out] log(e^(-x) + e^x)
```

Fricas [A]
time = 0.36, size = 11, normalized size = 1.10

$$-x + \log\left(e^{(2\,x)} + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-1/exp(x)+exp(x))/(exp(-x)+exp(x)),x, algorithm="fricas")
```

```
[Out] -x + log(e^(2*x) + 1)
```

Sympy [A]
time = 0.03, size = 8, normalized size = 0.80

$$-x + \log\left(e^{2x} + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-1/exp(x)+exp(x))/(exp(-x)+exp(x)),x)
```

```
[Out] -x + log(exp(2*x) + 1)
```

Giac [A]
time = 4.08, size = 11, normalized size = 1.10

$$-x + \log\left(e^{(2\,x)} + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-1/exp(x)+exp(x))/(exp(-x)+exp(x)),x, algorithm="giac")
```

```
[Out] -x + log(e^(2*x) + 1)
```

Mupad [B]
time = 3.54, size = 11, normalized size = 1.10

$$\ln\left(\mathrm{e}^{2\,x} + 1\right) - x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(exp(-x) - exp(x))/(exp(-x) + exp(x)),x)
```

```
[Out] log(exp(2*x) + 1) - x
```

3.656 $\int \frac{e^{-2x}+e^{2x}}{-e^{-2x}+e^{2x}} \, dx$

Optimal. Leaf size=18

$$-x+\frac{1}{2}\log\left(1-e^{4x}\right)$$

```
[Out] -x+1/2*ln(1-exp(4*x))
```

Rubi [A]
time = 0.03, antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2320, 457, 78}

$$\frac{1}{2}\log\left(1-e^{4x}\right)-x$$

Antiderivative was successfully verified.

```
[In] Int[(E^(-2*x) + E^(2*x))/(-E^(-2*x) + E^(2*x)),x]
```

```
[Out] -x + Log[1 - E^(4*x)]/2
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 457

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{e^{-2x}+e^{2x}}{-e^{-2x}+e^{2x}}\,dx = \frac{1}{2}\text{Subst}\left(\int \frac{-1-x^2}{x(1-x^2)}\,dx, x, e^{2x}\right)$$
$$= \frac{1}{4}\text{Subst}\left(\int \frac{-1-x}{(1-x)x}\,dx, x, e^{4x}\right)$$
$$= \frac{1}{4}\text{Subst}\left(\int \left(\frac{2}{-1+x}-\frac{1}{x}\right)dx, x, e^{4x}\right)$$
$$= -x+\frac{1}{2}\log\left(1-e^{4x}\right)$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 39 vs. 2(18) = 36.
time = 0.04, size = 39, normalized size = 2.17

$$-\log(e^x)+\frac{1}{2}\log(-1+e^x)+\frac{1}{2}\log(1+e^x)+\frac{1}{2}\log\left(1+e^{2x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(-2*x) + E^(2*x))/(-E^(-2*x) + E^(2*x)),x]
[Out] -Log[E^x] + Log[-1 + E^x]/2 + Log[1 + E^x]/2 + Log[1 + E^(2*x)]/2
```

Maple [A]
time = 0.02, size = 30, normalized size = 1.67

method	result	size
risch	$x+\frac{\ln(e^{-4x}-1)}{2}$	12
norman	$x+\frac{\ln(-1+e^{-2x})}{2}+\frac{\ln(e^{-2x}+1)}{2}$	21
default	$\frac{\ln(1+e^x)}{2}-\ln(e^x)+\frac{\ln(-1+e^x)}{2}+\frac{\ln(1+e^{2x})}{2}$	30

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(-2*x)+exp(2*x))/(-1/exp(2*x)+exp(2*x)),x,method=_RETURNVERBOSE)
[Out] 1/2*ln(1+exp(x))-ln(exp(x))+1/2*ln(-1+exp(x))+1/2*ln(1+exp(x)^2)
```

Maxima [A]
time = 0.30, size = 14, normalized size = 0.78

$$\frac{1}{2}\log\left(e^{(2x)}-e^{(-2x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-2*x)+exp(2*x))/(-1/exp(2*x)+exp(2*x)),x, algorithm="maxima"
)
```

```
[Out] 1/2*log(e^(2*x) - e^(-2*x))
```

Fricas [A]
time = 0.38, size = 13, normalized size = 0.72

$$-x+\frac{1}{2}\log\left(e^{(4x)}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-2*x)+exp(2*x))/(-1/exp(2*x)+exp(2*x)),x, algorithm="fricas"
)
```

```
[Out] -x + 1/2*log(e^(4*x) - 1)
```

Sympy [A]
time = 0.03, size = 12, normalized size = 0.67

$$x+\frac{\log\left(-1+e^{-4x}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-2*x)+exp(2*x))/(-1/exp(2*x)+exp(2*x)),x)
```

```
[Out] x + log(-1 + exp(-4*x))/2
```

Giac [A]
time = 4.93, size = 14, normalized size = 0.78

$$-x+\frac{1}{2}\log\left(\left|e^{(4x)}-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-2*x)+exp(2*x))/(-1/exp(2*x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] -x + 1/2*log(abs(e^(4*x) - 1))
```

Mupad [B]
time = 3.34, size = 22, normalized size = 1.22

$$\frac{\ln\left(\mathrm{e}^{2x}-1\right)}{2}-x+\frac{\ln\left(\mathrm{e}^{2x}+1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(exp(-2*x) + exp(2*x))/(exp(-2*x) - exp(2*x)),x)
```

```
[Out] log(exp(2*x) - 1)/2 - x + log(exp(2*x) + 1)/2
```

3.657 $\int \frac{e^x}{\sqrt{1+e^{2x}}} \, dx$

Optimal. Leaf size=4

$$\sinh^{-1}\left(e^x\right)$$

```
[Out] arcsinh(exp(x))
```

Rubi [A]
time = 0.01, antiderivative size = 4, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {2281, 221}

$$\sinh^{-1}\left(e^x\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^x/Sqrt[1 + E^(2*x)],x]
```

```
[Out] ArcSinh[E^x]
```

Rule 221

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[Rt[b, 2]*(x/Sqrt
[a])]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned} \int \frac{e^x}{\sqrt{1+e^{2x}}} \, dx &= \text{Subst}\left(\int \frac{1}{\sqrt{1+x^2}} \, dx, x, e^x\right) \\ &= \sinh^{-1}\left(e^x\right) \end{aligned}$$

Mathematica [B] Leaf count is larger than twice the leaf count of optimal. 16 vs. 2(4) = 8.
time = 0.02, size = 16, normalized size = 4.00

$$\tanh^{-1}\left(\frac{e^x}{\sqrt{1+e^{2x}}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/Sqrt[1 + E^(2*x)],x]
```

```
[Out] ArcTanh[E^x/Sqrt[1 + E^(2*x)]]
```

Maple [A]
time = 0.02, size = 4, normalized size = 1.00

method	result	size
default	$\operatorname{arcsinh}(e^x)$	4

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(1+exp(2*x))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] arcsinh(exp(x))
```

Maxima [A]
time = 0.52, size = 3, normalized size = 0.75

$$\operatorname{arsinh}(e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(2*x))^(1/2),x, algorithm="maxima")
```

```
[Out] arcsinh(e^x)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 16 vs. 2(3) = 6.
time = 0.37, size = 16, normalized size = 4.00

$$-\log\left(\sqrt{e^{(2x)}+1}-e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(2*x))^(1/2),x, algorithm="fricas")
```

```
[Out] -log(sqrt(e^(2*x) + 1) - e^x)
```

Sympy [A]
time = 0.31, size = 3, normalized size = 0.75

$$\operatorname{asinh}(e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(2*x))**(1/2),x)
```

```
[Out] asinh(exp(x))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 16 vs. $2(3) = 6$.
time = 4.92, size = 16, normalized size = 4.00

$$-\log\left(\sqrt{e^{(2x)}+1}-e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(2*x))^(1/2),x, algorithm="giac")
```

```
[Out] -log(sqrt(e^(2*x) + 1) - e^x)
```

Mupad [B]
time = 0.08, size = 3, normalized size = 0.75

$$\operatorname{asinh}(e^{x})$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(2*x) + 1)^(1/2),x)
```

```
[Out] asinh(exp(x))
```

3.658 $\int \frac{e^{\sqrt{4+x}}}{\sqrt{4+x}}\,dx$

Optimal. Leaf size=11

$$2e^{\sqrt{4+x}}$$

[Out] 2*exp((4+x)^(1/2))

Rubi [A]
time = 0.02, antiderivative size = 11, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.059$, Rules used = {2240}

$$2e^{\sqrt{x+4}}$$

Antiderivative was successfully verified.

[In] Int[E^Sqrt[4 + x]/Sqrt[4 + x],x]

[Out] 2*E^Sqrt[4 + x]

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{e^{\sqrt{4+x}}}{\sqrt{4+x}}\,dx = 2e^{\sqrt{4+x}}$$

Mathematica [A]
time = 0.00, size = 11, normalized size = 1.00

$$2e^{\sqrt{4+x}}$$

Antiderivative was successfully verified.

[In] Integrate[E^Sqrt[4 + x]/Sqrt[4 + x],x]

[Out] 2*E^Sqrt[4 + x]

Maple [A]
time = 0.06, size = 9, normalized size = 0.82

method	result	size
derivativedivides	$2\,\mathrm{e}^{\sqrt{4+x}}$	9
default	$2\,\mathrm{e}^{\sqrt{4+x}}$	9

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((4+x)^(1/2))/(4+x)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2*exp((4+x)^(1/2))
```

Maxima [A]
time = 0.30, size = 8, normalized size = 0.73

$$2\,e^{\left(\sqrt{x+4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((4+x)^(1/2))/(4+x)^(1/2),x, algorithm="maxima")
```

```
[Out] 2*e^(sqrt(x + 4))
```

Fricas [A]
time = 0.38, size = 8, normalized size = 0.73

$$2\,e^{\left(\sqrt{x+4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((4+x)^(1/2))/(4+x)^(1/2),x, algorithm="fricas")
```

```
[Out] 2*e^(sqrt(x + 4))
```

Sympy [A]
time = 0.07, size = 8, normalized size = 0.73

$$2e^{\sqrt{x+4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((4+x)**(1/2))/(4+x)**(1/2),x)
```

```
[Out] 2*exp(sqrt(x + 4))
```

Giac [A]
time = 4.25, size = 8, normalized size = 0.73

$$2\,e^{\left(\sqrt{x+4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((4+x)^(1/2))/(4+x)^(1/2),x, algorithm="giac")
```

```
[Out] 2*e^(sqrt(x + 4))
```

Mupad [B]
time = 3.46, size = 8, normalized size = 0.73

$$2\,\mathrm{e}^{\sqrt{x+4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((x + 4)^(1/2))/(x + 4)^(1/2),x)
```

```
[Out] 2*exp((x + 4)^(1/2))
```

3.659 $\int \frac{x}{\sqrt{-1+e^{2x^2}}}\,dx$

Optimal. Leaf size=18

$$\frac{1}{2}\tan^{-1}\left(\sqrt{-1+e^{2x^2}}\right)$$

[Out] 1/2*arctan((-1+exp(2*x^2))^(1/2))

Rubi [A]
time = 0.04, antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$, Rules used = {6847, 2320, 65, 209}

$$\frac{1}{2}\text{ArcTan}\left(\sqrt{e^{2x^2}-1}\right)$$

Antiderivative was successfully verified.

[In] Int[x/Sqrt[-1 + E^(2*x^2)],x]

[Out] ArcTan[Sqrt[-1 + E^(2*x^2)]]/2

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 209

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[b, 2]))*A
rcTan[Rt[b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6847

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
```

```
fQ[x^(m + 1), u, x]
```

Rubi steps

$$\begin{aligned}\int \frac{x}{\sqrt{-1+e^{2x^2}}}\,dx &= \frac{1}{2}\text{Subst}\left(\int \frac{1}{\sqrt{-1+e^{2x}}}\,dx, x, x^2\right)\\ &= \frac{1}{4}\text{Subst}\left(\int \frac{1}{\sqrt{-1+x}\,x}\,dx, x, e^{2x^2}\right)\\ &= \frac{1}{2}\text{Subst}\left(\int \frac{1}{1+x^2}\,dx, x, \sqrt{-1+e^{2x^2}}\right)\\ &= \frac{1}{2}\tan^{-1}\left(\sqrt{-1+e^{2x^2}}\right)\end{aligned}$$

Mathematica [A]
time = 0.03, size = 18, normalized size = 1.00

$$\frac{1}{2}\tan^{-1}\left(\sqrt{-1+e^{2x^2}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x/Sqrt[-1 + E^(2*x^2)],x]
[Out] ArcTan[Sqrt[-1 + E^(2*x^2)]]/2
```

Maple [A]
time = 0.04, size = 14, normalized size = 0.78

method	result	size
derivativedivides	$\frac{\arctan\left(\sqrt{-1+e^{2x^2}}\right)}{2}$	14
default	$\frac{\arctan\left(\sqrt{-1+e^{2x^2}}\right)}{2}$	14

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(-1+exp(2*x^2))^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/2*arctan((-1+exp(2*x^2))^(1/2))
```

Maxima [A]
time = 0.50, size = 13, normalized size = 0.72

$$\frac{1}{2}\arctan\left(\sqrt{e^{(2x^2)}-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-1+exp(2*x^2))^(1/2),x, algorithm="maxima")
[Out] 1/2*arctan(sqrt(e^(2*x^2) - 1))
```

Fricas [A]
time = 0.37, size = 13, normalized size = 0.72

$$\frac{1}{2}\arctan\left(\sqrt{e^{(2x^2)}-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-1+exp(2*x^2))^(1/2),x, algorithm="fricas")
[Out] 1/2*arctan(sqrt(e^(2*x^2) - 1))
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{x}{\sqrt{(e^{x^2}-1)(e^{x^2}+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-1+exp(2*x**2))**(1/2),x)
[Out] Integral(x/sqrt((exp(x**2) - 1)*(exp(x**2) + 1)), x)
```

Giac [A]
time = 4.97, size = 13, normalized size = 0.72

$$\frac{1}{2}\arctan\left(\sqrt{e^{(2x^2)}-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-1+exp(2*x^2))^(1/2),x, algorithm="giac")
[Out] 1/2*arctan(sqrt(e^(2*x^2) - 1))
```

Mupad [B]
time = 3.71, size = 13, normalized size = 0.72

$$\frac{\operatorname{atan}\left(\sqrt{e^{2x^2}-1}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(exp(2*x^2) - 1)^(1/2),x)
[Out] atan((exp(2*x^2) - 1)^(1/2))/2
```

3.660 $\int e^x \sqrt{9+e^{2x}}\,dx$

Optimal. Leaf size=31

$$\frac{1}{2}e^x\sqrt{9+e^{2x}}+\frac{9}{2}\sinh^{-1}\left(\frac{e^x}{3}\right)$$

```
[Out] 9/2*arcsinh(1/3*exp(x))+1/2*exp(x)*(9+exp(2*x))^(1/2)
```

Rubi [A]
time = 0.02, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2281, 201, 221}

$$\frac{1}{2}e^x\sqrt{e^{2x}+9}+\frac{9}{2}\sinh^{-1}\left(\frac{e^x}{3}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^x*Sqrt[9 + E^(2*x)],x]
```

```
[Out] (E^x*Sqrt[9 + E^(2*x)])/2 + (9*ArcSinh[E^x/3])/2
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 221

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[Rt[b, 2]*(x/Sqrt
[a])]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int e^x\sqrt{9+e^{2x}}\,dx = \text{Subst}\left(\int \sqrt{9+x^2}\,dx, x, e^x\right)$$
$$= \frac{1}{2}e^x\sqrt{9+e^{2x}} + \frac{9}{2}\text{Subst}\left(\int \frac{1}{\sqrt{9+x^2}}\,dx, x, e^x\right)$$
$$= \frac{1}{2}e^x\sqrt{9+e^{2x}} + \frac{9}{2}\sinh^{-1}\left(\frac{e^x}{3}\right)$$

Mathematica [A]
time = 0.04, size = 39, normalized size = 1.26

$$\frac{1}{2}e^x\sqrt{9+e^{2x}} + \frac{9}{2}\tanh^{-1}\left(\frac{e^x}{\sqrt{9+e^{2x}}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*Sqrt[9 + E^(2*x)],x]
[Out] (E^x*Sqrt[9 + E^(2*x)])/2 + (9*ArcTanh[E^x/Sqrt[9 + E^(2*x)]])/2
```

Maple [A]
time = 0.02, size = 21, normalized size = 0.68

method	result	size
default	$\frac{9\,\text{arcsinh}\left(\frac{e^x}{3}\right)}{2}+\frac{e^x\sqrt{9+e^{2x}}}{2}$	21
risch	$\frac{9\,\text{arcsinh}\left(\frac{e^x}{3}\right)}{2}+\frac{e^x\sqrt{9+e^{2x}}}{2}$	21

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(9+exp(2*x))^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/2*exp(x)*(9+exp(x)^2)^(1/2)+9/2*arcsinh(1/3*exp(x))
```

Maxima [A]
time = 0.51, size = 20, normalized size = 0.65

$$\frac{1}{2}\sqrt{e^{(2\,x)}+9}\,e^x + \frac{9}{2}\,\text{arsinh}\left(\frac{1}{3}\,e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(9+exp(2*x))^(1/2),x, algorithm="maxima")
[Out] 1/2*sqrt(e^(2*x) + 9)*e^x + 9/2*arcsinh(1/3*e^x)
```

Fricas [A]
time = 0.36, size = 29, normalized size = 0.94

$$\frac{1}{2}\sqrt{e^{(2x)}+9}\,e^{x}-\frac{9}{2}\log\left(\sqrt{e^{(2x)}+9}-e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(9+exp(2*x))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/2*sqrt(e^(2*x) + 9)*e^x - 9/2*log(sqrt(e^(2*x) + 9) - e^x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{e^{2x}+9}\,e^{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(9+exp(2*x))**(1/2),x)
```

```
[Out] Integral(sqrt(exp(2*x) + 9)*exp(x), x)
```

Giac [A]
time = 4.83, size = 29, normalized size = 0.94

$$\frac{1}{2}\sqrt{e^{(2x)}+9}\,e^{x}-\frac{9}{2}\log\left(\sqrt{e^{(2x)}+9}-e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(9+exp(2*x))^(1/2),x, algorithm="giac")
```

```
[Out] 1/2*sqrt(e^(2*x) + 9)*e^x - 9/2*log(sqrt(e^(2*x) + 9) - e^x)
```

Mupad [B]
time = 3.59, size = 20, normalized size = 0.65

$$\frac{9\,\mathrm{asinh}\left(\frac{e^{x}}{3}\right)}{2}+\frac{e^{x}\,\sqrt{e^{2\,x}+9}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(exp(2*x) + 9)^(1/2),x)
```

```
[Out] (9*asinh(exp(x)/3))/2 + (exp(x)*(exp(2*x) + 9)^(1/2))/2
```

3.661 $\int e^x \sqrt{1+e^{2x}}\, dx$

Optimal. Leaf size=27

$$\frac{1}{2}e^x\sqrt{1+e^{2x}}+\frac{1}{2}\sinh^{-1}\left(e^x\right)$$

```
[Out] 1/2*arcsinh(exp(x))+1/2*exp(x)*(1+exp(2*x))^(1/2)
```

Rubi [A]
time = 0.02, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2281, 201, 221}

$$\frac{1}{2}e^x\sqrt{e^{2x}+1}+\frac{1}{2}\sinh^{-1}\left(e^x\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^x*Sqrt[1 + E^(2*x)],x]
```

```
[Out] (E^x*Sqrt[1 + E^(2*x)])/2 + ArcSinh[E^x]/2
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 221

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[Rt[b, 2]*(x/Sqrt
[a])]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int e^x\sqrt{1+e^{2x}}\,dx &= \text{Subst}\left(\int \sqrt{1+x^2}\,dx, x, e^x\right)\\ &= \frac{1}{2}e^x\sqrt{1+e^{2x}} + \frac{1}{2}\text{Subst}\left(\int \frac{1}{\sqrt{1+x^2}}\,dx, x, e^x\right)\\ &= \frac{1}{2}e^x\sqrt{1+e^{2x}} + \frac{1}{2}\sinh^{-1}\left(e^x\right)\end{aligned}$$

Mathematica [A]
time = 0.04, size = 36, normalized size = 1.33

$$\frac{1}{2}\left(e^x\sqrt{1+e^{2x}} + \tanh^{-1}\left(\frac{e^x}{\sqrt{1+e^{2x}}}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*Sqrt[1 + E^(2*x)],x]
[Out] (E^x*Sqrt[1 + E^(2*x)] + ArcTanh[E^x/Sqrt[1 + E^(2*x)]])/2
```

Maple [A]
time = 0.02, size = 19, normalized size = 0.70

method	result	size
default	$\frac{\operatorname{arcsinh}(e^x)}{2}+\frac{e^x\sqrt{1+e^{2x}}}{2}$	19
risch	$\frac{\operatorname{arcsinh}(e^x)}{2}+\frac{e^x\sqrt{1+e^{2x}}}{2}$	19

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(1+exp(2*x))^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/2*exp(x)*(1+exp(x)^2)^(1/2)+1/2*arcsinh(exp(x))
```

Maxima [A]
time = 0.51, size = 18, normalized size = 0.67

$$\frac{1}{2}\sqrt{e^{(2\,x)}+1}\,e^x + \frac{1}{2}\,\operatorname{arsinh}\left(e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(1+exp(2*x))^(1/2),x, algorithm="maxima")
[Out] 1/2*sqrt(e^(2*x) + 1)*e^x + 1/2*arcsinh(e^x)
```

Fricas [A]
time = 0.38, size = 29, normalized size = 1.07

$$\frac{1}{2}\sqrt{e^{(2x)}+1}\,e^{x}-\frac{1}{2}\log\left(\sqrt{e^{(2x)}+1}-e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(1+exp(2*x))^(1/2),x, algorithm="fricas")
[Out] 1/2*sqrt(e^(2*x) + 1)*e^x - 1/2*log(sqrt(e^(2*x) + 1) - e^x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{e^{2x}+1}\,e^{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(1+exp(2*x))**(1/2),x)
[Out] Integral(sqrt(exp(2*x) + 1)*exp(x), x)
```

Giac [A]
time = 2.84, size = 29, normalized size = 1.07

$$\frac{1}{2}\sqrt{e^{(2x)}+1}\,e^{x}-\frac{1}{2}\log\left(\sqrt{e^{(2x)}+1}-e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(1+exp(2*x))^(1/2),x, algorithm="giac")
[Out] 1/2*sqrt(e^(2*x) + 1)*e^x - 1/2*log(sqrt(e^(2*x) + 1) - e^x)
```

Mupad [B]
time = 3.55, size = 18, normalized size = 0.67

$$\frac{\mathrm{asinh}(\mathrm{e}^{x})}{2}+\frac{\mathrm{e}^{x}\,\sqrt{\mathrm{e}^{2\,x}+1}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(exp(2*x) + 1)^(1/2),x)
[Out] asinh(exp(x))/2 + (exp(x)*(exp(2*x) + 1)^(1/2))/2
```

3.662 $\int \frac{e^{x^2} x}{1+e^{2x^2}} dx$

Optimal. Leaf size=10

$$\frac{1}{2}\tan^{-1}\left(e^{x^2}\right)$$

[Out] 1/2*arctan(exp(x^2))

Rubi [A]

time = 0.09, antiderivative size = 10, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {6847, 2281, 209}

$$\frac{1}{2}\text{ArcTan}\left(e^{x^2}\right)$$

Antiderivative was successfully verified.

[In] Int[(E^x^2*x)/(1 + E^(2*x^2)),x]

[Out] ArcTan[E^x^2]/2

Rule 209

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[b, 2]))*A
rcTan[Rt[b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 6847

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
fQ[x^(m + 1), u, x]
```

Rubi steps

$$\int \frac{e^{x^2}x}{1+e^{2x^2}}\,dx = \frac{1}{2}\text{Subst}\left(\int \frac{e^x}{1+e^{2x}}\,dx, x, x^2\right)$$
$$= \frac{1}{2}\text{Subst}\left(\int \frac{1}{1+x^2}\,dx, x, e^{x^2}\right)$$
$$= \frac{1}{2}\tan^{-1}\left(e^{x^2}\right)$$

<u>**Mathematica**</u> [**A**]
time = 0.02, size = 10, normalized size = 1.00

$$\frac{1}{2}\tan^{-1}\left(e^{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^x^2*x)/(1 + E^(2*x^2)),x]
```

```
[Out] ArcTan[E^x^2]/2
```

<u>**Maple**</u> [**A**]
time = 0.02, size = 8, normalized size = 0.80

method	result	size
derivativedivides	$\frac{\arctan\left(e^{x^2}\right)}{2}$	8
default	$\frac{\arctan\left(e^{x^2}\right)}{2}$	8
risch	$\frac{i\ln\left(e^{x^2}+i\right)}{4}-\frac{i\ln\left(e^{x^2}-i\right)}{4}$	24

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^2)*x/(1+exp(2*x^2)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*arctan(exp(x^2))
```

<u>**Maxima**</u> [**A**]
time = 0.57, size = 7, normalized size = 0.70

$$\frac{1}{2}\arctan\left(e^{\left(x^2\right)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*x/(1+exp(2*x^2)),x, algorithm="maxima")
```

```
[Out] 1/2*arctan(e^(x^2))
```

Fricas [A]
time = 0.36, size = 7, normalized size = 0.70

$$\frac{1}{2} \arctan\left(e^{(x^2)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*x/(1+exp(2*x^2)),x, algorithm="fricas")
```

```
[Out] 1/2*arctan(e^(x^2))
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 17 vs. $2(7) = 14$.
time = 0.04, size = 17, normalized size = 1.70

$$\operatorname{RootSum}\left(16z^2 + 1, \left(i \mapsto i \log\left(4i + e^{x^2}\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**2)*x/(1+exp(2*x**2)),x)
```

```
[Out] RootSum(16*_z**2 + 1, Lambda(_i, _i*log(4*_i + exp(x**2))))
```

Giac [A]
time = 2.62, size = 7, normalized size = 0.70

$$\frac{1}{2} \arctan\left(e^{(x^2)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*x/(1+exp(2*x^2)),x, algorithm="giac")
```

```
[Out] 1/2*arctan(e^(x^2))
```

Mupad [B]
time = 0.07, size = 7, normalized size = 0.70

$$\frac{\operatorname{atan}\left(e^{x^2}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*exp(x^2))/(exp(2*x^2) + 1),x)
```

```
[Out] atan(exp(x^2))/2
```

3.663 $\int e^{x^{3/2}} x^2 \, dx$

Optimal. Leaf size=28

$$-\frac{2}{3}e^{x^{3/2}}+\frac{2}{3}e^{x^{3/2}}x^{3/2}$$

```
[Out] -2/3*exp(x^(3/2))+2/3*exp(x^(3/2))*x^(3/2)
```

Rubi [A]
time = 0.03, antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {2247, 2243, 2240}

$$\frac{2}{3}e^{x^{3/2}}x^{3/2}-\frac{2e^{x^{3/2}}}{3}$$

Antiderivative was successfully verified.

```
[In] Int[E^x^(3/2)*x^2,x]
```

```
[Out] (-2*E^x^(3/2))/3 + (2*E^x^(3/2)*x^(3/2))/3
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rule 2247

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> With[{k = Denominator[n]}, Dist[k/d, Subst[Int[x^(k*(m + 1
) - 1)*F^(a + b*x^(k*n)), x], x, (c + d*x)^(1/k)], x]] /; FreeQ[{F, a, b, c
, d, m, n}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[0, (m + 1)/n, 5] &&  !Inte
gerQ[n]
```

Rubi steps

$$\begin{aligned}\int e^{x^{3/2}}x^2\,dx &= 2\text{Subst}\left(\int e^{x^3}x^5\,dx, x, \sqrt{x}\right)\\ &= \frac{2}{3}e^{x^{3/2}}x^{3/2} - 2\text{Subst}\left(\int e^{x^3}x^2\,dx, x, \sqrt{x}\right)\\ &= -\frac{2}{3}e^{x^{3/2}} + \frac{2}{3}e^{x^{3/2}}x^{3/2}\end{aligned}$$

Mathematica [C] Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.
time = 0.00, size = 13, normalized size = 0.46

$$-\frac{2}{3}\Gamma\left(2, -x^{3/2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x^(3/2)*x^2,x]
```

```
[Out] (-2*Gamma[2, -x^(3/2)])/3
```

Maple [A]
time = 0.01, size = 17, normalized size = 0.61

method	result	size
meijerg	$\frac{2}{3}-\frac{\left(2-2x^{\frac{3}{2}}\right)e^{x^{\frac{3}{2}}}}{3}$	16
derivativedivides	$-\frac{2\,e^{x^{\frac{3}{2}}}}{3}+\frac{2\,e^{x^{\frac{3}{2}}}x^{\frac{3}{2}}}{3}$	17
default	$-\frac{2\,e^{x^{\frac{3}{2}}}}{3}+\frac{2\,e^{x^{\frac{3}{2}}}x^{\frac{3}{2}}}{3}$	17

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^(3/2))*x^2,x,method=_RETURNVERBOSE)
```

```
[Out] -2/3*exp(x^(3/2))+2/3*exp(x^(3/2))*x^(3/2)
```

Maxima [A]
time = 0.28, size = 11, normalized size = 0.39

$$\frac{2}{3}\left(x^{\frac{3}{2}}-1\right)e^{\left(x^{\frac{3}{2}}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^(3/2))*x^2,x, algorithm="maxima")
```

```
[Out] 2/3*(x^(3/2) - 1)*e^(x^(3/2))
```

Fricas [A]
time = 0.37, size = 11, normalized size = 0.39

$$\frac{2}{3}\left(x^{\frac{3}{2}}-1\right)e^{\left(x^{\frac{3}{2}}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^(3/2))*x^2,x, algorithm="fricas")
[Out] 2/3*(x^(3/2) - 1)*e^(x^(3/2))
```

Sympy [A]
time = 0.48, size = 24, normalized size = 0.86

$$\frac{2x^{\frac{3}{2}}e^{x^{\frac{3}{2}}}}{3}-\frac{2e^{x^{\frac{3}{2}}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**(3/2))*x**2,x)
[Out] 2*x**(3/2)*exp(x**(3/2))/3 - 2*exp(x**(3/2))/3
```

Giac [A]
time = 3.72, size = 11, normalized size = 0.39

$$\frac{2}{3}\left(x^{\frac{3}{2}}-1\right)e^{\left(x^{\frac{3}{2}}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^(3/2))*x^2,x, algorithm="giac")
[Out] 2/3*(x^(3/2) - 1)*e^(x^(3/2))
```

Mupad [B]
time = 3.57, size = 16, normalized size = 0.57

$$\frac{2\,x^{3/2}\,\mathrm{e}^{x^{3/2}}}{3}-\frac{2\,\mathrm{e}^{x^{3/2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*exp(x^(3/2)),x)
[Out] (2*x^(3/2)*exp(x^(3/2)))/3 - (2*exp(x^(3/2)))/3
```

3.664 $\int \frac{e^x}{\sqrt{-3+e^{2x}}} \, dx$

Optimal. Leaf size=16

$$\tanh^{-1}\left(\frac{e^x}{\sqrt{-3+e^{2x}}}\right)$$

```
[Out] arctanh(exp(x)/(-3+exp(2*x))^(1/2))
```

Rubi [A]
time = 0.02, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2281, 223, 212}

$$\tanh^{-1}\left(\frac{e^x}{\sqrt{e^{2x}-3}}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^x/Sqrt[-3 + E^(2*x)],x]
```

```
[Out] ArcTanh[E^x/Sqrt[-3 + E^(2*x)]]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 223

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^x}{\sqrt{-3+e^{2x}}}\,dx = \text{Subst}\left(\int \frac{1}{\sqrt{-3+x^2}}\,dx, x, e^x\right)$$
$$= \text{Subst}\left(\int \frac{1}{1-x^2}\,dx, x, \frac{e^x}{\sqrt{-3+e^{2x}}}\right)$$
$$= \tanh^{-1}\left(\frac{e^x}{\sqrt{-3+e^{2x}}}\right)$$

Mathematica [A]
time = 0.03, size = 16, normalized size = 1.00

$$\tanh^{-1}\left(\frac{e^x}{\sqrt{-3+e^{2x}}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/Sqrt[-3 + E^(2*x)],x]
[Out] ArcTanh[E^x/Sqrt[-3 + E^(2*x)]]
```

Maple [A]
time = 0.02, size = 13, normalized size = 0.81

method	result	size
default	$\ln\left(e^{x}+\sqrt{-3+e^{2x}}\right)$	13

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(-3+exp(2*x))^(1/2),x,method=_RETURNVERBOSE)
[Out] ln(exp(x)+(-3+exp(x)^2)^(1/2))
```

Maxima [A]
time = 0.28, size = 16, normalized size = 1.00

$$\log\left(2\sqrt{e^{(2x)}-3}+2e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-3+exp(2*x))^(1/2),x, algorithm="maxima")
[Out] log(2*sqrt(e^(2*x) - 3) + 2*e^x)
```

Fricas [A]
time = 0.35, size = 16, normalized size = 1.00

$$-\log\left(\sqrt{e^{(2x)}-3}-e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-3+exp(2*x))^(1/2),x, algorithm="fricas")
```

```
[Out] -log(sqrt(e^(2*x) - 3) - e^x)
```

Sympy [A]
time = 0.31, size = 10, normalized size = 0.62

$$\operatorname{acosh}\left(\frac{\sqrt{3}\,e^{x}}{3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-3+exp(2*x))**(1/2),x)
```

```
[Out] acosh(sqrt(3)*exp(x)/3)
```

Giac [A]
time = 4.82, size = 16, normalized size = 1.00

$$-\log\left(-\sqrt{e^{(2\,x)}-3}+e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-3+exp(2*x))^(1/2),x, algorithm="giac")
```

```
[Out] -log(-sqrt(e^(2*x) - 3) + e^x)
```

Mupad [B]
time = 3.77, size = 12, normalized size = 0.75

$$\ln\left(\mathrm{e}^{x}+\sqrt{\mathrm{e}^{2\,x}-3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(2*x) - 3)^(1/2),x)
```

```
[Out] log(exp(x) + (exp(2*x) - 3)^(1/2))
```

3.665 $\int \frac{e^x}{16-e^{2x}}\,dx$

Optimal. Leaf size=12

$$\frac{1}{4}\tanh^{-1}\left(\frac{e^x}{4}\right)$$

```
[Out] 1/4*arctanh(1/4*exp(x))
```

Rubi [A]

time = 0.01, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {2281, 212}

$$\frac{1}{4}\tanh^{-1}\left(\frac{e^x}{4}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^x/(16 - E^(2*x)),x]
```

```
[Out] ArcTanh[E^x/4]/4
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^x}{16-e^{2x}}\,dx &= \text{Subst}\left(\int \frac{1}{16-x^2}\,dx, x, e^x\right)\\ &= \frac{1}{4}\tanh^{-1}\left(\frac{e^x}{4}\right)\end{aligned}$$

Mathematica [A]
time = 0.02, size = 12, normalized size = 1.00

$$\frac{1}{4}\tanh^{-1}\left(\frac{e^x}{4}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(16 - E^(2*x)),x]
```

```
[Out] ArcTanh[E^x/4]/4
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 15 vs. 2(7) = 14.
time = 0.02, size = 16, normalized size = 1.33

method	result	size
default	$\frac{\ln(e^x+4)}{8}-\frac{\ln(e^x-4)}{8}$	16
norman	$\frac{\ln(e^x+4)}{8}-\frac{\ln(e^x-4)}{8}$	16
risch	$\frac{\ln(e^x+4)}{8}-\frac{\ln(e^x-4)}{8}$	16

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(16-exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/8*ln(exp(x)+4)-1/8*ln(exp(x)-4)
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 15 vs. 2(7) = 14.
time = 0.28, size = 15, normalized size = 1.25

$$\frac{1}{8}\log\left(e^x+4\right)-\frac{1}{8}\log\left(e^x-4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(16-exp(2*x)),x, algorithm="maxima")
```

```
[Out] 1/8*log(e^x + 4) - 1/8*log(e^x - 4)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 15 vs. 2(7) = 14.
time = 0.37, size = 15, normalized size = 1.25

$$\frac{1}{8}\log\left(e^x+4\right)-\frac{1}{8}\log\left(e^x-4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(16-exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/8*log(e^x + 4) - 1/8*log(e^x - 4)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 15 vs. $2(7) = 14$.
time = 0.03, size = 15, normalized size = 1.25

$$-\frac{\log(e^x - 4)}{8} + \frac{\log(e^x + 4)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(16-exp(2*x)),x)
```

```
[Out] -log(exp(x) - 4)/8 + log(exp(x) + 4)/8
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 16 vs. $2(7) = 14$.
time = 2.64, size = 16, normalized size = 1.33

$$\frac{1}{8}\log(e^x + 4) - \frac{1}{8}\log(|e^x - 4|)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(16-exp(2*x)),x, algorithm="giac")
```

```
[Out] 1/8*log(e^x + 4) - 1/8*log(abs(e^x - 4))
```

Mupad [B]
time = 3.65, size = 15, normalized size = 1.25

$$\frac{\ln(\mathrm{e}^x + 4)}{8} - \frac{\ln(\mathrm{e}^x - 4)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-exp(x)/(exp(2*x) - 16),x)
```

```
[Out] log(exp(x) + 4)/8 - log(exp(x) - 4)/8
```

3.666 $\int \frac{e^{5x}}{1+e^{10x}}\,dx$

Optimal. Leaf size=10

$$\frac{1}{5}\tan^{-1}\left(e^{5x}\right)$$

```
[Out] 1/5*arctan(exp(5*x))
```

Rubi [A]
time = 0.01, antiderivative size = 10, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {2281, 209}

$$\frac{1}{5}\text{ArcTan}\left(e^{5x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^(5*x)/(1 + E^(10*x)),x]
```

```
[Out] ArcTan[E^(5*x)]/5
```

Rule 209

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[b, 2]))*A
rcTan[Rt[b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{5x}}{1+e^{10x}}\,dx &= \frac{1}{5}\text{Subst}\left(\int \frac{1}{1+x^2}\,dx, x, e^{5x}\right)\\ &= \frac{1}{5}\tan^{-1}\left(e^{5x}\right)\end{aligned}$$

Mathematica [A]
time = 0.16, size = 10, normalized size = 1.00

$$\frac{1}{5}\tan^{-1}\left(e^{5x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(5*x)/(1 + E^(10*x)),x]
[Out] ArcTan[E^(5*x)]/5
```

Maple [A]
time = 0.02, size = 8, normalized size = 0.80

method	result	size
default	$\frac{\arctan\left(e^{5x}\right)}{5}$	8
risch	$\frac{i\ln\left(e^{5x}+i\right)}{10}-\frac{i\ln\left(e^{5x}-i\right)}{10}$	24

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(5*x)/(1+exp(10*x)),x,method=_RETURNVERBOSE)
[Out] 1/5*arctan(exp(x)^5)
```

Maxima [A]
time = 0.52, size = 7, normalized size = 0.70

$$\frac{1}{5}\arctan\left(e^{(5x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(5*x)/(1+exp(10*x)),x, algorithm="maxima")
[Out] 1/5*arctan(e^(5*x))
```

Fricas [A]
time = 0.35, size = 7, normalized size = 0.70

$$\frac{1}{5}\arctan\left(e^{(5x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(5*x)/(1+exp(10*x)),x, algorithm="fricas")
[Out] 1/5*arctan(e^(5*x))
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 17 vs. $2(7) = 14$.
time = 0.04, size = 17, normalized size = 1.70

$$\text{RootSum}\left(100z^2 + 1, \left(i \mapsto i\log\left(10i + e^{5x}\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(5*x)/(1+exp(10*x)),x)
```

```
[Out] RootSum(100*_z**2 + 1, Lambda(_i, _i*log(10*_i + exp(5*x))))
```

Giac [A]
time = 6.46, size = 7, normalized size = 0.70

$$\frac{1}{5}\arctan\left(e^{(5x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(5*x)/(1+exp(10*x)),x, algorithm="giac")
```

```
[Out] 1/5*arctan(e^(5*x))
```

Mupad [B]
time = 0.06, size = 7, normalized size = 0.70

$$\frac{\text{atan}(\mathrm{e}^{5x})}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(5*x)/(exp(10*x) + 1),x)
```

```
[Out] atan(exp(5*x))/5
```

3.667 $\int \frac{e^{4x}}{\sqrt{16+e^{8x}}}\,dx$

Optimal. Leaf size=14

$$\frac{1}{4}\sinh^{-1}\left(\frac{e^{4x}}{4}\right)$$

```
[Out] 1/4*arcsinh(1/4*exp(4*x))
```

Rubi [A]
time = 0.01, antiderivative size = 14, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$, Rules used = {2281, 221}

$$\frac{1}{4}\sinh^{-1}\left(\frac{e^{4x}}{4}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^(4*x)/Sqrt[16 + E^(8*x)],x]
```

```
[Out] ArcSinh[E^(4*x)/4]/4
```

Rule 221

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[Rt[b, 2]*(x/Sqrt
[a])]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{4x}}{\sqrt{16+e^{8x}}}\,dx &= \frac{1}{4}\text{Subst}\left(\int \frac{1}{\sqrt{16+x^2}}\,dx, x, e^{4x}\right)\\ &= \frac{1}{4}\sinh^{-1}\left(\frac{e^{4x}}{4}\right)\end{aligned}$$

Mathematica [A]
time = 0.03, size = 22, normalized size = 1.57

$$\frac{1}{4}\tanh^{-1}\left(\frac{e^{4x}}{\sqrt{16+e^{8x}}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(4*x)/Sqrt[16 + E^(8*x)],x]
```

```
[Out] ArcTanh[E^(4*x)/Sqrt[16 + E^(8*x)]]/4
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{e}^{4x}}{\sqrt{16+\mathrm{e}^{8x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x)/(16+exp(8*x))^(1/2),x)
```

```
[Out] int(exp(4*x)/(16+exp(8*x))^(1/2),x)
```

Maxima [A]
time = 0.72, size = 9, normalized size = 0.64

$$\frac{1}{4}\,\mathrm{arsinh}\left(\frac{1}{4}\,e^{(4\,x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(16+exp(8*x))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/4*arcsinh(1/4*e^(4*x))
```

Fricas [A]
time = 0.36, size = 18, normalized size = 1.29

$$-\frac{1}{4}\,\log\left(\sqrt{e^{(8\,x)}+16}-e^{(4\,x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(16+exp(8*x))^(1/2),x, algorithm="fricas")
```

```
[Out] -1/4*log(sqrt(e^(8*x) + 16) - e^(4*x))
```

Sympy [A]
time = 0.43, size = 8, normalized size = 0.57

$$\frac{\operatorname{asinh}\left(\frac{e^{4x}}{4}\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(16+exp(8*x))**(1/2),x)
```

```
[Out] asinh(exp(4*x)/4)/4
```

Giac [A]
time = 5.10, size = 18, normalized size = 1.29

$$-\frac{1}{4}\,\log\left(\sqrt{e^{(8\,x)}+16}-e^{(4\,x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(16+exp(8*x))^(1/2),x, algorithm="giac")
```

```
[Out] -1/4*log(sqrt(e^(8*x) + 16) - e^(4*x))
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.07

$$\int\frac{\mathrm{e}^{4\,x}}{\sqrt{\mathrm{e}^{8\,x}+16}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x)/(exp(8*x) + 16)^(1/2),x)
```

```
[Out] int(exp(4*x)/(exp(8*x) + 16)^(1/2), x)
```

3.668 $\int e^{4x^3} x^2 \cos(7x^3)\, dx$

Optimal. Leaf size=35

$$\frac{4}{195}e^{4x^3}\cos(7x^3)+\frac{7}{195}e^{4x^3}\sin(7x^3)$$

```
[Out] 4/195*exp(4*x^3)*cos(7*x^3)+7/195*exp(4*x^3)*sin(7*x^3)
```

Rubi [A]
time = 0.13, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$, Rules used = {6847, 4518}

$$\frac{7}{195}e^{4x^3}\sin(7x^3)+\frac{4}{195}e^{4x^3}\cos(7x^3)$$

Antiderivative was successfully verified.

```
[In] Int[E^(4*x^3)*x^2*Cos[7*x^3],x]
```

```
[Out] (4*E^(4*x^3)*Cos[7*x^3])/195 + (7*E^(4*x^3)*Sin[7*x^3])/195
```

Rule 4518

```
Int[Cos[(d_.) + (e_.)*(x_)]*(F_)^((c_.)*((a_.) + (b_.)*(x_))), x_Symbol] :>
 Simp[b*c*Log[F]*F^(c*(a + b*x))*(Cos[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x
] + Simp[e*F^(c*(a + b*x))*(Sin[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x] /; F
reeQ[{F, a, b, c, d, e}, x] && NeQ[e^2 + b^2*c^2*Log[F]^2, 0]
```

Rule 6847

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
fQ[x^(m + 1), u, x]
```

Rubi steps

$$\begin{aligned}\int e^{4x^3}x^2\cos(7x^3)\, dx &= \frac{1}{3}\text{Subst}\left(\int e^{4x}\cos(7x)\, dx, x, x^3\right)\\ &= \frac{4}{195}e^{4x^3}\cos(7x^3)+\frac{7}{195}e^{4x^3}\sin(7x^3)\end{aligned}$$

Mathematica [A]
time = 0.04, size = 28, normalized size = 0.80

$$\frac{1}{195}e^{4x^3}\left(4\cos(7x^3)+7\sin(7x^3)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(4*x^3)*x^2*Cos[7*x^3],x]
[Out] (E^(4*x^3)*(4*Cos[7*x^3] + 7*Sin[7*x^3]))/195
```

Maple [C] Result contains complex when optimal does not.
time = 0.05, size = 44, normalized size = 1.26

method	result	size
risch	$\frac{2\,\mathrm{e}^{(4+7i)x^3}}{195}-\frac{7i\mathrm{e}^{(4+7i)x^3}}{390}+\frac{2\,\mathrm{e}^{(4-7i)x^3}}{195}+\frac{7i\mathrm{e}^{(4-7i)x^3}}{390}$	44
norman	$\frac{\frac{14\,\mathrm{e}^{4x^3}\tan\left(\frac{7x^3}{2}\right)}{195}-\frac{4\,\mathrm{e}^{4x^3}\left(\tan^2\left(\frac{7x^3}{2}\right)\right)}{195}+\frac{4\,\mathrm{e}^{4x^3}}{195}}{1+\tan^2\left(\frac{7x^3}{2}\right)}$	53

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x^3)*x^2*cos(7*x^3),x,method=_RETURNVERBOSE)
[Out] 2/195*exp((4+7*I)*x^3)-7/390*I*exp((4+7*I)*x^3)+2/195*exp((4-7*I)*x^3)+7/39
0*I*exp((4-7*I)*x^3)
```

Maxima [A]
time = 0.34, size = 29, normalized size = 0.83

$$\frac{4}{195}\cos\left(7\,x^3\right)e^{\left(4\,x^3\right)}+\frac{7}{195}\,e^{\left(4\,x^3\right)}\sin\left(7\,x^3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x^3)*x^2*cos(7*x^3),x, algorithm="maxima")
[Out] 4/195*cos(7*x^3)*e^(4*x^3) + 7/195*e^(4*x^3)*sin(7*x^3)
```

Fricas [A]
time = 0.39, size = 29, normalized size = 0.83

$$\frac{4}{195}\cos\left(7\,x^3\right)e^{\left(4\,x^3\right)}+\frac{7}{195}\,e^{\left(4\,x^3\right)}\sin\left(7\,x^3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x^3)*x^2*cos(7*x^3),x, algorithm="fricas")
[Out] 4/195*cos(7*x^3)*e^(4*x^3) + 7/195*e^(4*x^3)*sin(7*x^3)
```

Sympy [A]
time = 0.34, size = 32, normalized size = 0.91

$$\frac{7e^{4x^3}\sin\left(7x^3\right)}{195}+\frac{4e^{4x^3}\cos\left(7x^3\right)}{195}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x**3)*x**2*cos(7*x**3),x)
```

```
[Out] 7*exp(4*x**3)*sin(7*x**3)/195 + 4*exp(4*x**3)*cos(7*x**3)/195
```

Giac [A]
time = 4.63, size = 25, normalized size = 0.71

$$\frac{1}{195} \left(4 \cos\left(7 x^{3}\right) + 7 \sin\left(7 x^{3}\right)\right) e^{\left(4 x^{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x^3)*x^2*cos(7*x^3),x, algorithm="giac")
```

```
[Out] 1/195*(4*cos(7*x^3) + 7*sin(7*x^3))*e^(4*x^3)
```

Mupad [B]
time = 3.59, size = 25, normalized size = 0.71

$$\frac{e^{4 x^{3}} \left(4 \cos\left(7 x^{3}\right) + 7 \sin\left(7 x^{3}\right)\right)}{195}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*exp(4*x^3)*cos(7*x^3),x)
```

```
[Out] (exp(4*x^3)*(4*cos(7*x^3) + 7*sin(7*x^3)))/195
```

3.669 $\int e^{1+x^2} x \, dx$

Optimal. Leaf size=11

$$\frac{e^{1+x^2}}{2}$$

[Out] 1/2*exp(x^2+1)

Rubi [A]
time = 0.01, antiderivative size = 11, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2240}

$$\frac{e^{x^2+1}}{2}$$

Antiderivative was successfully verified.

[In] Int[E^(1 + x^2)*x,x]

[Out] E^(1 + x^2)/2

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int e^{1+x^2} x \, dx = \frac{e^{1+x^2}}{2}$$

Mathematica [A]
time = 0.01, size = 11, normalized size = 1.00

$$\frac{e^{1+x^2}}{2}$$

Antiderivative was successfully verified.

[In] Integrate[E^(1 + x^2)*x,x]

[Out] E^(1 + x^2)/2

Maple [A]
time = 0.01, size = 9, normalized size = 0.82

method	result	size
gosper	$\frac{e^{x^2+1}}{2}$	9
derivativedivides	$\frac{e^{x^2+1}}{2}$	9
default	$\frac{e^{x^2+1}}{2}$	9
norman	$\frac{e^{x^2+1}}{2}$	9
risch	$\frac{e^{x^2+1}}{2}$	9
meijerg	$-\frac{e\left(1-e^{x^2}\right)}{2}$	13

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^2+1)*x,x,method=_RETURNVERBOSE)
[Out] 1/2*exp(x^2+1)
```

Maxima [A]
time = 0.35, size = 8, normalized size = 0.73

$$\frac{1}{2}\,e^{\left(x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2+1)*x,x, algorithm="maxima")
[Out] 1/2*e^(x^2 + 1)
```

Fricas [A]
time = 0.36, size = 8, normalized size = 0.73

$$\frac{1}{2}\,e^{\left(x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2+1)*x,x, algorithm="fricas")
[Out] 1/2*e^(x^2 + 1)
```

Sympy [A]
time = 0.02, size = 7, normalized size = 0.64

$$\frac{e^{x^2+1}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**2+1)*x,x)
```

```
[Out] exp(x**2 + 1)/2
```

Giac [A]
time = 3.66, size = 8, normalized size = 0.73

$$\frac{1}{2}\,e^{\left(x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2+1)*x,x, algorithm="giac")
```

```
[Out] 1/2*e^(x^2 + 1)
```

Mupad [B]
time = 0.05, size = 8, normalized size = 0.73

$$\frac{\mathrm{e}^{x^2}\,\mathrm{e}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*exp(x^2 + 1),x)
```

```
[Out] (exp(x^2)*exp(1))/2
```

3.670 $\int e^{1+x^3} x^2 \, dx$

Optimal. Leaf size=11

$$\frac{e^{1+x^3}}{3}$$

```
[Out] 1/3*exp(x^3+1)
```

Rubi [A]
time = 0.01, antiderivative size = 11, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = $\{2240\}$

$$\frac{e^{x^3+1}}{3}$$

Antiderivative was successfully verified.

```
[In] Int[E^(1 + x^3)*x^2,x]
```

```
[Out] E^(1 + x^3)/3
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int e^{1+x^3} x^2 \, dx = \frac{e^{1+x^3}}{3}$$

Mathematica [A]
time = 0.01, size = 11, normalized size = 1.00

$$\frac{e^{1+x^3}}{3}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(1 + x^3)*x^2,x]
```

```
[Out] E^(1 + x^3)/3
```

Maple [A]
time = 0.01, size = 9, normalized size = 0.82

method	result	size
gosper	$\frac{e^{x^3+1}}{3}$	9
derivativedivides	$\frac{e^{x^3+1}}{3}$	9
default	$\frac{e^{x^3+1}}{3}$	9
norman	$\frac{e^{x^3+1}}{3}$	9
meijerg	$-\frac{e\left(1-e^{x^3}\right)}{3}$	13
risch	$\frac{e^{(x+1)\left(x^2-x+1\right)}}{3}$	16

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^3+1)*x^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*exp(x^3+1)
```

Maxima [A]
time = 0.37, size = 8, normalized size = 0.73

$$\frac{1}{3}e^{(x^3+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^3+1)*x^2,x, algorithm="maxima")
```

```
[Out] 1/3*e^(x^3 + 1)
```

Fricas [A]
time = 0.40, size = 8, normalized size = 0.73

$$\frac{1}{3}e^{(x^3+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^3+1)*x^2,x, algorithm="fricas")
```

```
[Out] 1/3*e^(x^3 + 1)
```

Sympy [A]
time = 0.02, size = 7, normalized size = 0.64

$$\frac{e^{x^3+1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**3+1)*x**2,x)
```

```
[Out] exp(x**3 + 1)/3
```

Giac [A]
time = 2.29, size = 8, normalized size = 0.73

$$\frac{1}{3} e^{\left(x^3+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^3+1)*x^2,x, algorithm="giac")
```

```
[Out] 1/3*e^(x^3 + 1)
```

Mupad [B]
time = 3.51, size = 8, normalized size = 0.73

$$\frac{\mathrm{e}^{x^3}\,\mathrm{e}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*exp(x^3 + 1),x)
```

```
[Out] (exp(x^3)*exp(1))/3
```

3.671 $\int \frac{e^{\sqrt{x}}}{\sqrt{x}}\,dx$

Optimal. Leaf size=9

$$2e^{\sqrt{x}}$$

```
[Out] 2*exp(x^(1/2))
```

Rubi [A]
time = 0.01, antiderivative size = 9, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2240}

$$2e^{\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In] Int[E^Sqrt[x]/Sqrt[x],x]
```

```
[Out] 2*E^Sqrt[x]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{e^{\sqrt{x}}}{\sqrt{x}}\,dx = 2e^{\sqrt{x}}$$

Mathematica [A]
time = 0.00, size = 9, normalized size = 1.00

$$2e^{\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^Sqrt[x]/Sqrt[x],x]
```

```
[Out] 2*E^Sqrt[x]
```

Maple [A]
time = 0.01, size = 7, normalized size = 0.78

method	result	size
derivativedivides	$2\,e^{\sqrt{x}}$	7
default	$2\,e^{\sqrt{x}}$	7
meijerg	$-2+2\,e^{\sqrt{x}}$	9

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^(1/2))/x^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2*exp(x^(1/2))
```

Maxima [A]
time = 0.31, size = 6, normalized size = 0.67

$$2\,e^{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^(1/2))/x^(1/2),x, algorithm="maxima")
```

```
[Out] 2*e^sqrt(x)
```

Fricas [A]
time = 0.36, size = 6, normalized size = 0.67

$$2\,e^{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^(1/2))/x^(1/2),x, algorithm="fricas")
```

```
[Out] 2*e^sqrt(x)
```

Sympy [A]
time = 0.06, size = 7, normalized size = 0.78

$$2e^{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**(1/2))/x**(1/2),x)
```

```
[Out] 2*exp(sqrt(x))
```

Giac [A]
time = 4.76, size = 6, normalized size = 0.67

$$2\,e^{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^(1/2))/x^(1/2),x, algorithm="giac")
```

```
[Out] 2*e^sqrt(x)
```

Mupad [B]
time = 3.49, size = 6, normalized size = 0.67

$$2\,\mathrm{e}^{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^(1/2))/x^(1/2),x)
```

```
[Out] 2*exp(x^(1/2))
```

3.672 $\int \frac{e^{\sqrt[3]{x}}}{x^{2/3}}\,dx$

Optimal. Leaf size=9

$$3e^{\sqrt[3]{x}}$$

```
[Out] 3*exp(x^(1/3))
```

Rubi [A]
time = 0.01, antiderivative size = 9, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2240}

$$3e^{\sqrt[3]{x}}$$

Antiderivative was successfully verified.

```
[In] Int[E^x^(1/3)/x^(2/3),x]
```

```
[Out] 3*E^x^(1/3)
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{e^{\sqrt[3]{x}}}{x^{2/3}}\,dx = 3e^{\sqrt[3]{x}}$$

Mathematica [A]
time = 0.00, size = 9, normalized size = 1.00

$$3e^{\sqrt[3]{x}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x^(1/3)/x^(2/3),x]
```

```
[Out] 3*E^x^(1/3)
```

Maple [A]
time = 0.01, size = 7, normalized size = 0.78

method	result	size
derivativedivides	$3\,\mathrm{e}^{x^{\frac{1}{3}}}$	7
default	$3\,\mathrm{e}^{x^{\frac{1}{3}}}$	7
meijerg	$-3+3\,\mathrm{e}^{x^{\frac{1}{3}}}$	9

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^(1/3))/x^(2/3),x,method=_RETURNVERBOSE)
```

```
[Out] 3*exp(x^(1/3))
```

Maxima [A]
time = 0.27, size = 6, normalized size = 0.67

$$3\,e^{\left(x^{\frac{1}{3}}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^(1/3))/x^(2/3),x, algorithm="maxima")
```

```
[Out] 3*e^(x^(1/3))
```

Fricas [A]
time = 0.37, size = 6, normalized size = 0.67

$$3\,e^{\left(x^{\frac{1}{3}}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^(1/3))/x^(2/3),x, algorithm="fricas")
```

```
[Out] 3*e^(x^(1/3))
```

Sympy [A]
time = 0.11, size = 7, normalized size = 0.78

$$3e^{\sqrt[3]{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**(1/3))/x**(2/3),x)
```

```
[Out] 3*exp(x**(1/3))
```

Giac [A]
time = 6.52, size = 6, normalized size = 0.67

$$3\,e^{\left(x^{\frac{1}{3}}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^(1/3))/x^(2/3),x, algorithm="giac")
```

```
[Out] 3*e^(x^(1/3))
```

Mupad [B]
time = 3.57, size = 6, normalized size = 0.67

$$3\,{\mathrm{e}}^{x^{1/3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^(1/3))/x^(2/3),x)
```

```
[Out] 3*exp(x^(1/3))
```

3.673 $\int e^{3x}(-8+2x^3+x^5)\,dx$

Optimal. Leaf size=68

$$-\frac{724e^{3x}}{243}+\frac{76}{81}e^{3x}x-\frac{38}{27}e^{3x}x^2+\frac{38}{27}e^{3x}x^3-\frac{5}{9}e^{3x}x^4+\frac{1}{3}e^{3x}x^5$$

```
[Out] -724/243*exp(3*x)+76/81*exp(3*x)*x-38/27*exp(3*x)*x^2+38/27*exp(3*x)*x^3-5/
9*exp(3*x)*x^4+1/3*exp(3*x)*x^5
```

Rubi [A]
time = 0.07, antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 3, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}=0.188$, Rules used = {2227, 2225, 2207}

$$\frac{1}{3}e^{3x}x^5-\frac{5}{9}e^{3x}x^4+\frac{38}{27}e^{3x}x^3-\frac{38}{27}e^{3x}x^2+\frac{76}{81}e^{3x}x-\frac{724e^{3x}}{243}$$

Antiderivative was successfully verified.

```
[In] Int[E^(3*x)*(-8 + 2*x^3 + x^5),x]
```

```
[Out] (-724*E^(3*x))/243 + (76*E^(3*x)*x)/81 - (38*E^(3*x)*x^2)/27 + (38*E^(3*x)*
x^3)/27 - (5*E^(3*x)*x^4)/9 + (E^(3*x)*x^5)/3
```

Rule 2207

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[(c + d*x)^m*((b*F^(g*(e + f*x)))^n/(f*g*n*Log[F])),
x] - Dist[d*(m/(f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !TrueQ[$UseGamma]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2227

```
Int[(F_)^((c_.)*(v_))*(u_), x_Symbol] :> Int[ExpandIntegrand[F^(c*ExpandToS
um[v, x]), u, x], x] /; FreeQ[{F, c}, x] && PolynomialQ[u, x] && LinearQ[v,
 x] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\int e^{3x}(-8+2x^3+x^5)\,dx = \int (-8e^{3x}+2e^{3x}x^3+e^{3x}x^5)\,dx$$
$$= 2\int e^{3x}x^3\,dx - 8\int e^{3x}\,dx + \int e^{3x}x^5\,dx$$
$$= -\frac{8e^{3x}}{3} + \frac{2}{3}e^{3x}x^3 + \frac{1}{3}e^{3x}x^5 - \frac{5}{3}\int e^{3x}x^4\,dx - 2\int e^{3x}x^2\,dx$$
$$= -\frac{8e^{3x}}{3} - \frac{2}{3}e^{3x}x^2 + \frac{2}{3}e^{3x}x^3 - \frac{5}{9}e^{3x}x^4 + \frac{1}{3}e^{3x}x^5 + \frac{4}{3}\int e^{3x}x\,dx + \frac{20}{9}\int e^{3x}x^3\,dx$$
$$= -\frac{8e^{3x}}{3} + \frac{4}{9}e^{3x}x - \frac{2}{3}e^{3x}x^2 + \frac{38}{27}e^{3x}x^3 - \frac{5}{9}e^{3x}x^4 + \frac{1}{3}e^{3x}x^5 - \frac{4}{9}\int e^{3x}\,dx - \frac{20}{9}\int$$
$$= -\frac{76e^{3x}}{27} + \frac{4}{9}e^{3x}x - \frac{38}{27}e^{3x}x^2 + \frac{38}{27}e^{3x}x^3 - \frac{5}{9}e^{3x}x^4 + \frac{1}{3}e^{3x}x^5 + \frac{40}{27}\int e^{3x}x\,dx$$
$$= -\frac{76e^{3x}}{27} + \frac{76}{81}e^{3x}x - \frac{38}{27}e^{3x}x^2 + \frac{38}{27}e^{3x}x^3 - \frac{5}{9}e^{3x}x^4 + \frac{1}{3}e^{3x}x^5 - \frac{40}{81}\int e^{3x}\,dx$$
$$= -\frac{724e^{3x}}{243} + \frac{76}{81}e^{3x}x - \frac{38}{27}e^{3x}x^2 + \frac{38}{27}e^{3x}x^3 - \frac{5}{9}e^{3x}x^4 + \frac{1}{3}e^{3x}x^5$$

Mathematica [A]
time = 0.06, size = 34, normalized size = 0.50

$$\frac{1}{243}e^{3x}(-724+228x-342x^2+342x^3-135x^4+81x^5)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(3*x)*(-8 + 2*x^3 + x^5),x]
[Out] (E^(3*x)*(-724 + 228*x - 342*x^2 + 342*x^3 - 135*x^4 + 81*x^5))/243
```

Maple [A]
time = 0.02, size = 51, normalized size = 0.75

method	result	size
risch	$\left(\frac{1}{3}x^5-\frac{5}{9}x^4+\frac{38}{27}x^3-\frac{38}{27}x^2+\frac{76}{81}x-\frac{724}{243}\right)e^{3x}$	31
gosper	$\frac{e^{3x}(81x^5-135x^4+342x^3-342x^2+228x-724)}{243}$	32
derivativedivides	$-\frac{724\,e^{3x}}{243}+\frac{76\,e^{3x}x}{81}-\frac{38\,e^{3x}x^2}{27}+\frac{38\,e^{3x}x^3}{27}-\frac{5\,e^{3x}x^4}{9}+\frac{e^{3x}x^5}{3}$	51
default	$-\frac{724\,e^{3x}}{243}+\frac{76\,e^{3x}x}{81}-\frac{38\,e^{3x}x^2}{27}+\frac{38\,e^{3x}x^3}{27}-\frac{5\,e^{3x}x^4}{9}+\frac{e^{3x}x^5}{3}$	51
norman	$-\frac{724\,e^{3x}}{243}+\frac{76\,e^{3x}x}{81}-\frac{38\,e^{3x}x^2}{27}+\frac{38\,e^{3x}x^3}{27}-\frac{5\,e^{3x}x^4}{9}+\frac{e^{3x}x^5}{3}$	51
meijerg	$\frac{724}{243}-\frac{(-1458x^5+2430x^4-3240x^3+3240x^2-2160x+720)e^{3x}}{4374}-\frac{(-108x^3+108x^2-72x+24)e^{3x}}{162}-\frac{8\,e^{3x}}{3}$	61

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(3*x)*(x^5+2*x^3-8),x,method=_RETURNVERBOSE)
```

```
[Out] -724/243*exp(3*x)+76/81*exp(3*x)*x-38/27*exp(3*x)*x^2+38/27*exp(3*x)*x^3-5/
9*exp(3*x)*x^4+1/3*exp(3*x)*x^5
```

Maxima [A]
time = 0.29, size = 59, normalized size = 0.87

$$\frac{1}{243}\left(81\,x^{5}-135\,x^{4}+180\,x^{3}-180\,x^{2}+120\,x-40\right)e^{(3\,x)}+\frac{2}{27}\left(9\,x^{3}-9\,x^{2}+6\,x-2\right)e^{(3\,x)}-\frac{8}{3}\,e^{(3\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)*(x^5+2*x^3-8),x, algorithm="maxima")
```

```
[Out] 1/243*(81*x^5 - 135*x^4 + 180*x^3 - 180*x^2 + 120*x - 40)*e^(3*x) + 2/27*(9
*x^3 - 9*x^2 + 6*x - 2)*e^(3*x) - 8/3*e^(3*x)
```

Fricas [A]
time = 0.36, size = 31, normalized size = 0.46

$$\frac{1}{243}\left(81\,x^{5}-135\,x^{4}+342\,x^{3}-342\,x^{2}+228\,x-724\right)e^{(3\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)*(x^5+2*x^3-8),x, algorithm="fricas")
```

```
[Out] 1/243*(81*x^5 - 135*x^4 + 342*x^3 - 342*x^2 + 228*x - 724)*e^(3*x)
```

Sympy [A]
time = 0.03, size = 31, normalized size = 0.46

$$\frac{\left(81x^{5}-135x^{4}+342x^{3}-342x^{2}+228x-724\right)e^{3x}}{243}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)*(x**5+2*x**3-8),x)
```

```
[Out] (81*x**5 - 135*x**4 + 342*x**3 - 342*x**2 + 228*x - 724)*exp(3*x)/243
```

Giac [A]
time = 3.45, size = 31, normalized size = 0.46

$$\frac{1}{243}\left(81\,x^{5}-135\,x^{4}+342\,x^{3}-342\,x^{2}+228\,x-724\right)e^{(3\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)*(x^5+2*x^3-8),x, algorithm="giac")
```

```
[Out] 1/243*(81*x^5 - 135*x^4 + 342*x^3 - 342*x^2 + 228*x - 724)*e^(3*x)
```

Mupad [B]
time = 3.53, size = 31, normalized size = 0.46

$$\frac{e^{3x}\left(81x^5-135x^4+342x^3-342x^2+228x-724\right)}{243}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(3*x)*(2*x^3 + x^5 - 8),x)
```

```
[Out] (exp(3*x)*(228*x - 342*x^2 + 342*x^3 - 135*x^4 + 81*x^5 - 724))/243
```

3.674 $\int (e^x + x)^2 \, dx$

Optimal. Leaf size=28

$$-2e^x + \frac{e^{2x}}{2} + 2e^x x + \frac{x^3}{3}$$

```
[Out] -2*exp(x)+1/2*exp(2*x)+2*exp(x)*x+1/3*x^3
```

Rubi [A]
time = 0.02, antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.429$, Rules used = {6874, 2225, 2207}

$$\frac{x^3}{3} + 2e^x x - 2e^x + \frac{e^{2x}}{2}$$

Antiderivative was successfully verified.

```
[In] Int[(E^x + x)^2,x]
```

```
[Out] -2*E^x + E^(2*x)/2 + 2*E^x*x + x^3/3
```

Rule 2207

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[(c + d*x)^m*((b*F^(g*(e + f*x)))^n/(f*g*n*Log[F])),
x] - Dist[d*(m/(f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !TrueQ[$UseGamma]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int (e^x + x)^2 \, dx = \int \left(e^{2x} + 2e^x x + x^2\right) \, dx$$
$$= \frac{x^3}{3} + 2\int e^x x \, dx + \int e^{2x} \, dx$$
$$= \frac{e^{2x}}{2} + 2e^x x + \frac{x^3}{3} - 2\int e^x \, dx$$
$$= -2e^x + \frac{e^{2x}}{2} + 2e^x x + \frac{x^3}{3}$$

Mathematica [A]
time = 0.03, size = 26, normalized size = 0.93

$$\frac{e^{2x}}{2} + \frac{x^3}{3} + e^x(-2 + 2x)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^x + x)^2,x]
```

```
[Out] E^(2*x)/2 + x^3/3 + E^x*(-2 + 2*x)
```

Maple [A]
time = 0.02, size = 22, normalized size = 0.79

method	result	size
risch	$\frac{x^3}{3} + (-2 + 2x)\,\mathrm{e}^x + \frac{\mathrm{e}^{2x}}{2}$	21
default	$-2\,\mathrm{e}^x + \frac{\mathrm{e}^{2x}}{2} + 2\,\mathrm{e}^x x + \frac{x^3}{3}$	22
norman	$-2\,\mathrm{e}^x + \frac{\mathrm{e}^{2x}}{2} + 2\,\mathrm{e}^x x + \frac{x^3}{3}$	22

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(x)+x)^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/3*x^3+1/2*exp(x)^2+2*exp(x)*x-2*exp(x)
```

Maxima [A]
time = 0.29, size = 19, normalized size = 0.68

$$\frac{1}{3}\,x^3 + 2\,(x-1)e^x + \frac{1}{2}\,e^{(2\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(x)+x)^2,x, algorithm="maxima")
```

```
[Out] 1/3*x^3 + 2*(x - 1)*e^x + 1/2*e^(2*x)
```

Fricas [A]
time = 0.48, size = 19, normalized size = 0.68

$$\frac{1}{3}\,x^3 + 2\,(x-1)e^x + \frac{1}{2}\,e^{(2\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(x)+x)^2,x, algorithm="fricas")
[Out] 1/3*x^3 + 2*(x - 1)*e^x + 1/2*e^(2*x)
```

Sympy [A]
time = 0.03, size = 20, normalized size = 0.71

$$\frac{x^3}{3} + \frac{(4x-4)\,e^x}{2} + \frac{e^{2x}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(x)+x)**2,x)
[Out] x**3/3 + (4*x - 4)*exp(x)/2 + exp(2*x)/2
```

Giac [A]
time = 3.59, size = 19, normalized size = 0.68

$$\frac{1}{3}\,x^3 + 2\,(x-1)e^x + \frac{1}{2}\,e^{(2\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(x)+x)^2,x, algorithm="giac")
[Out] 1/3*x^3 + 2*(x - 1)*e^x + 1/2*e^(2*x)
```

Mupad [B]
time = 3.50, size = 21, normalized size = 0.75

$$\frac{\mathrm{e}^{2\,x}}{2} - 2\,\mathrm{e}^x + 2\,x\,\mathrm{e}^x + \frac{x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x + exp(x))^2,x)
[Out] exp(2*x)/2 - 2*exp(x) + 2*x*exp(x) + x^3/3
```

3.675 $\int e^{-4x}(e^x + e^{2x} + e^{3x})\, dx$

Optimal. Leaf size=26

$$-\frac{1}{3}e^{-3x} - \frac{e^{-2x}}{2} - e^{-x}$$

```
[Out] -1/3/exp(3*x)-1/2/exp(2*x)-1/exp(x)
```

Rubi [A]

time = 0.01, antiderivative size = 26, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2320, 14}

$$-\frac{1}{3}e^{-3x} - \frac{e^{-2x}}{2} - e^{-x}$$

Antiderivative was successfully verified.

```
[In] Int[(E^x + E^(2*x) + E^(3*x))/E^(4*x),x]
```

```
[Out] -1/3*1/E^(3*x) - 1/(2*E^(2*x)) - E^(-x)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}
\int e^{-4x}\left(e^x + e^{2x} + e^{3x}\right)\, dx &= \text{Subst}\left(\int \frac{1 + x + x^2}{x^4}\, dx, x, e^x\right)\\
&= \text{Subst}\left(\int \left(\frac{1}{x^4} + \frac{1}{x^3} + \frac{1}{x^2}\right)\, dx, x, e^x\right)\\
&= -\frac{1}{3}e^{-3x} - \frac{e^{-2x}}{2} - e^{-x}
\end{aligned}$$

Mathematica [A]
time = 0.02, size = 23, normalized size = 0.88

$$\frac{1}{6}e^{-3x}\left(-2-3e^{x}-6e^{2x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^x + E^(2*x) + E^(3*x))/E^(4*x),x]
[Out] (-2 - 3*E^x - 6*E^(2*x))/(6*E^(3*x))
```

Maple [A]
time = 0.02, size = 20, normalized size = 0.77

method	result	size
default	$-\frac{e^{-3x}}{3}-\frac{e^{-2x}}{2}-e^{-x}$	20
risch	$-\frac{e^{-3x}}{3}-\frac{e^{-2x}}{2}-e^{-x}$	20
meijerg	$\frac{11}{6}-\frac{e^{-3x}}{3}-\frac{e^{-2x}}{2}-e^{-x}$	21
norman	$\left(-\frac{e^{2x}}{2}-e^{3x}-\frac{e^{x}}{3}\right)e^{-4x}$	23

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(x)+exp(2*x)+exp(3*x))/exp(4*x),x,method=_RETURNVERBOSE)
[Out] -1/3/exp(x)^3-1/2/exp(x)^2-1/exp(x)
```

Maxima [A]
time = 0.28, size = 19, normalized size = 0.73

$$-e^{(-x)}-\frac{1}{2}\,e^{(-2\,x)}-\frac{1}{3}\,e^{(-3\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(x)+exp(2*x)+exp(3*x))/exp(4*x),x, algorithm="maxima")
[Out] -e^(-x) - 1/2*e^(-2*x) - 1/3*e^(-3*x)
```

Fricas [A]
time = 0.38, size = 18, normalized size = 0.69

$$-\frac{1}{6}\left(6\,e^{(2\,x)}+3\,e^{x}+2\right)e^{(-3\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(x)+exp(2*x)+exp(3*x))/exp(4*x),x, algorithm="fricas")
```

```
[Out] -1/6*(6*e^(2*x) + 3*e^x + 2)*e^(-3*x)
```

Sympy [A]
time = 0.03, size = 22, normalized size = 0.85

$$-e^{-x} - \frac{e^{-2x}}{2} - \frac{e^{-3x}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(x)+exp(2*x)+exp(3*x))/exp(4*x),x)
[Out] -exp(-x) - exp(-2*x)/2 - exp(-3*x)/3
```

Giac [A]
time = 3.79, size = 18, normalized size = 0.69

$$-\frac{1}{6} \left(6 e^{(2 x)} + 3 e^{x} + 2\right) e^{(-3 x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(x)+exp(2*x)+exp(3*x))/exp(4*x),x, algorithm="giac")
[Out] -1/6*(6*e^(2*x) + 3*e^x + 2)*e^(-3*x)
```

Mupad [B]
time = 0.07, size = 18, normalized size = 0.69

$$-\frac{e^{-3 x} \left(6 e^{2 x} + 3 e^{x} + 2\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-4*x)*(exp(2*x) + exp(3*x) + exp(x)),x)
[Out] -(exp(-3*x)*(6*exp(2*x) + 3*exp(x) + 2))/6
```

3.676 $\int \frac{e^x}{1+2e^x+e^{2x}} \, dx$

Optimal. Leaf size=9

$$-\frac{1}{1+e^x}$$

```
[Out] -1/(1+exp(x))
```

Rubi [A]
time = 0.02, antiderivative size = 9, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2320, 32}

$$-\frac{1}{e^x+1}$$

Antiderivative was successfully verified.

```
[In] Int[E^x/(1 + 2*E^x + E^(2*x)),x]
```

```
[Out] -(1 + E^x)^(-1)
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned} \int \frac{e^x}{1+2e^x+e^{2x}} \, dx &= \text{Subst}\left(\int \frac{1}{(1+x)^2} \, dx, x, e^x\right) \\ &= -\frac{1}{1+e^x} \end{aligned}$$

Mathematica [A]
time = 0.00, size = 9, normalized size = 1.00

$$\frac{1}{-1-e^x}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(1 + 2*E^x + E^(2*x)),x]
```

```
[Out] (-1 - E^x)^(-1)
```

Maple [A]
time = 0.01, size = 9, normalized size = 1.00

method	result	size
default	$-\frac{1}{1+{\mathrm e}^{x}}$	9
norman	$-\frac{1}{1+{\mathrm e}^{x}}$	9
risch	$-\frac{1}{1+{\mathrm e}^{x}}$	9

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(1+2*exp(x)+exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/(1+exp(x))
```

Maxima [A]
time = 0.29, size = 8, normalized size = 0.89

$$-\frac{1}{e^x + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+2*exp(x)+exp(2*x)),x, algorithm="maxima")
```

```
[Out] -1/(e^x + 1)
```

Fricas [A]
time = 0.36, size = 8, normalized size = 0.89

$$-\frac{1}{e^x + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+2*exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] -1/(e^x + 1)
```

Sympy [A]
time = 0.02, size = 7, normalized size = 0.78

$$-\frac{1}{e^x + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+2*exp(x)+exp(2*x)),x)
[Out] -1/(exp(x) + 1)
```

Giac [A]
time = 3.24, size = 8, normalized size = 0.89

$$-\frac{1}{e^x + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+2*exp(x)+exp(2*x)),x, algorithm="giac")
[Out] -1/(e^x + 1)
```

Mupad [B]
time = 0.06, size = 8, normalized size = 0.89

$$-\frac{1}{\mathrm{e}^x + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(2*x) + 2*exp(x) + 1),x)
[Out] -1/(exp(x) + 1)
```

3.677 $\int e^{-x}\cos(3x)\,dx$

Optimal. Leaf size=27

$$-\frac{1}{10}e^{-x}\cos(3x)+\frac{3}{10}e^{-x}\sin(3x)$$

```
[Out] -1/10*cos(3*x)/exp(x)+3/10*sin(3*x)/exp(x)
```

Rubi [A]
time = 0.01, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {4518}

$$\frac{3}{10}e^{-x}\sin(3x)-\frac{1}{10}e^{-x}\cos(3x)$$

Antiderivative was successfully verified.

```
[In] Int[Cos[3*x]/E^x,x]
```

```
[Out] -1/10*Cos[3*x]/E^x + (3*Sin[3*x])/(10*E^x)
```

Rule 4518

```
Int[Cos[(d_.) + (e_.)*(x_)]*(F_)^((c_.)*((a_.) + (b_.)*(x_))), x_Symbol] :>
 Simp[b*c*Log[F]*F^(c*(a + b*x))*(Cos[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x
] + Simp[e*F^(c*(a + b*x))*(Sin[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x] /; F
reeQ[{F, a, b, c, d, e}, x] && NeQ[e^2 + b^2*c^2*Log[F]^2, 0]
```

Rubi steps

$$\int e^{-x}\cos(3x)\,dx=-\frac{1}{10}e^{-x}\cos(3x)+\frac{3}{10}e^{-x}\sin(3x)$$

Mathematica [A]
time = 0.02, size = 20, normalized size = 0.74

$$-\frac{1}{10}e^{-x}(\cos(3x)-3\sin(3x))$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[3*x]/E^x,x]
```

```
[Out] -1/10*(Cos[3*x] - 3*Sin[3*x])/E^x
```

Maple [A]
time = 0.03, size = 22, normalized size = 0.81

method	result	size
default	$-\frac{e^{-x}\cos(3x)}{10}+\frac{3\,e^{-x}\sin(3x)}{10}$	22
norman	$\frac{\left(-\frac{1}{10}+\frac{\left(\tan^2\left(\frac{3x}{2}\right)\right)}{10}+\frac{3\tan\left(\frac{3x}{2}\right)}{5}\right)e^{-x}}{1+\tan^2\left(\frac{3x}{2}\right)}$	32
risch	$-\frac{e^{(-1+3i)x}}{20}-\frac{3ie^{(-1+3i)x}}{20}-\frac{e^{(-1-3i)x}}{20}+\frac{3ie^{(-1-3i)x}}{20}$	36

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(3*x)/exp(x),x,method=_RETURNVERBOSE)
[Out] -1/10*exp(-x)*cos(3*x)+3/10*exp(-x)*sin(3*x)
```

Maxima [A]
time = 0.28, size = 17, normalized size = 0.63

$$-\frac{1}{10}\left(\cos\left(3\,x\right)-3\,\sin\left(3\,x\right)\right)e^{(-x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(3*x)/exp(x),x, algorithm="maxima")
[Out] -1/10*(cos(3*x) - 3*sin(3*x))*e^(-x)
```

Fricas [A]
time = 0.35, size = 21, normalized size = 0.78

$$-\frac{1}{10}\cos\left(3\,x\right)e^{(-x)}+\frac{3}{10}\,e^{(-x)}\sin\left(3\,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(3*x)/exp(x),x, algorithm="fricas")
[Out] -1/10*cos(3*x)*e^(-x) + 3/10*e^(-x)*sin(3*x)
```

Sympy [A]
time = 0.16, size = 20, normalized size = 0.74

$$\frac{3e^{-x}\sin\left(3x\right)}{10}-\frac{e^{-x}\cos\left(3x\right)}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(3*x)/exp(x),x)
[Out] 3*exp(-x)*sin(3*x)/10 - exp(-x)*cos(3*x)/10
```

Giac [A]
time = 3.91, size = 17, normalized size = 0.63

$$-\frac{1}{10}\left(\cos\left(3\,x\right)-3\,\sin\left(3\,x\right)\right)e^{\left(-x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(3*x)/exp(x),x, algorithm="giac")
[Out] -1/10*(cos(3*x) - 3*sin(3*x))*e^(-x)
```

Mupad [B]
time = 0.03, size = 17, normalized size = 0.63

$$-\frac{e^{-x}\left(\cos\left(3\,x\right)-3\,\sin\left(3\,x\right)\right)}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(3*x)*exp(-x),x)
[Out] -(exp(-x)*(cos(3*x) - 3*sin(3*x)))/10
```

3.678 $\int \frac{e^{2x}}{2+3e^x+e^{2x}}\,dx$

Optimal. Leaf size=17

$$-\log(1+e^x)+2\log(2+e^x)$$

[Out] -ln(1+exp(x))+2*ln(2+exp(x))

Rubi [A]
time = 0.02, antiderivative size = 17, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.150$, Rules used = {2320, 646, 31}

$$2\log(e^x+2)-\log(e^x+1)$$

Antiderivative was successfully verified.

[In] Int[E^(2*x)/(2 + 3*E^x + E^(2*x)),x]

[Out] -Log[1 + E^x] + 2*Log[2 + E^x]

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 646

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> W
ith[{q = Rt[b^2 - 4*a*c, 2]}, Dist[(c*d - e*(b/2 - q/2))/q, Int[1/(b/2 - q/
2 + c*x), x], x] - Dist[(c*d - e*(b/2 + q/2))/q, Int[1/(b/2 + q/2 + c*x), x
], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[2*c*d - b*e, 0] && NeQ[b^2 - 4*a
*c, 0] && NiceSqrtQ[b^2 - 4*a*c]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{e^{2x}}{2+3e^x+e^{2x}}\,dx = \text{Subst}\left(\int \frac{x}{2+3x+x^2}\,dx, x, e^x\right)$$
$$= 2\text{Subst}\left(\int \frac{1}{2+x}\,dx, x, e^x\right) - \text{Subst}\left(\int \frac{1}{1+x}\,dx, x, e^x\right)$$
$$= -\log(1+e^x) + 2\log(2+e^x)$$

<u>**Mathematica**</u> [A]
time = 0.03, size = 17, normalized size = 1.00

$$-\log(1+e^x) + 2\log(2+e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(2*x)/(2 + 3*E^x + E^(2*x)),x]
[Out] -Log[1 + E^x] + 2*Log[2 + E^x]
```

<u>**Maple**</u> [A]
time = 0.02, size = 16, normalized size = 0.94

method	result	size
default	$-\ln(1+e^x)+2\ln(2+e^x)$	16
norman	$-\ln(1+e^x)+2\ln(2+e^x)$	16
risch	$-\ln(1+e^x)+2\ln(2+e^x)$	16

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(2+3*exp(x)+exp(2*x)),x,method=_RETURNVERBOSE)
[Out] -ln(1+exp(x))+2*ln(2+exp(x))
```

<u>**Maxima**</u> [A]
time = 0.31, size = 15, normalized size = 0.88

$$2\,\log(e^x+2) - \log(e^x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(2+3*exp(x)+exp(2*x)),x, algorithm="maxima")
[Out] 2*log(e^x + 2) - log(e^x + 1)
```

<u>**Fricas**</u> [A]
time = 0.36, size = 15, normalized size = 0.88

$$2\,\log(e^x+2) - \log(e^x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(2+3*exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] 2*log(e^x + 2) - log(e^x + 1)
```

Sympy [A]
time = 0.04, size = 14, normalized size = 0.82

$$-\log\left(e^{x}+1\right)+2\log\left(e^{x}+2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(2+3*exp(x)+exp(2*x)),x)
```

```
[Out] -log(exp(x) + 1) + 2*log(exp(x) + 2)
```

Giac [A]
time = 4.63, size = 15, normalized size = 0.88

$$2\,\log\left(e^{x}+2\right)-\log\left(e^{x}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(2+3*exp(x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] 2*log(e^x + 2) - log(e^x + 1)
```

Mupad [B]
time = 3.54, size = 15, normalized size = 0.88

$$2\,\ln\left(\mathrm{e}^{x}+2\right)-\ln\left(\mathrm{e}^{x}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(exp(2*x) + 3*exp(x) + 2),x)
```

```
[Out] 2*log(exp(x) + 2) - log(exp(x) + 1)
```

3.679 $\int \frac{e^{2x}}{1+e^x} \, dx$

Optimal. Leaf size=12

$$e^x - \log(1 + e^x)$$

[Out] exp(x)-ln(1+exp(x))

Rubi [A]
time = 0.01, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2280, 45}

$$e^x - \log(e^x + 1)$$

Antiderivative was successfully verified.

[In] Int[E^(2*x)/(1 + E^x),x]

[Out] E^x - Log[1 + E^x]

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{e^{2x}}{1+e^x} \, dx &= \text{Subst}\left(\int \frac{x}{1+x} \, dx, x, e^x\right) \\
&= \text{Subst}\left(\int \left(1 + \frac{1}{-1-x}\right) \, dx, x, e^x\right) \\
&= e^x - \log(1 + e^x)
\end{aligned}$$

Mathematica [A]
time = 0.01, size = 12, normalized size = 1.00

$$e^x - \log(1 + e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(2*x)/(1 + E^x),x]
```

```
[Out] E^x - Log[1 + E^x]
```

Maple [A]
time = 0.02, size = 11, normalized size = 0.92

method	result	size
default	$e^x - \ln(1 + e^x)$	11
norman	$e^x - \ln(1 + e^x)$	11
risch	$e^x - \ln(1 + e^x)$	11

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(1+exp(x)),x,method=_RETURNVERBOSE)
```

```
[Out] exp(x)-ln(1+exp(x))
```

Maxima [A]
time = 0.29, size = 10, normalized size = 0.83

$$e^x - \log(e^x + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(x)),x, algorithm="maxima")
```

```
[Out] e^x - log(e^x + 1)
```

Fricas [A]
time = 0.35, size = 10, normalized size = 0.83

$$e^x - \log(e^x + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(x)),x, algorithm="fricas")
```

```
[Out] e^x - log(e^x + 1)
```

Sympy [A]
time = 0.02, size = 8, normalized size = 0.67

$$e^x - \log(e^x + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(x)),x)
```

```
[Out] exp(x) - log(exp(x) + 1)
```

Giac [A]
time = 5.72, size = 10, normalized size = 0.83

$$e^{x} - \log\left(e^{x} + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(x)),x, algorithm="giac")
```

```
[Out] e^x - log(e^x + 1)
```

Mupad [B]
time = 3.54, size = 10, normalized size = 0.83

$$\mathrm{e}^{x} - \ln\left(\mathrm{e}^{x} + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(exp(x) + 1),x)
```

```
[Out] exp(x) - log(exp(x) + 1)
```

3.680 $\int e^{3x}\cos(5x)\,dx$

Optimal. Leaf size=27

$$\frac{3}{34}e^{3x}\cos(5x)+\frac{5}{34}e^{3x}\sin(5x)$$

```
[Out] 3/34*exp(3*x)*cos(5*x)+5/34*exp(3*x)*sin(5*x)
```

Rubi [A]

time = 0.01, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}=0.100$, Rules used = {4518}

$$\frac{5}{34}e^{3x}\sin(5x)+\frac{3}{34}e^{3x}\cos(5x)$$

Antiderivative was successfully verified.

```
[In] Int[E^(3*x)*Cos[5*x],x]
[Out] (3*E^(3*x)*Cos[5*x])/34 + (5*E^(3*x)*Sin[5*x])/34
```

Rule 4518

```
Int[Cos[(d_.) + (e_.)*(x_)]*(F_)^((c_.)*((a_.) + (b_.)*(x_))), x_Symbol] :>
 Simp[b*c*Log[F]*F^(c*(a + b*x))*(Cos[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x
] + Simp[e*F^(c*(a + b*x))*(Sin[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x] /; F
reeQ[{F, a, b, c, d, e}, x] && NeQ[e^2 + b^2*c^2*Log[F]^2, 0]
```

Rubi steps

$$\int e^{3x}\cos(5x)\,dx=\frac{3}{34}e^{3x}\cos(5x)+\frac{5}{34}e^{3x}\sin(5x)$$

Mathematica [A]

time = 0.02, size = 22, normalized size = 0.81

$$\frac{1}{34}e^{3x}(3\cos(5x)+5\sin(5x))$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(3*x)*Cos[5*x],x]
[Out] (E^(3*x)*(3*Cos[5*x] + 5*Sin[5*x]))/34
```

Maple [A]

time = 0.03, size = 22, normalized size = 0.81

method	result	size
default	$\frac{3\,\mathrm{e}^{3x}\cos(5x)}{34}+\frac{5\,\mathrm{e}^{3x}\sin(5x)}{34}$	22
risch	$\frac{3\,\mathrm{e}^{(3+5i)x}}{68}-\frac{5i\mathrm{e}^{(3+5i)x}}{68}+\frac{3\,\mathrm{e}^{(3-5i)x}}{68}+\frac{5i\mathrm{e}^{(3-5i)x}}{68}$	36
norman	$\frac{\frac{5\,\mathrm{e}^{3x}\tan\left(\frac{5x}{2}\right)}{17}-\frac{3\,\mathrm{e}^{3x}\left(\tan^{2}\left(\frac{5x}{2}\right)\right)}{34}+\frac{3\,\mathrm{e}^{3x}}{34}}{1+\tan^{2}\left(\frac{5x}{2}\right)}$	41

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(3*x)*cos(5*x),x,method=_RETURNVERBOSE)
```

```
[Out] 3/34*exp(3*x)*cos(5*x)+5/34*exp(3*x)*sin(5*x)
```

Maxima [A]
time = 0.29, size = 19, normalized size = 0.70

$$\frac{1}{34}\,(3\,\cos\left(5\,x\right)+5\,\sin\left(5\,x\right))e^{(3\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)*cos(5*x),x, algorithm="maxima")
```

```
[Out] 1/34*(3*cos(5*x) + 5*sin(5*x))*e^(3*x)
```

Fricas [A]
time = 0.36, size = 21, normalized size = 0.78

$$\frac{3}{34}\,\cos\left(5\,x\right)e^{(3\,x)}+\frac{5}{34}\,e^{(3\,x)}\sin\left(5\,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)*cos(5*x),x, algorithm="fricas")
```

```
[Out] 3/34*cos(5*x)*e^(3*x) + 5/34*e^(3*x)*sin(5*x)
```

Sympy [A]
time = 0.08, size = 26, normalized size = 0.96

$$\frac{5e^{3x}\sin\left(5x\right)}{34}+\frac{3e^{3x}\cos\left(5x\right)}{34}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)*cos(5*x),x)
```

```
[Out] 5*exp(3*x)*sin(5*x)/34 + 3*exp(3*x)*cos(5*x)/34
```

Giac [A]
time = 3.56, size = 19, normalized size = 0.70

$$\frac{1}{34}\,(3\,\cos\left(5\,x\right)+5\,\sin\left(5\,x\right))e^{\left(3\,x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)*cos(5*x),x, algorithm="giac")
[Out] 1/34*(3*cos(5*x) + 5*sin(5*x))*e^(3*x)
```

Mupad [B]
time = 0.03, size = 19, normalized size = 0.70

$$\frac{\mathrm{e}^{3\,x}\,\left(3\,\cos\left(5\,x\right)+5\,\sin\left(5\,x\right)\right)}{34}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(5*x)*exp(3*x),x)
[Out] (exp(3*x)*(3*cos(5*x) + 5*sin(5*x)))/34
```

3.681 $\int e^x \text{sech}(e^x)\,dx$

Optimal. Leaf size=5

$$\tan^{-1}(\sinh(e^x))$$

```
[Out] arctan(sinh(exp(x)))
```

Rubi [A]
time = 0.01, antiderivative size = 5, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.250$, Rules used = {2320, 3855}

$$\text{ArcTan}(\sinh(e^x))$$

Antiderivative was successfully verified.

```
[In] Int[E^x*Sech[E^x],x]
```

```
[Out] ArcTan[Sinh[E^x]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\int e^x \text{sech}(e^x)\,dx &= \text{Subst}\left(\int \text{sech}(x)\,dx, x, e^x\right)\\ &= \tan^{-1}(\sinh(e^x))\end{aligned}$$

Mathematica [A]
time = 0.01, size = 5, normalized size = 1.00

$$\tan^{-1}(\sinh(e^x))$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*Sech[E^x],x]
```

```
[Out] ArcTan[Sinh[E^x]]
```

Maple [A]
time = 0.02, size = 5, normalized size = 1.00

method	result	size
derivativedivides	$\arctan(\sinh(e^x))$	5
default	$\arctan(\sinh(e^x))$	5
risch	$i\ln\left(e^{e^x}+i\right)-i\ln\left(e^{e^x}-i\right)$	22

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*sech(exp(x)),x,method=_RETURNVERBOSE)
```

```
[Out] arctan(sinh(exp(x)))
```

Maxima [A]
time = 0.29, size = 4, normalized size = 0.80

$$\arctan(\sinh(e^x))$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*sech(exp(x)),x, algorithm="maxima")
```

```
[Out] arctan(sinh(e^x))
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 16 vs. 2(4) = 8.
time = 0.38, size = 16, normalized size = 3.20

$$2\arctan(\cosh(\cosh(x)+\sinh(x))+\sinh(\cosh(x)+\sinh(x)))$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*sech(exp(x)),x, algorithm="fricas")
```

```
[Out] 2*arctan(cosh(cosh(x) + sinh(x)) + sinh(cosh(x) + sinh(x)))
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int e^x \operatorname{sech}(e^x)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*sech(exp(x)),x)
```

```
[Out] Integral(exp(x)*sech(exp(x)), x)
```

Giac [A]
time = 4.14, size = 6, normalized size = 1.20

$$2 \arctan \left(e^{\left(e^{x}\right)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*sech(exp(x)),x, algorithm="giac")
```

```
[Out] 2*arctan(e^(e^x))
```

Mupad [B]
time = 0.05, size = 6, normalized size = 1.20

$$2 \operatorname{atan}\left(e^{e^{x}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/cosh(exp(x)),x)
```

```
[Out] 2*atan(exp(exp(x)))
```

3.682 $\int \frac{e^{-x}}{1+2e^x}\,dx$

Optimal. Leaf size=21

$$-e^{-x} - 2x + 2\log(1 + 2e^x)$$

```
[Out] -1/exp(x)-2*x+2*ln(1+2*exp(x))
```

Rubi [A]
time = 0.02, antiderivative size = 21, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {2280, 46}

$$-2x - e^{-x} + 2\log(2e^x + 1)$$

Antiderivative was successfully verified.

```
[In] Int[1/(E^x*(1 + 2*E^x)),x]
[Out] -E^(-x) - 2*x + 2*Log[1 + 2*E^x]
```

Rule 46

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[E
xpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m +
 n + 2, 0])
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{e^{-x}}{1+2e^x}\,dx &= \text{Subst}\left(\int \frac{1}{x^2(1+2x)}\,dx, x, e^x\right)\\
&= \text{Subst}\left(\int \left(\frac{1}{x^2} - \frac{2}{x} + \frac{4}{1+2x}\right)\,dx, x, e^x\right)\\
&= -e^{-x} - 2x + 2\log(1+2e^x)
\end{aligned}$$

Mathematica [A]
time = 0.02, size = 24, normalized size = 1.14

$$-e^{-x} - 2\log(e^x) + 2\log(1 + 2e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(E^x*(1 + 2*E^x)),x]
[Out] -E^(-x) - 2*Log[E^x] + 2*Log[1 + 2*E^x]
```

Maple [A]
time = 0.02, size = 22, normalized size = 1.05

method	result	size
risch	$-e^{-x} - 2x + 2\ln\left(e^x + \frac{1}{2}\right)$	18
derivativedivides	$2\ln(1 + 2e^x) - e^{-x} - 2\ln(e^x)$	22
default	$2\ln(1 + 2e^x) - e^{-x} - 2\ln(e^x)$	22
norman	$(-1 - 2e^x x)e^{-x} + 2\ln(1 + 2e^x)$	23

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/exp(x)/(1+2*exp(x)),x,method=_RETURNVERBOSE)
[Out] 2*ln(1+2*exp(x))-1/exp(x)-2*ln(exp(x))
```

Maxima [A]
time = 0.29, size = 16, normalized size = 0.76

$$-e^{(-x)} + 2\log\left(e^{(-x)} + 2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(x)/(1+2*exp(x)),x, algorithm="maxima")
[Out] -e^(-x) + 2*log(e^(-x) + 2)
```

Fricas [A]
time = 0.35, size = 24, normalized size = 1.14

$$-(2xe^x - 2e^x\log(2e^x + 1) + 1)e^{(-x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(x)/(1+2*exp(x)),x, algorithm="fricas")
[Out] -(2*x*e^x - 2*e^x*log(2*e^x + 1) + 1)*e^(-x)
```

Sympy [A]
time = 0.03, size = 17, normalized size = 0.81

$$-2x + 2\log\left(e^{x} + \frac{1}{2}\right) - e^{-x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(x)/(1+2*exp(x)),x)
[Out] -2*x + 2*log(exp(x) + 1/2) - exp(-x)
```

Giac [A]
time = 5.65, size = 19, normalized size = 0.90

$$-2\,x - e^{(-x)} + 2\,\log\left(2\,e^{x} + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(x)/(1+2*exp(x)),x, algorithm="giac")
[Out] -2*x - e^(-x) + 2*log(2*e^x + 1)
```

Mupad [B]
time = 0.07, size = 19, normalized size = 0.90

$$2\,\ln\left(2\,\mathrm{e}^{x} + 1\right) - 2\,x - \mathrm{e}^{-x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-x)/(2*exp(x) + 1),x)
[Out] 2*log(2*exp(x) + 1) - 2*x - exp(-x)
```

3.683 $\int e^x \cos(4+3x)\,dx$

Optimal. Leaf size=27

$$\frac{1}{10}e^x\cos(4+3x)+\frac{3}{10}e^x\sin(4+3x)$$

```
[Out] 1/10*exp(x)*cos(4+3*x)+3/10*exp(x)*sin(4+3*x)
```

Rubi [A]
time = 0.01, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {4518}

$$\frac{3}{10}e^x\sin(3x+4)+\frac{1}{10}e^x\cos(3x+4)$$

Antiderivative was successfully verified.

```
[In] Int[E^x*Cos[4 + 3*x],x]
```

```
[Out] (E^x*Cos[4 + 3*x])/10 + (3*E^x*Sin[4 + 3*x])/10
```

Rule 4518

```
Int[Cos[(d_.) + (e_.)*(x_)]*(F_)^((c_.)*((a_.) + (b_.)*(x_))), x_Symbol] :>
 Simp[b*c*Log[F]*F^(c*(a + b*x))*(Cos[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x
] + Simp[e*F^(c*(a + b*x))*(Sin[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x] /; F
reeQ[{F, a, b, c, d, e}, x] && NeQ[e^2 + b^2*c^2*Log[F]^2, 0]
```

Rubi steps

$$\int e^x\cos(4+3x)\,dx=\frac{1}{10}e^x\cos(4+3x)+\frac{3}{10}e^x\sin(4+3x)$$

Mathematica [A]
time = 0.03, size = 22, normalized size = 0.81

$$\frac{1}{10}e^x(\cos(4+3x)+3\sin(4+3x))$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*Cos[4 + 3*x],x]
```

```
[Out] (E^x*(Cos[4 + 3*x] + 3*Sin[4 + 3*x]))/10
```

Maple [A]
time = 0.04, size = 22, normalized size = 0.81

method	result	size
default	$\frac{e^{x} \cos(4+3x)}{10}+\frac{3\,e^{x} \sin(4+3x)}{10}$	22
risch	$\left(\frac{1}{20}-\frac{3i}{20}\right) e^{x} e^{3ix} e^{4i}+\left(\frac{1}{20}+\frac{3i}{20}\right) e^{x} e^{-3ix} e^{-4i}$	30
norman	$\frac{\frac{3\,e^{x} \tan\left(2+\frac{3x}{2}\right)}{5}-\frac{e^{x} \left(\tan^{2}\left(2+\frac{3x}{2}\right)\right)}{10}+\frac{e^{x}}{10}}{1+\tan^{2}\left(2+\frac{3x}{2}\right)}$	41

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*cos(4+3*x),x,method=_RETURNVERBOSE)
[Out] 1/10*exp(x)*cos(4+3*x)+3/10*exp(x)*sin(4+3*x)
```

Maxima [A]
time = 0.29, size = 19, normalized size = 0.70

$$\frac{1}{10}\left(\cos\left(3\,x+4\right)+3\,\sin\left(3\,x+4\right)\right)e^{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*cos(4+3*x),x, algorithm="maxima")
[Out] 1/10*(cos(3*x + 4) + 3*sin(3*x + 4))*e^x
```

Fricas [A]
time = 0.36, size = 21, normalized size = 0.78

$$\frac{1}{10}\,\cos\left(3\,x+4\right)e^{x}+\frac{3}{10}\,e^{x}\sin\left(3\,x+4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*cos(4+3*x),x, algorithm="fricas")
[Out] 1/10*cos(3*x + 4)*e^x + 3/10*e^x*sin(3*x + 4)
```

Sympy [A]
time = 0.08, size = 24, normalized size = 0.89

$$\frac{3e^{x}\sin\left(3x+4\right)}{10}+\frac{e^{x}\cos\left(3x+4\right)}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*cos(4+3*x),x)
[Out] 3*exp(x)*sin(3*x + 4)/10 + exp(x)*cos(3*x + 4)/10
```

Giac [A]
time = 4.32, size = 19, normalized size = 0.70

$$\frac{1}{10} (\cos(3x+4) + 3\sin(3x+4))e^{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*cos(4+3*x),x, algorithm="giac")
```

```
[Out] 1/10*(cos(3*x + 4) + 3*sin(3*x + 4))*e^x
```

Mupad [B]
time = 3.53, size = 19, normalized size = 0.70

$$\frac{e^{x} (\cos(3x+4) + 3\sin(3x+4))}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*cos(3*x + 4),x)
```

```
[Out] (exp(x)*(cos(3*x + 4) + 3*sin(3*x + 4)))/10
```

3.684 $\int e^x \sec^3(1-e^x)\,dx$

Optimal. Leaf size=34

$$-\frac{1}{2}\tanh^{-1}(\sin(1-e^x))-\frac{1}{2}\sec(1-e^x)\tan(1-e^x)$$

```
[Out] 1/2*arctanh(sin(-1+exp(x)))+1/2*sec(-1+exp(x))*tan(-1+exp(x))
```

Rubi [A]
time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.214$, Rules used = {2320, 3853, 3855}

$$-\frac{1}{2}\tanh^{-1}(\sin(1-e^x))-\frac{1}{2}\tan(1-e^x)\sec(1-e^x)$$

Antiderivative was successfully verified.

```
[In] Int[E^x*Sec[1 - E^x]^3,x]
```

```
[Out] -1/2*ArcTanh[Sin[1 - E^x]] - (Sec[1 - E^x]*Tan[1 - E^x])/2
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 3853

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(-b)*Cos[c + d*
x]*((b*Csc[c + d*x])^(n - 1)/(d*(n - 1))), x] + Dist[b^2*((n - 2)/(n - 1)),
 Int[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &
& IntegerQ[2*n]
```

Rule 3855

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[-ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int e^x \sec^3(1-e^x)\,dx = \text{Subst}\left(\int \sec^3(1-x)\,dx, x, e^x\right)$$
$$= -\frac{1}{2}\sec(1-e^x)\tan(1-e^x) + \frac{1}{2}\text{Subst}\left(\int \sec(1-x)\,dx, x, e^x\right)$$
$$= -\frac{1}{2}\tanh^{-1}(\sin(1-e^x)) - \frac{1}{2}\sec(1-e^x)\tan(1-e^x)$$

Mathematica [A]
time = 0.01, size = 34, normalized size = 1.00

$$-\frac{1}{2}\tanh^{-1}(\sin(1-e^x)) - \frac{1}{2}\sec(1-e^x)\tan(1-e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*Sec[1 - E^x]^3,x]
[Out] -1/2*ArcTanh[Sin[1 - E^x]] - (Sec[1 - E^x]*Tan[1 - E^x])/2
```

Maple [A]
time = 0.14, size = 28, normalized size = 0.82

method	result	size
derivativedivides	$\frac{\sec(-1+e^x)\tan(-1+e^x)}{2}+\frac{\ln(\sec(-1+e^x)+\tan(-1+e^x))}{2}$	28
default	$\frac{\sec(-1+e^x)\tan(-1+e^x)}{2}+\frac{\ln(\sec(-1+e^x)+\tan(-1+e^x))}{2}$	28
norman	$\frac{\tan^3\left(-\frac{1}{2}+\frac{e^x}{2}\right)+\tan\left(-\frac{1}{2}+\frac{e^x}{2}\right)}{\left(\tan^2\left(-\frac{1}{2}+\frac{e^x}{2}\right)-1\right)^2}-\frac{\ln\left(\tan\left(-\frac{1}{2}+\frac{e^x}{2}\right)-1\right)}{2}+\frac{\ln\left(\tan\left(-\frac{1}{2}+\frac{e^x}{2}\right)+1\right)}{2}$	57
risch	$-\frac{i\left(e^{3i(-1+e^x)}-e^{i(-1+e^x)}\right)}{\left(e^{2i(-1+e^x)}+1\right)^2}-\frac{\ln\left(e^{i(-1+e^x)}-i\right)}{2}+\frac{\ln\left(e^{i(-1+e^x)}+i\right)}{2}$	64

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*sec(-1+exp(x))^3,x,method=_RETURNVERBOSE)
[Out] 1/2*sec(-1+exp(x))*tan(-1+exp(x))+1/2*ln(sec(-1+exp(x))+tan(-1+exp(x)))
```

Maxima [A]
time = 0.29, size = 39, normalized size = 1.15

$$-\frac{\sin(e^x-1)}{2\left(\sin(e^x-1)^2-1\right)} + \frac{1}{4}\log(\sin(e^x-1)+1) - \frac{1}{4}\log(\sin(e^x-1)-1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*sec(-1+exp(x))^3,x, algorithm="maxima")
```

```
[Out] -1/2*sin(e^x - 1)/(sin(e^x - 1)^2 - 1) + 1/4*log(sin(e^x - 1) + 1) - 1/4*lo
g(sin(e^x - 1) - 1)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 52 vs. $2(21) = 42$.
time = 0.36, size = 52, normalized size = 1.53

$$\frac{\cos\left(e^{x}-1\right)^{2}\log\left(\sin\left(e^{x}-1\right)+1\right)-\cos\left(e^{x}-1\right)^{2}\log\left(-\sin\left(e^{x}-1\right)+1\right)+2\,\sin\left(e^{x}-1\right)}{4\,\cos\left(e^{x}-1\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*sec(-1+exp(x))^3,x, algorithm="fricas")
```

```
[Out] 1/4*(cos(e^x - 1)^2*log(sin(e^x - 1) + 1) - cos(e^x - 1)^2*log(-sin(e^x - 1
) + 1) + 2*sin(e^x - 1))/cos(e^x - 1)^2
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int e^{x}\sec^{3}\left(e^{x}-1\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*sec(-1+exp(x))**3,x)
```

```
[Out] Integral(exp(x)*sec(exp(x) - 1)**3, x)
```

Giac [A]
time = 3.56, size = 41, normalized size = 1.21

$$-\frac{\sin\left(e^{x}-1\right)}{2\left(\sin\left(e^{x}-1\right)^{2}-1\right)}+\frac{1}{4}\log\left(\sin\left(e^{x}-1\right)+1\right)-\frac{1}{4}\log\left(-\sin\left(e^{x}-1\right)+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*sec(-1+exp(x))^3,x, algorithm="giac")
```

```
[Out] -1/2*sin(e^x - 1)/(sin(e^x - 1)^2 - 1) + 1/4*log(sin(e^x - 1) + 1) - 1/4*lo
g(-sin(e^x - 1) + 1)
```

Mupad [B]
time = 5.53, size = 78, normalized size = 2.29

$$-\mathrm{atan}\left(\mathrm{e}^{-\mathrm{i}}\,\mathrm{e}^{\mathrm{e}^{x}\,1\mathrm{i}}\right)\,1\mathrm{i}-\frac{\mathrm{e}^{-\mathrm{i}}\,\mathrm{e}^{\mathrm{e}^{x}\,1\mathrm{i}}\,1\mathrm{i}}{\mathrm{e}^{-2\mathrm{i}}\,\mathrm{e}^{\mathrm{e}^{x}\,2\mathrm{i}}+1}+\frac{\mathrm{e}^{-\mathrm{i}}\,\mathrm{e}^{\mathrm{e}^{x}\,1\mathrm{i}}\,2\mathrm{i}}{2\,\mathrm{e}^{-2\mathrm{i}}\,\mathrm{e}^{\mathrm{e}^{x}\,2\mathrm{i}}+\mathrm{e}^{-4\mathrm{i}}\,\mathrm{e}^{\mathrm{e}^{x}\,4\mathrm{i}}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/cos(exp(x) - 1)^3,x)
```

```
[Out] (exp(-1i)*exp(exp(x)*1i)*2i)/(2*exp(-2i)*exp(exp(x)*2i) + exp(-4i)*exp(exp(
x)*4i) + 1) - (exp(-1i)*exp(exp(x)*1i)*1i)/(exp(-2i)*exp(exp(x)*2i) + 1) -
atan(exp(-1i)*exp(exp(x)*1i))*1i
```

3.685 $\int (e^{-x} + e^x) x \, dx$

Optimal. Leaf size=26

$$-e^{-x} - e^x - e^{-x}x + e^x x$$

```
[Out] -1/exp(x)-exp(x)-x/exp(x)+exp(x)*x
```

Rubi [A]
time = 0.01, antiderivative size = 26, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.273$, Rules used = {14, 2207, 2225}

$$-e^{-x}x + e^x x - e^{-x} - e^x$$

Antiderivative was successfully verified.

```
[In] Int[(E^(-x) + E^x)*x,x]
```

```
[Out] -E^(-x) - E^x - x/E^x + E^x*x
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2207

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[(c + d*x)^m*((b*F^(g*(e + f*x)))^n/(f*g*n*Log[F])),
x] - Dist[d*(m/(f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !TrueQ[$UseGamma]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rubi steps

$$
\begin{aligned}
\int \left(e^{-x}+e^{x}\right) x \, dx &= \int \left(e^{-x}x+e^{x}x\right) \, dx \\
&= \int e^{-x}x \, dx + \int e^{x}x \, dx \\
&= -e^{-x}x + e^{x}x + \int e^{-x} \, dx - \int e^{x} \, dx \\
&= -e^{-x} - e^{x} - e^{-x}x + e^{x}x
\end{aligned}
$$

Mathematica [A]
time = 0.03, size = 20, normalized size = 0.77

$$e^{-x}\left(-1+e^{2x}(-1+x)-x\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(-x) + E^x)*x,x]
```

```
[Out] (-1 + E^(2*x)*(-1 + x) - x)/E^x
```

Maple [A]
time = 0.02, size = 23, normalized size = 0.88

method	result	size
risch	$(-1+x)\,\mathrm{e}^{x}+(-1-x)\,\mathrm{e}^{-x}$	18
default	$-\mathrm{e}^{-x}-\mathrm{e}^{x}-x\,\mathrm{e}^{-x}+\mathrm{e}^{x}x$	23
norman	$\left(-1+x\,\mathrm{e}^{2x}-x-\mathrm{e}^{2x}\right)\mathrm{e}^{-x}$	23
meijerg	$2-\frac{(2+2x)\mathrm{e}^{-x}}{2}-\frac{(2-2x)\mathrm{e}^{x}}{2}$	23

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(-x)+exp(x))*x,x,method=_RETURNVERBOSE)
```

```
[Out] -1/exp(x)-exp(x)-x/exp(x)+exp(x)*x
```

Maxima [A]
time = 0.32, size = 16, normalized size = 0.62

$$-(x+1)e^{(-x)}+(x-1)e^{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-x)+exp(x))*x,x, algorithm="maxima")
```

```
[Out] -(x + 1)*e^(-x) + (x - 1)*e^x
```

Fricas [A]
time = 0.44, size = 18, normalized size = 0.69

$$\left((x-1)e^{(2\,x)}-x-1\right)e^{(-x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-x)+exp(x))*x,x, algorithm="fricas")
[Out] ((x - 1)*e^(2*x) - x - 1)*e^(-x)
```

Sympy [A]
time = 0.03, size = 14, normalized size = 0.54

$$\left(-x-1\right)e^{-x}+\left(x-1\right)e^{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-x)+exp(x))*x,x)
[Out] (-x - 1)*exp(-x) + (x - 1)*exp(x)
```

Giac [A]
time = 2.75, size = 16, normalized size = 0.62

$$-(x+1)e^{(-x)}+(x-1)e^{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-x)+exp(x))*x,x, algorithm="giac")
[Out] -(x + 1)*e^(-x) + (x - 1)*e^x
```

Mupad [B]
time = 0.06, size = 10, normalized size = 0.38

$$2\,x\sinh(x)-2\cosh(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(exp(-x) + exp(x)),x)
[Out] 2*x*sinh(x) - 2*cosh(x)
```

3.686 $\int \frac{e^x}{2+3e^x+e^{2x}} \, dx$

Optimal. Leaf size=15

$$\log(1+e^x)-\log(2+e^x)$$

[Out] ln(1+exp(x))-ln(2+exp(x))

Rubi [A]

time = 0.02, antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {2320, 630, 31}

$$\log(e^x+1)-\log(e^x+2)$$

Antiderivative was successfully verified.

[In] Int[E^x/(2 + 3*E^x + E^(2*x)),x]

[Out] Log[1 + E^x] - Log[2 + E^x]

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 630

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = Rt[b^2
 - 4*a*c, 2]}, Dist[c/q, Int[1/Simp[b/2 - q/2 + c*x, x], x], x] - Dist[c/q,
 Int[1/Simp[b/2 + q/2 + c*x, x], x], x]] /; FreeQ[{a, b, c}, x] && NeQ[b^2
- 4*a*c, 0] && PosQ[b^2 - 4*a*c] && PerfectSquareQ[b^2 - 4*a*c]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}
\int \frac{e^x}{2+3e^x+e^{2x}} \, dx &= \text{Subst}\left(\int \frac{1}{2+3x+x^2} \, dx, x, e^x\right)\\
&= \text{Subst}\left(\int \frac{1}{1+x} \, dx, x, e^x\right)-\text{Subst}\left(\int \frac{1}{2+x} \, dx, x, e^x\right)\\
&= \log(1+e^x)-\log(2+e^x)
\end{aligned}$$

Mathematica [A]
time = 0.02, size = 10, normalized size = 0.67

$$-2\tanh^{-1}(3+2e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(2 + 3*E^x + E^(2*x)),x]
[Out] -2*ArcTanh[3 + 2*E^x]
```

Maple [A]
time = 0.02, size = 14, normalized size = 0.93

method	result	size
default	$\ln(1+e^x)-\ln(2+e^x)$	14
norman	$\ln(1+e^x)-\ln(2+e^x)$	14
risch	$\ln(1+e^x)-\ln(2+e^x)$	14

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(2+3*exp(x)+exp(2*x)),x,method=_RETURNVERBOSE)
[Out] ln(1+exp(x))-ln(2+exp(x))
```

Maxima [A]
time = 0.29, size = 13, normalized size = 0.87

$$-\log(e^x+2)+\log(e^x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(2+3*exp(x)+exp(2*x)),x, algorithm="maxima")
[Out] -log(e^x + 2) + log(e^x + 1)
```

Fricas [A]
time = 0.44, size = 13, normalized size = 0.87

$$-\log(e^x+2)+\log(e^x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(2+3*exp(x)+exp(2*x)),x, algorithm="fricas")
[Out] -log(e^x + 2) + log(e^x + 1)
```

Sympy [A]
time = 0.04, size = 12, normalized size = 0.80

$$\log(e^x+1)-\log(e^x+2)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(2+3*exp(x)+exp(2*x)),x)
```

```
[Out] log(exp(x) + 1) - log(exp(x) + 2)
```

Giac [A]
time = 2.27, size = 13, normalized size = 0.87

$$-\log\left(e^{x}+2\right)+\log\left(e^{x}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(2+3*exp(x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] -log(e^x + 2) + log(e^x + 1)
```

Mupad [B]
time = 3.49, size = 13, normalized size = 0.87

$$\ln\left(\mathrm{e}^{x}+1\right)-\ln\left(\mathrm{e}^{x}+2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(2*x) + 3*exp(x) + 2),x)
```

```
[Out] log(exp(x) + 1) - log(exp(x) + 2)
```

3.687 $\int \frac{e^{2x}}{\sqrt[3]{1+e^x}}\,dx$

Optimal. Leaf size=27

$$-\frac{3}{2}(1+e^x)^{2/3}+\frac{3}{5}(1+e^x)^{5/3}$$

[Out] -3/2*(1+exp(x))^(2/3)+3/5*(1+exp(x))^(5/3)

Rubi [A]
time = 0.02, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2280, 45}

$$\frac{3}{5}(e^x+1)^{5/3}-\frac{3}{2}(e^x+1)^{2/3}$$

Antiderivative was successfully verified.

[In] Int[E^(2*x)/(1 + E^x)^(1/3),x]

[Out] (-3*(1 + E^x)^(2/3))/2 + (3*(1 + E^x)^(5/3))/5

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{2x}}{\sqrt[3]{1+e^x}}\,dx &= \text{Subst}\left(\int \frac{x}{\sqrt[3]{1+x}}\,dx,x,e^x\right)\\ &= \text{Subst}\left(\int \left(-\frac{1}{\sqrt[3]{1+x}}+(1+x)^{2/3}\right)\,dx,x,e^x\right)\\ &= -\frac{3}{2}(1+e^x)^{2/3}+\frac{3}{5}(1+e^x)^{5/3}\end{aligned}$$

Mathematica [A]
time = 0.02, size = 22, normalized size = 0.81

$$\frac{3}{10}(1+e^x)^{2/3}(-5+2(1+e^x))$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(2*x)/(1 + E^x)^(1/3),x]
[Out] (3*(1 + E^x)^(2/3)*(-5 + 2*(1 + E^x)))/10
```

Maple [A]
time = 0.02, size = 18, normalized size = 0.67

method	result	size
risch	$\frac{3(-3+2\,e^x)(1+e^x)^{\frac{2}{3}}}{10}$	15
default	$-\frac{3(1+e^x)^{\frac{2}{3}}}{2}+\frac{3(1+e^x)^{\frac{5}{3}}}{5}$	18

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(1+exp(x))^(1/3),x,method=_RETURNVERBOSE)
[Out] -3/2*(1+exp(x))^(2/3)+3/5*(1+exp(x))^(5/3)
```

Maxima [A]
time = 0.29, size = 17, normalized size = 0.63

$$\frac{3}{5}\,(e^x+1)^{\frac{5}{3}}-\frac{3}{2}\,(e^x+1)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(x))^(1/3),x, algorithm="maxima")
[Out] 3/5*(e^x + 1)^(5/3) - 3/2*(e^x + 1)^(2/3)
```

Fricas [A]
time = 0.39, size = 14, normalized size = 0.52

$$\frac{3}{10}\,(2\,e^x-3)(e^x+1)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(x))^(1/3),x, algorithm="fricas")
[Out] 3/10*(2*e^x - 3)*(e^x + 1)^(2/3)
```

Sympy [A]
time = 0.98, size = 22, normalized size = 0.81

$$\frac{3(e^x+1)^{\frac{5}{3}}}{5}-\frac{3(e^x+1)^{\frac{2}{3}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(x))**(1/3),x)
[Out] 3*(exp(x) + 1)**(5/3)/5 - 3*(exp(x) + 1)**(2/3)/2
```

Giac [A]
time = 3.77, size = 17, normalized size = 0.63

$$\frac{3}{5}\left(e^x+1\right)^{\frac{5}{3}}-\frac{3}{2}\left(e^x+1\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(x))^(1/3),x, algorithm="giac")
[Out] 3/5*(e^x + 1)^(5/3) - 3/2*(e^x + 1)^(2/3)
```

Mupad [B]
time = 0.06, size = 14, normalized size = 0.52

$$\frac{3\left(\mathrm{e}^x+1\right)^{2/3}\left(2\,\mathrm{e}^x-3\right)}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(exp(x) + 1)^(1/3),x)
[Out] (3*(exp(x) + 1)^(2/3)*(2*exp(x) - 3))/10
```

3.688 $\int \frac{e^{2x}}{\sqrt[4]{1+e^x}}\,dx$

Optimal. Leaf size=27

$$-\frac{4}{3}(1+e^x)^{3/4}+\frac{4}{7}(1+e^x)^{7/4}$$

[Out] -4/3*(1+exp(x))^(3/4)+4/7*(1+exp(x))^(7/4)

Rubi [A]
time = 0.02, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {2280, 45}

$$\frac{4}{7}(e^x+1)^{7/4}-\frac{4}{3}(e^x+1)^{3/4}$$

Antiderivative was successfully verified.

[In] Int[E^(2*x)/(1 + E^x)^(1/4),x]

[Out] (-4*(1 + E^x)^(3/4))/3 + (4*(1 + E^x)^(7/4))/7

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{2x}}{\sqrt[4]{1+e^x}}\,dx &= \text{Subst}\left(\int \frac{x}{\sqrt[4]{1+x}}\,dx, x, e^x\right)\\ &= \text{Subst}\left(\int \left(-\frac{1}{\sqrt[4]{1+x}}+(1+x)^{3/4}\right)\,dx, x, e^x\right)\\ &= -\frac{4}{3}(1+e^x)^{3/4}+\frac{4}{7}(1+e^x)^{7/4}\end{aligned}$$

Mathematica [A]
time = 0.02, size = 22, normalized size = 0.81

$$\frac{4}{21}(1+e^x)^{3/4}(-7+3(1+e^x))$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(2*x)/(1 + E^x)^(1/4),x]
[Out] (4*(1 + E^x)^(3/4)*(-7 + 3*(1 + E^x)))/21
```

Maple [A]
time = 0.02, size = 18, normalized size = 0.67

method	result	size
risch	$\frac{4(-4+3\,e^x)(1+e^x)^{\frac{3}{4}}}{21}$	15
default	$-\frac{4(1+e^x)^{\frac{3}{4}}}{3}+\frac{4(1+e^x)^{\frac{7}{4}}}{7}$	18

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(1+exp(x))^(1/4),x,method=_RETURNVERBOSE)
[Out] -4/3*(1+exp(x))^(3/4)+4/7*(1+exp(x))^(7/4)
```

Maxima [A]
time = 0.31, size = 17, normalized size = 0.63

$$\frac{4}{7}\left(e^x+1\right)^{\frac{7}{4}}-\frac{4}{3}\left(e^x+1\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(x))^(1/4),x, algorithm="maxima")
[Out] 4/7*(e^x + 1)^(7/4) - 4/3*(e^x + 1)^(3/4)
```

Fricas [A]
time = 0.41, size = 14, normalized size = 0.52

$$\frac{4}{21}\left(3\,e^x-4\right)\left(e^x+1\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(x))^(1/4),x, algorithm="fricas")
[Out] 4/21*(3*e^x - 4)*(e^x + 1)^(3/4)
```

Sympy [A]
time = 1.14, size = 22, normalized size = 0.81

$$\frac{4(e^x+1)^{\frac{7}{4}}}{7}-\frac{4(e^x+1)^{\frac{3}{4}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(x))**(1/4),x)
[Out] 4*(exp(x) + 1)**(7/4)/7 - 4*(exp(x) + 1)**(3/4)/3
```

Giac [A]
time = 4.71, size = 17, normalized size = 0.63

$$\frac{4}{7}(e^x+1)^{\frac{7}{4}}-\frac{4}{3}(e^x+1)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(x))^(1/4),x, algorithm="giac")
[Out] 4/7*(e^x + 1)^(7/4) - 4/3*(e^x + 1)^(3/4)
```

Mupad [B]
time = 3.54, size = 14, normalized size = 0.52

$$\frac{4\,(\mathrm{e}^x+1)^{3/4}\,(3\,\mathrm{e}^x-4)}{21}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(exp(x) + 1)^(1/4),x)
[Out] (4*(exp(x) + 1)^(3/4)*(3*exp(x) - 4))/21
```

3.689 $\int \frac{-e^x+2e^{2x}}{\sqrt{-1-6e^x+3e^{2x}}}\,dx$

Optimal. Leaf size=62

$$\frac{2}{3}\sqrt{-1-6e^x+3e^{2x}}-\frac{\tanh^{-1}\left(\frac{\sqrt{3}\,(1-e^x)}{\sqrt{-1-6e^x+3e^{2x}}}\right)}{\sqrt{3}}$$

```
[Out] -1/3*arctanh((1-exp(x))*3^(1/2)/(-1-6*exp(x)+3*exp(2*x))^(1/2))*3^(1/2)+2/3
*(-1-6*exp(x)+3*exp(2*x))^(1/2)
```

Rubi [A]
time = 0.04, antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {2320, 654, 635, 212}

$$\frac{2}{3}\sqrt{-6e^x+3e^{2x}-1}-\frac{\tanh^{-1}\left(\frac{\sqrt{3}\,(1-e^x)}{\sqrt{-6e^x+3e^{2x}-1}}\right)}{\sqrt{3}}$$

Antiderivative was successfully verified.

```
[In] Int[(-E^x + 2*E^(2*x))/Sqrt[-1 - 6*E^x + 3*E^(2*x)],x]
```

```
[Out] (2*Sqrt[-1 - 6*E^x + 3*E^(2*x)])/3 - ArcTanh[(Sqrt[3]*(1 - E^x))/Sqrt[-1 -
6*E^x + 3*E^(2*x)]]/Sqrt[3]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 635

```
Int[1/Sqrt[(a_) + (b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Dist[2, Subst[In
t[1/(4*c - x^2), x], x, (b + 2*c*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a,
 b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 654

```
Int[((d_.) + (e_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol
] :> Simp[e*((a + b*x + c*x^2)^(p + 1)/(2*c*(p + 1))), x] + Dist[(2*c*d - b
*e)/(2*c), Int[(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x]
&& NeQ[2*c*d - b*e, 0] && NeQ[p, -1]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{-e^x+2e^{2x}}{\sqrt{-1-6e^x+3e^{2x}}}\,dx &= \text{Subst}\left(\int \frac{-1+2x}{\sqrt{-1-6x+3x^2}}\,dx,x,e^x\right)\\ &= \frac{2}{3}\sqrt{-1-6e^x+3e^{2x}}+\text{Subst}\left(\int \frac{1}{\sqrt{-1-6x+3x^2}}\,dx,x,e^x\right)\\ &= \frac{2}{3}\sqrt{-1-6e^x+3e^{2x}}+2\text{Subst}\left(\int \frac{1}{12-x^2}\,dx,x,\frac{-6+6e^x}{\sqrt{-1-6e^x+3e^{2x}}}\right)\\ &= \frac{2}{3}\sqrt{-1-6e^x+3e^{2x}}-\frac{\tanh^{-1}\left(\frac{\sqrt{3}\,(1-e^x)}{\sqrt{-1-6e^x+3e^{2x}}}\right)}{\sqrt{3}}\end{aligned}$$

Mathematica [A]
time = 0.13, size = 56, normalized size = 0.90

$$\frac{2}{3}\sqrt{-1-6e^x+3e^{2x}}-\frac{\log\left(3-3e^x+\sqrt{-3-18e^x+9e^{2x}}\right)}{\sqrt{3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(-E^x + 2*E^(2*x))/Sqrt[-1 - 6*E^x + 3*E^(2*x)],x]
[Out] (2*Sqrt[-1 - 6*E^x + 3*E^(2*x)])/3 - Log[3 - 3*E^x + Sqrt[-3 - 18*E^x + 9*E
^(2*x)]]/Sqrt[3]
```

Maple [A]
time = 0.03, size = 50, normalized size = 0.81

method	result	size
default	$\frac{\ln\left(\frac{(-3+3\,e^x)\sqrt{3}}{3}+\sqrt{-1-6\,e^x+3\,e^{2x}}\right)\sqrt{3}}{3}+\frac{2\sqrt{-1-6\,e^x+3\,e^{2x}}}{3}$	50

risch	$\frac{\ln\left(\frac{(-3+3\,\mathrm{e}^{x})\sqrt{3}}{3}+\sqrt{-1-6\,\mathrm{e}^{x}+3\,\mathrm{e}^{2x}}\right)\sqrt{3}}{3}+\frac{2\sqrt{-1-6\,\mathrm{e}^{x}+3\,\mathrm{e}^{2x}}}{3}$	50

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-exp(x)+2*exp(2*x))/(-1-6*exp(x)+3*exp(2*x))^(1/2),x,method=_RETURNVER
BOSE)
```

```
[Out] 1/3*ln(1/3*(-3+3*exp(x))*3^(1/2)+(-1-6*exp(x)+3*exp(x)^2)^(1/2))*3^(1/2)+2/
3*(-1-6*exp(x)+3*exp(x)^2)^(1/2)
```

Maxima [A]
time = 0.50, size = 48, normalized size = 0.77

$$\frac{1}{3}\,\sqrt{3}\,\log\left(2\,\sqrt{3}\,\sqrt{3\,e^{(2\,x)}-6\,e^{x}-1}+6\,e^{x}-6\right)+\frac{2}{3}\,\sqrt{3\,e^{(2\,x)}-6\,e^{x}-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-exp(x)+2*exp(2*x))/(-1-6*exp(x)+3*exp(2*x))^(1/2),x, algorithm=
"maxima")
```

```
[Out] 1/3*sqrt(3)*log(2*sqrt(3)*sqrt(3*e^(2*x) - 6*e^x - 1) + 6*e^x - 6) + 2/3*sq
rt(3*e^(2*x) - 6*e^x - 1)
```

Fricas [A]
time = 0.44, size = 62, normalized size = 1.00

$$\frac{1}{6}\,\sqrt{3}\,\log\left(\left(\sqrt{3}\,e^{x}-\sqrt{3}\right)\sqrt{3\,e^{(2\,x)}-6\,e^{x}-1}+3\,e^{(2\,x)}-6\,e^{x}+1\right)+\frac{2}{3}\,\sqrt{3\,e^{(2\,x)}-6\,e^{x}-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-exp(x)+2*exp(2*x))/(-1-6*exp(x)+3*exp(2*x))^(1/2),x, algorithm=
"fricas")
```

```
[Out] 1/6*sqrt(3)*log((sqrt(3)*e^x - sqrt(3))*sqrt(3*e^(2*x) - 6*e^x - 1) + 3*e^(
2*x) - 6*e^x + 1) + 2/3*sqrt(3*e^(2*x) - 6*e^x - 1)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{(2e^{x}-1)\,e^{x}}{\sqrt{3e^{2x}-6e^{x}-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-exp(x)+2*exp(2*x))/(-1-6*exp(x)+3*exp(2*x))**(1/2),x)
```

```
[Out] Integral((2*exp(x) - 1)*exp(x)/sqrt(3*exp(2*x) - 6*exp(x) - 1), x)
```

Giac [A]
time = 5.70, size = 49, normalized size = 0.79

$$-\frac{1}{3}\sqrt{3}\log\left(\left|-\sqrt{3}e^{x}+\sqrt{3}+\sqrt{3e^{(2x)}-6e^{x}-1}\right|\right)+\frac{2}{3}\sqrt{3e^{(2x)}-6e^{x}-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-exp(x)+2*exp(2*x))/(-1-6*exp(x)+3*exp(2*x))^(1/2),x, algorithm=
"giac")
```

```
[Out] -1/3*sqrt(3)*log(abs(-sqrt(3)*e^x + sqrt(3) + sqrt(3*e^(2*x) - 6*e^x - 1)))
 + 2/3*sqrt(3*e^(2*x) - 6*e^x - 1)
```

Mupad [B]
time = 4.20, size = 49, normalized size = 0.79

$$\frac{\sqrt{3}\,\ln\left(\sqrt{3\,\mathrm{e}^{2\,x}-6\,\mathrm{e}^{x}-1}-\sqrt{3}+\sqrt{3}\,\mathrm{e}^{x}\right)}{3}+\frac{2\,\sqrt{3\,\mathrm{e}^{2\,x}-6\,\mathrm{e}^{x}-1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((2*exp(2*x) - exp(x))/(3*exp(2*x) - 6*exp(x) - 1)^(1/2),x)
```

```
[Out] (3^(1/2)*log((3*exp(2*x) - 6*exp(x) - 1)^(1/2) - 3^(1/2) + 3^(1/2)*exp(x)))
/3 + (2*(3*exp(2*x) - 6*exp(x) - 1)^(1/2))/3
```

3.690 $\int e^x(-5x+x^2)\,dx$

Optimal. Leaf size=19

$$7e^x - 7e^x x + e^x x^2$$

[Out] 7*exp(x)-7*exp(x)*x+exp(x)*x^2

Rubi [A]
time = 0.03, antiderivative size = 19, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 4, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.364$, Rules used = {1607, 2227, 2207, 2225}

$$e^x x^2 - 7e^x x + 7e^x$$

Antiderivative was successfully verified.

[In] Int[E^x*(-5*x + x^2),x]

[Out] 7*E^x - 7*E^x*x + E^x*x^2

Rule 1607

```
Int[(u_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.))^(n_.), x_Symbol] :> Int[u*x
^(n*p)*(a + b*x^(q - p))^n, x] /; FreeQ[{a, b, p, q}, x] && IntegerQ[n] &&
PosQ[q - p]
```

Rule 2207

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[(c + d*x)^m*((b*F^(g*(e + f*x)))^n/(f*g*n*Log[F])),
x] - Dist[d*(m/(f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !TrueQ[$UseGamma]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2227

```
Int[(F_)^((c_.)*(v_))*(u_), x_Symbol] :> Int[ExpandIntegrand[F^(c*ExpandToS
um[v, x]), u, x], x] /; FreeQ[{F, c}, x] && PolynomialQ[u, x] && LinearQ[v,
 x] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$
\begin{aligned}
\int e^x(-5x+x^2)\,dx &= \int e^x(-5+x)x\,dx \\
&= \int (-5e^x x + e^x x^2)\,dx \\
&= -\left(5\int e^x x\,dx\right) + \int e^x x^2\,dx \\
&= -5e^x x + e^x x^2 - 2\int e^x x\,dx + 5\int e^x\,dx \\
&= 5e^x - 7e^x x + e^x x^2 + 2\int e^x\,dx \\
&= 7e^x - 7e^x x + e^x x^2
\end{aligned}
$$

Mathematica [A]
time = 0.02, size = 12, normalized size = 0.63

$$e^x(7-7x+x^2)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*(-5*x + x^2),x]
```

```
[Out] E^x*(7 - 7*x + x^2)
```

Maple [A]
time = 0.01, size = 17, normalized size = 0.89

method	result	size
gosper	$e^x(x^2-7x+7)$	12
risch	$e^x(x^2-7x+7)$	12
default	$7\,e^x-7\,e^x x+e^x x^2$	17
norman	$7\,e^x-7\,e^x x+e^x x^2$	17
meijerg	$-7+\frac{(3x^2-6x+6)e^x}{3}+\frac{5(2-2x)e^x}{2}$	26

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(x^2-5*x),x,method=_RETURNVERBOSE)
```

```
[Out] 7*exp(x)-7*exp(x)*x+exp(x)*x^2
```

Maxima [A]
time = 0.29, size = 19, normalized size = 1.00

$$(x^2-2\,x+2)e^x-5\,(x-1)e^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(x^2-5*x),x, algorithm="maxima")
```

```
[Out] (x^2 - 2*x + 2)*e^x - 5*(x - 1)*e^x
```

Fricas [A]
time = 0.39, size = 11, normalized size = 0.58

$$\left(x^2 - 7\,x + 7\right)e^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(x^2-5*x),x, algorithm="fricas")
```

```
[Out] (x^2 - 7*x + 7)*e^x
```

Sympy [A]
time = 0.02, size = 10, normalized size = 0.53

$$\left(x^2 - 7x + 7\right)e^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(x**2-5*x),x)
```

```
[Out] (x**2 - 7*x + 7)*exp(x)
```

Giac [A]
time = 4.68, size = 11, normalized size = 0.58

$$\left(x^2 - 7\,x + 7\right)e^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(x^2-5*x),x, algorithm="giac")
```

```
[Out] (x^2 - 7*x + 7)*e^x
```

Mupad [B]
time = 3.46, size = 11, normalized size = 0.58

$$\mathrm{e}^x\,\left(x^2 - 7\,x + 7\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-exp(x)*(5*x - x^2),x)
```

```
[Out] exp(x)*(x^2 - 7*x + 7)
```

3.691 $\int e^{3x}(-x+x^2)\,dx$

Optimal. Leaf size=32

$$\frac{5e^{3x}}{27}-\frac{5}{9}e^{3x}x+\frac{1}{3}e^{3x}x^2$$

[Out] 5/27*exp(3*x)-5/9*exp(3*x)*x+1/3*exp(3*x)*x^2

Rubi [A]
time = 0.03, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}=0.308$, Rules used = {1607, 2227, 2207, 2225}

$$\frac{1}{3}e^{3x}x^2-\frac{5}{9}e^{3x}x+\frac{5e^{3x}}{27}$$

Antiderivative was successfully verified.

[In] Int[E^(3*x)*(-x + x^2),x]

[Out] (5*E^(3*x))/27 - (5*E^(3*x)*x)/9 + (E^(3*x)*x^2)/3

Rule 1607

```
Int[(u_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.))^(n_.), x_Symbol] :> Int[u*x
^(n*p)*(a + b*x^(q - p))^n, x] /; FreeQ[{a, b, p, q}, x] && IntegerQ[n] &&
PosQ[q - p]
```

Rule 2207

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[(c + d*x)^m*((b*F^(g*(e + f*x)))^n/(f*g*n*Log[F])),
x] - Dist[d*(m/(f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !TrueQ[$UseGamma]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2227

```
Int[(F_)^((c_.)*(v_))*(u_), x_Symbol] :> Int[ExpandIntegrand[F^(c*ExpandToS
um[v, x]), u, x], x] /; FreeQ[{F, c}, x] && PolynomialQ[u, x] && LinearQ[v,
 x] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\begin{aligned}
\int e^{3x}(-x+x^2)\,dx &= \int e^{3x}(-1+x)x\,dx \\
&= \int \left(-e^{3x}x+e^{3x}x^2\right)\,dx \\
&= -\int e^{3x}x\,dx+\int e^{3x}x^2\,dx \\
&= -\frac{1}{3}e^{3x}x+\frac{1}{3}e^{3x}x^2+\frac{1}{3}\int e^{3x}\,dx-\frac{2}{3}\int e^{3x}x\,dx \\
&= \frac{e^{3x}}{9}-\frac{5}{9}e^{3x}x+\frac{1}{3}e^{3x}x^2+\frac{2}{9}\int e^{3x}\,dx \\
&= \frac{5e^{3x}}{27}-\frac{5}{9}e^{3x}x+\frac{1}{3}e^{3x}x^2
\end{aligned}$$

Mathematica [A]
time = 0.02, size = 19, normalized size = 0.59

$$\frac{1}{27}e^{3x}\left(5-15x+9x^2\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(3*x)*(-x + x^2),x]
```

```
[Out] (E^(3*x)*(5 - 15*x + 9*x^2))/27
```

Maple [A]
time = 0.02, size = 24, normalized size = 0.75

method	result	size
risch	$\left(\frac{1}{3}x^2-\frac{5}{9}x+\frac{5}{27}\right)e^{3x}$	16
gosper	$\frac{e^{3x}\left(9x^2-15x+5\right)}{27}$	17
derivativedivides	$\frac{5\,e^{3x}}{27}-\frac{5\,e^{3x}x}{9}+\frac{e^{3x}x^2}{3}$	24
default	$\frac{5\,e^{3x}}{27}-\frac{5\,e^{3x}x}{9}+\frac{e^{3x}x^2}{3}$	24
norman	$\frac{5\,e^{3x}}{27}-\frac{5\,e^{3x}x}{9}+\frac{e^{3x}x^2}{3}$	24
meijerg	$-\frac{5}{27}+\frac{\left(27x^2-18x+6\right)e^{3x}}{81}+\frac{(2-6x)e^{3x}}{18}$	30

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(3*x)*(x^2-x),x,method=_RETURNVERBOSE)
```

```
[Out] 5/27*exp(3*x)-5/9*exp(3*x)*x+1/3*exp(3*x)*x^2
```

Maxima [A]
time = 0.28, size = 28, normalized size = 0.88

$$\frac{1}{27}\left(9\,x^2-6\,x+2\right)e^{(3\,x)}-\frac{1}{9}\left(3\,x-1\right)e^{(3\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)*(x^2-x),x, algorithm="maxima")
[Out] 1/27*(9*x^2 - 6*x + 2)*e^(3*x) - 1/9*(3*x - 1)*e^(3*x)
```

Fricas [A]
time = 0.37, size = 16, normalized size = 0.50

$$\frac{1}{27}\left(9\,x^2-15\,x+5\right)e^{(3\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)*(x^2-x),x, algorithm="fricas")
[Out] 1/27*(9*x^2 - 15*x + 5)*e^(3*x)
```

Sympy [A]
time = 0.02, size = 15, normalized size = 0.47

$$\frac{(9x^2-15x+5)\,e^{3x}}{27}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)*(x**2-x),x)
[Out] (9*x**2 - 15*x + 5)*exp(3*x)/27
```

Giac [A]
time = 4.65, size = 16, normalized size = 0.50

$$\frac{1}{27}\left(9\,x^2-15\,x+5\right)e^{(3\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)*(x^2-x),x, algorithm="giac")
[Out] 1/27*(9*x^2 - 15*x + 5)*e^(3*x)
```

Mupad [B]
time = 3.53, size = 16, normalized size = 0.50

$$\frac{\mathrm{e}^{3\,x}\,\left(9\,x^2-15\,x+5\right)}{27}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-exp(3*x)*(x - x^2),x)
[Out] (exp(3*x)*(9*x^2 - 15*x + 5))/27
```

3.692 $\int e^{x^x} x^{2x}(1+\log(x))\,dx$

Optimal. Leaf size=11

$$e^{x^x}(-1+x^x)$$

[Out] exp(x^x)*(-1+x^x)

Rubi [F]
time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int e^{x^x} x^{2x}(1+\log(x))\,dx$$

Verification is not applicable to the result.

[In] Int[E^x^x*x^(2*x)*(1 + Log[x]),x]

[Out] Defer[Int][E^x^x*x^(2*x), x] + Log[x]*Defer[Int][E^x^x*x^(2*x), x] - Defer[Int][Defer[Int][E^x^x*x^(2*x), x]/x, x]

Rubi steps

$$\begin{aligned}\int e^{x^x} x^{2x}(1+\log(x))\,dx &= \int \left(e^{x^x} x^{2x}+e^{x^x} x^{2x}\log(x)\right)\,dx\\ &= \int e^{x^x} x^{2x}\,dx+\int e^{x^x} x^{2x}\log(x)\,dx\\ &= \log(x)\int e^{x^x} x^{2x}\,dx+\int e^{x^x} x^{2x}\,dx-\int \frac{\int e^{x^x} x^{2x}\,dx}{x}\,dx\end{aligned}$$

Mathematica [A]
time = 0.02, size = 11, normalized size = 1.00

$$e^{x^x}(-1+x^x)$$

Antiderivative was successfully verified.

[In] Integrate[E^x^x*x^(2*x)*(1 + Log[x]),x]

[Out] E^x^x*(-1 + x^x)

Maple [A]
time = 0.02, size = 11, normalized size = 1.00

method	result	size
risch	$e^{x^x}(-1+x^x)$	11
norman	$e^{\ln(x)x}e^{e^{\ln(x)x}}-e^{e^{\ln(x)x}}$	22

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^x)*x^(2*x)*(1+ln(x)),x,method=_RETURNVERBOSE)
```

```
[Out] exp(x^x)*(-1+x^x)
```

Maxima [A]
time = 0.36, size = 10, normalized size = 0.91

$$(x^x-1)e^{(x^x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^x)*x^(2*x)*(1+log(x)),x, algorithm="maxima")
```

```
[Out] (x^x - 1)*e^(x^x)
```

Fricas [A]
time = 0.37, size = 10, normalized size = 0.91

$$(x^x-1)e^{(x^x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^x)*x^(2*x)*(1+log(x)),x, algorithm="fricas")
```

```
[Out] (x^x - 1)*e^(x^x)
```

Sympy [A]
time = 0.15, size = 8, normalized size = 0.73

$$(x^x-1)\,e^{x^x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**x)*x**(2*x)*(1+ln(x)),x)
```

```
[Out] (x**x - 1)*exp(x**x)
```

Giac [A]
time = 5.53, size = 10, normalized size = 0.91

$$(x^x-1)e^{(x^x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^x)*x^(2*x)*(1+log(x)),x, algorithm="giac")
```

```
[Out] (x^x - 1)*e^(x^x)
```

Mupad [B]

time = 3.59, size = 10, normalized size = 0.91

$$e^{x^x} (x^x - 1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(2*x)*exp(x^x)*(log(x) + 1),x)
```

```
[Out] exp(x^x)*(x^x - 1)
```

3.693 $\int \frac{e^{5x}+e^{7x}}{e^{-x}+e^x} \, dx$

Optimal. Leaf size=9

$$\frac{e^{6x}}{6}$$

```
[Out] 1/6*exp(6*x)
```

Rubi [A]
time = 0.02, antiderivative size = 9, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.087$, Rules used = {2320, 30}

$$\frac{e^{6x}}{6}$$

Antiderivative was successfully verified.

```
[In] Int[(E^(5*x) + E^(7*x))/(E^(-x) + E^x),x]
```

```
[Out] E^(6*x)/6
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned} \int \frac{e^{5x}+e^{7x}}{e^{-x}+e^x} \, dx &= \text{Subst}\left(\int x^5 \, dx, x, e^x\right) \\ &= \frac{e^{6x}}{6} \end{aligned}$$

Mathematica [A]
time = 0.00, size = 9, normalized size = 1.00

$$\frac{e^{6x}}{6}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(5*x) + E^(7*x))/(E^(-x) + E^x),x]
```

```
[Out] E^(6*x)/6
```

Maple [A]
time = 0.02, size = 7, normalized size = 0.78

method	result	size
default	$\frac{e^{6x}}{6}$	7
norman	$\frac{e^{6x}}{6}$	7
risch	$\frac{e^{6x}}{6}$	7

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(5*x)+exp(7*x))/(exp(-x)+exp(x)),x,method=_RETURNVERBOSE)
```

```
[Out] 1/6*exp(x)^6
```

Maxima [A]
time = 0.28, size = 6, normalized size = 0.67

$$\frac{1}{6}\,e^{(6\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(5*x)+exp(7*x))/(exp(-x)+exp(x)),x, algorithm="maxima")
```

```
[Out] 1/6*e^(6*x)
```

Fricas [A]
time = 0.37, size = 6, normalized size = 0.67

$$\frac{1}{6}\,e^{(6\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(5*x)+exp(7*x))/(exp(-x)+exp(x)),x, algorithm="fricas")
```

```
[Out] 1/6*e^(6*x)
```

Sympy [A]
time = 0.03, size = 5, normalized size = 0.56

$$\frac{e^{6x}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(5*x)+exp(7*x))/(exp(-x)+exp(x)),x)
[Out] exp(6*x)/6
```

Giac [A]
time = 2.19, size = 6, normalized size = 0.67

$$\frac{1}{6}\,e^{(6\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(5*x)+exp(7*x))/(exp(-x)+exp(x)),x, algorithm="giac")
[Out] 1/6*e^(6*x)
```

Mupad [B]
time = 0.04, size = 6, normalized size = 0.67

$$\frac{\mathrm{e}^{6\,x}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(5*x) + exp(7*x))/(exp(-x) + exp(x)),x)
[Out] exp(6*x)/6
```

3.694 $\int x^{-2-\frac{1}{x}}(1-\log(x))\,dx$

Optimal. Leaf size=9

$$-x^{-1/x}$$

```
[Out] -1/(x^(1/x))
```

Rubi [F]
time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int x^{-2-\frac{1}{x}}(1-\log(x))\,dx$$

Verification is not applicable to the result.

```
[In] Int[x^(-2 - x^(-1))*(1 - Log[x]),x]
[Out] Defer[Int][x^(-2 - x^(-1)), x] - Log[x]*Defer[Int][x^(-2 - x^(-1)), x] + De
fer[Int][Defer[Int][x^(-2 - x^(-1)), x]/x, x]
```

Rubi steps

$$\begin{aligned}\int x^{-2-\frac{1}{x}}(1-\log(x))\,dx &= \int \left(x^{-2-\frac{1}{x}} - x^{-2-\frac{1}{x}}\log(x)\right)\,dx\\ &= \int x^{-2-\frac{1}{x}}\,dx - \int x^{-2-\frac{1}{x}}\log(x)\,dx\\ &= -\left(\log(x)\int x^{-2-\frac{1}{x}}\,dx\right) + \int x^{-2-\frac{1}{x}}\,dx + \int \frac{\int x^{-2-\frac{1}{x}}\,dx}{x}\,dx\end{aligned}$$

Mathematica [A]
time = 0.01, size = 9, normalized size = 1.00

$$-x^{-1/x}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-2 - x^(-1))*(1 - Log[x]),x]
[Out] -x^(-x^(-1))
```

Maple [A]
time = 0.01, size = 18, normalized size = 2.00

method	result	size
risch	$-x^2 x^{-\frac{2x+1}{x}}$	18

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-2-1/x)*(1-ln(x)),x,method=_RETURNVERBOSE)
```

```
[Out] -x^2*x^(-(2*x+1)/x)
```

Maxima [A]
time = 0.33, size = 9, normalized size = 1.00

$$-\frac{1}{x^{\left(\frac{1}{x}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-2-1/x)*(1-log(x)),x, algorithm="maxima")
```

```
[Out] -1/x^(1/x)
```

Fricas [A]
time = 0.35, size = 18, normalized size = 2.00

$$-\frac{x^2}{x^{\frac{2x+1}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-2-1/x)*(1-log(x)),x, algorithm="fricas")
```

```
[Out] -x^2/x^((2*x + 1)/x)
```

Sympy [A]
time = 0.06, size = 12, normalized size = 1.33

$$-x^2 x^{-2-\frac{1}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**(-2-1/x)*(1-ln(x)),x)
```

```
[Out] -x**2*x**(-2 - 1/x)
```

Giac [A]
time = 2.70, size = 16, normalized size = 1.78

$$-xe^{\left(-\frac{x\log(x)+\log(x)}{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-2-1/x)*(1-log(x)),x, algorithm="giac")
```

```
[Out] -x*e^(-(x*log(x) + log(x))/x)
```

Mupad [B]
time = 3.58, size = 9, normalized size = 1.00

$$-\frac{1}{x^{1/x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(log(x) - 1)/x^(1/x + 2),x)
```

```
[Out] -1/x^(1/x)
```

3.695 $\int (a+be^x)^2 \, dx$

Optimal. Leaf size=25

$$2abe^x+\frac{1}{2}b^2e^{2x}+a^2x$$

[Out] 2*a*b*exp(x)+1/2*b^2*exp(2*x)+a^2*x

Rubi [A]

time = 0.01, antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {2320, 45}

$$a^2x+2abe^x+\frac{1}{2}b^2e^{2x}$$

Antiderivative was successfully verified.

[In] Int[(a + b*E^x)^2,x]

[Out] 2*a*b*E^x + (b^2*E^(2*x))/2 + a^2*x

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int (a+be^x)^2 \, dx &= \text{Subst}\left(\int \frac{(a+bx)^2}{x} \, dx, x, e^x\right)\\ &= \text{Subst}\left(\int \left(2ab+\frac{a^2}{x}+b^2x\right) \, dx, x, e^x\right)\\ &= 2abe^x+\frac{1}{2}b^2e^{2x}+a^2x\end{aligned}$$

Mathematica [A]
time = 0.02, size = 26, normalized size = 1.04

$$\frac{1}{2}be^x(4a+be^x)+a^2\log\left(e^x\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*E^x)^2,x]
[Out] (b*E^x*(4*a + b*E^x))/2 + a^2*Log[E^x]
```

Maple [A]
time = 0.01, size = 24, normalized size = 0.96

method	result	size
norman	$2ab\,\mathrm{e}^x+\frac{b^2\mathrm{e}^{2x}}{2}+a^2x$	22
risch	$2ab\,\mathrm{e}^x+\frac{b^2\mathrm{e}^{2x}}{2}+a^2x$	22
derivativedivides	$\frac{b^2\mathrm{e}^{2x}}{2}+2ab\,\mathrm{e}^x+a^2\ln\left(\mathrm{e}^x\right)$	24
default	$\frac{b^2\mathrm{e}^{2x}}{2}+2ab\,\mathrm{e}^x+a^2\ln\left(\mathrm{e}^x\right)$	24

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*exp(x))^2,x,method=_RETURNVERBOSE)
[Out] 1/2*b^2*exp(x)^2+2*a*b*exp(x)+a^2*ln(exp(x))
```

Maxima [A]
time = 0.27, size = 21, normalized size = 0.84

$$a^2x+\frac{1}{2}\,b^2e^{(2\,x)}+2\,abe^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(x))^2,x, algorithm="maxima")
[Out] a^2*x + 1/2*b^2*e^(2*x) + 2*a*b*e^x
```

Fricas [A]
time = 0.34, size = 21, normalized size = 0.84

$$a^2x+\frac{1}{2}\,b^2e^{(2\,x)}+2\,abe^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(x))^2,x, algorithm="fricas")
```

```
[Out] a^2*x + 1/2*b^2*e^(2*x) + 2*a*b*e^x
```

Sympy [A]
time = 0.04, size = 22, normalized size = 0.88

$$a^2x + 2abe^x + \frac{b^2e^{2x}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(x))**2,x)
```

```
[Out] a**2*x + 2*a*b*exp(x) + b**2*exp(2*x)/2
```

Giac [A]
time = 4.92, size = 21, normalized size = 0.84

$$a^2x + \frac{1}{2}\,b^2e^{(2\,x)} + 2\,abe^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(x))^2,x, algorithm="giac")
```

```
[Out] a^2*x + 1/2*b^2*e^(2*x) + 2*a*b*e^x
```

Mupad [B]
time = 3.55, size = 21, normalized size = 0.84

$$x\,a^2 + 2\,\mathrm{e}^x\,a\,b + \frac{\mathrm{e}^{2\,x}\,b^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*exp(x))^2,x)
```

```
[Out] (b^2*exp(2*x))/2 + a^2*x + 2*a*b*exp(x)
```

3.696 $\int (a+be^x)^3 \, dx$

Optimal. Leaf size=40

$$3a^2be^x+\frac{3}{2}ab^2e^{2x}+\frac{1}{3}b^3e^{3x}+a^3x$$

```
[Out] 3*a^2*b*exp(x)+3/2*a*b^2*exp(2*x)+1/3*b^3*exp(3*x)+a^3*x
```

Rubi [A]
time = 0.01, antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {2320, 45}

$$a^3x+3a^2be^x+\frac{3}{2}ab^2e^{2x}+\frac{1}{3}b^3e^{3x}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*E^x)^3,x]
```

```
[Out] 3*a^2*b*E^x + (3*a*b^2*E^(2*x))/2 + (b^3*E^(3*x))/3 + a^3*x
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}
\int (a+be^x)^3 \, dx &= \text{Subst}\left(\int \frac{(a+bx)^3}{x} \, dx, x, e^x\right)\\
&= \text{Subst}\left(\int \left(3a^2b+\frac{a^3}{x}+3ab^2x+b^3x^2\right) \, dx, x, e^x\right)\\
&= 3a^2be^x+\frac{3}{2}ab^2e^{2x}+\frac{1}{3}b^3e^{3x}+a^3x
\end{aligned}$$

Mathematica [A]
time = 0.02, size = 40, normalized size = 1.00

$$\frac{1}{6}be^x(18a^2 + 9abe^x + 2b^2e^{2x}) + a^3\log(e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*E^x)^3,x]
[Out] (b*E^x*(18*a^2 + 9*a*b*E^x + 2*b^2*E^(2*x)))/6 + a^3*Log[E^x]
```

Maple [A]
time = 0.02, size = 36, normalized size = 0.90

method	result	size
norman	$3a^2b\,e^x + \frac{3a\,b^2e^{2x}}{2} + \frac{b^3e^{3x}}{3} + a^3x$	34
risch	$3a^2b\,e^x + \frac{3a\,b^2e^{2x}}{2} + \frac{b^3e^{3x}}{3} + a^3x$	34
derivativedivides	$\frac{b^3e^{3x}}{3} + \frac{3a\,b^2e^{2x}}{2} + 3a^2b\,e^x + a^3\ln(e^x)$	36
default	$\frac{b^3e^{3x}}{3} + \frac{3a\,b^2e^{2x}}{2} + 3a^2b\,e^x + a^3\ln(e^x)$	36

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*exp(x))^3,x,method=_RETURNVERBOSE)
[Out] 1/3*b^3*exp(x)^3+3/2*a*b^2*exp(x)^2+3*a^2*b*exp(x)+a^3*ln(exp(x))
```

Maxima [A]
time = 0.30, size = 33, normalized size = 0.82

$$a^3x + \frac{1}{3}\,b^3e^{(3\,x)} + \frac{3}{2}\,ab^2e^{(2\,x)} + 3\,a^2be^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(x))^3,x, algorithm="maxima")
[Out] a^3*x + 1/3*b^3*e^(3*x) + 3/2*a*b^2*e^(2*x) + 3*a^2*b*e^x
```

Fricas [A]
time = 0.35, size = 33, normalized size = 0.82

$$a^3x + \frac{1}{3}\,b^3e^{(3\,x)} + \frac{3}{2}\,ab^2e^{(2\,x)} + 3\,a^2be^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(x))^3,x, algorithm="fricas")
```

```
[Out] a^3*x + 1/3*b^3*e^(3*x) + 3/2*a*b^2*e^(2*x) + 3*a^2*b*e^x
```

Sympy [A]
time = 0.05, size = 37, normalized size = 0.92

$$a^3x + 3a^2be^x + \frac{3ab^2e^{2x}}{2} + \frac{b^3e^{3x}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(x))**3,x)
[Out] a**3*x + 3*a**2*b*exp(x) + 3*a*b**2*exp(2*x)/2 + b**3*exp(3*x)/3
```

Giac [A]
time = 5.83, size = 33, normalized size = 0.82

$$a^3x + \frac{1}{3}\,b^3e^{(3\,x)} + \frac{3}{2}\,ab^2e^{(2\,x)} + 3\,a^2be^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(x))^3,x, algorithm="giac")
[Out] a^3*x + 1/3*b^3*e^(3*x) + 3/2*a*b^2*e^(2*x) + 3*a^2*b*e^x
```

Mupad [B]
time = 0.07, size = 33, normalized size = 0.82

$$x\,a^3 + 3\,\mathrm{e}^x\,a^2\,b + \frac{3\,\mathrm{e}^{2\,x}\,a\,b^2}{2} + \frac{\mathrm{e}^{3\,x}\,b^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*exp(x))^3,x)
[Out] (b^3*exp(3*x))/3 + a^3*x + 3*a^2*b*exp(x) + (3*a*b^2*exp(2*x))/2
```

3.697 $\int (a+be^x)^4\,dx$

Optimal. Leaf size=53

$$4a^3be^x+3a^2b^2e^{2x}+\frac{4}{3}ab^3e^{3x}+\frac{1}{4}b^4e^{4x}+a^4x$$

```
[Out] 4*a^3*b*exp(x)+3*a^2*b^2*exp(2*x)+4/3*a*b^3*exp(3*x)+1/4*b^4*exp(4*x)+a^4*x
```

Rubi [A]
time = 0.02, antiderivative size = 53, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {2320, 45}

$$a^4x+4a^3be^x+3a^2b^2e^{2x}+\frac{4}{3}ab^3e^{3x}+\frac{1}{4}b^4e^{4x}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*E^x)^4,x]
```

```
[Out] 4*a^3*b*E^x + 3*a^2*b^2*E^(2*x) + (4*a*b^3*E^(3*x))/3 + (b^4*E^(4*x))/4 + a
^4*x
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int (a+be^x)^4\,dx &= \text{Subst}\left(\int \frac{(a+bx)^4}{x}\,dx,x,e^x\right)\\ &= \text{Subst}\left(\int \left(4a^3b+\frac{a^4}{x}+6a^2b^2x+4ab^3x^2+b^4x^3\right)\,dx,x,e^x\right)\\ &= 4a^3be^x+3a^2b^2e^{2x}+\frac{4}{3}ab^3e^{3x}+\frac{1}{4}b^4e^{4x}+a^4x\end{aligned}$$

Mathematica [A]
time = 0.02, size = 53, normalized size = 1.00

$$\frac{1}{12}be^x\left(48a^3+36a^2be^x+16ab^2e^{2x}+3b^3e^{3x}\right)+a^4\log\left(e^x\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*E^x)^4,x]
```

```
[Out] (b*E^x*(48*a^3 + 36*a^2*b*E^x + 16*a*b^2*E^(2*x) + 3*b^3*E^(3*x)))/12 + a^4
*Log[E^x]
```

Maple [A]
time = 0.02, size = 48, normalized size = 0.91

method	result	size
norman	$4a^3b\,\mathrm{e}^x+3a^2b^2\mathrm{e}^{2x}+\frac{4a\,b^3\mathrm{e}^{3x}}{3}+\frac{b^4\mathrm{e}^{4x}}{4}+a^4x$	46
risch	$4a^3b\,\mathrm{e}^x+3a^2b^2\mathrm{e}^{2x}+\frac{4a\,b^3\mathrm{e}^{3x}}{3}+\frac{b^4\mathrm{e}^{4x}}{4}+a^4x$	46
derivativedivides	$\frac{b^4\mathrm{e}^{4x}}{4}+\frac{4a\,b^3\mathrm{e}^{3x}}{3}+3a^2b^2\mathrm{e}^{2x}+4a^3b\,\mathrm{e}^x+a^4\ln\left(\mathrm{e}^x\right)$	48
default	$\frac{b^4\mathrm{e}^{4x}}{4}+\frac{4a\,b^3\mathrm{e}^{3x}}{3}+3a^2b^2\mathrm{e}^{2x}+4a^3b\,\mathrm{e}^x+a^4\ln\left(\mathrm{e}^x\right)$	48

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*exp(x))^4,x,method=_RETURNVERBOSE)
```

```
[Out] 1/4*b^4*exp(x)^4+4/3*a*b^3*exp(x)^3+3*a^2*b^2*exp(x)^2+4*a^3*b*exp(x)+a^4*l
n(exp(x))
```

Maxima [A]
time = 0.29, size = 45, normalized size = 0.85

$$a^4x+\frac{1}{4}\,b^4e^{(4\,x)}+\frac{4}{3}\,ab^3e^{(3\,x)}+3\,a^2b^2e^{(2\,x)}+4\,a^3be^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(x))^4,x, algorithm="maxima")
```

```
[Out] a^4*x + 1/4*b^4*e^(4*x) + 4/3*a*b^3*e^(3*x) + 3*a^2*b^2*e^(2*x) + 4*a^3*b*e
^x
```

Fricas [A]
time = 0.35, size = 45, normalized size = 0.85

$$a^4x+\frac{1}{4}\,b^4e^{(4\,x)}+\frac{4}{3}\,ab^3e^{(3\,x)}+3\,a^2b^2e^{(2\,x)}+4\,a^3be^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(x))^4,x, algorithm="fricas")
```

```
[Out] a^4*x + 1/4*b^4*e^(4*x) + 4/3*a*b^3*e^(3*x) + 3*a^2*b^2*e^(2*x) + 4*a^3*b*e
^x
```

Sympy [A]
time = 0.06, size = 51, normalized size = 0.96

$$a^4x + 4a^3be^x + 3a^2b^2e^{2x} + \frac{4ab^3e^{3x}}{3} + \frac{b^4e^{4x}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(x))**4,x)
```

```
[Out] a**4*x + 4*a**3*b*exp(x) + 3*a**2*b**2*exp(2*x) + 4*a*b**3*exp(3*x)/3 + b**
4*exp(4*x)/4
```

Giac [A]
time = 6.31, size = 45, normalized size = 0.85

$$a^4x + \frac{1}{4}b^4e^{(4x)} + \frac{4}{3}ab^3e^{(3x)} + 3a^2b^2e^{(2x)} + 4a^3be^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(x))^4,x, algorithm="giac")
```

```
[Out] a^4*x + 1/4*b^4*e^(4*x) + 4/3*a*b^3*e^(3*x) + 3*a^2*b^2*e^(2*x) + 4*a^3*b*e
^x
```

Mupad [B]
time = 3.43, size = 45, normalized size = 0.85

$$x\,a^4 + 4\,\mathrm{e}^x\,a^3\,b + 3\,\mathrm{e}^{2\,x}\,a^2\,b^2 + \frac{4\,\mathrm{e}^{3\,x}\,a\,b^3}{3} + \frac{\mathrm{e}^{4\,x}\,b^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*exp(x))^4,x)
```

```
[Out] (b^4*exp(4*x))/4 + a^4*x + 3*a^2*b^2*exp(2*x) + 4*a^3*b*exp(x) + (4*a*b^3*e
xp(3*x))/3
```

3.698 $\int \frac{1}{\sqrt{a+be^{c+dx}}}\,dx$

Optimal. Leaf size=32

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{a+be^{c+dx}}}{\sqrt{a}}\right)}{\sqrt{a}\,d}$$

```
[Out] -2*arctanh((a+b*exp(d*x+c))^(1/2)/a^(1/2))/d/a^(1/2)
```

Rubi [A]

time = 0.02, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2320, 65, 214}

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{a+be^{c+dx}}}{\sqrt{a}}\right)}{\sqrt{a}\,d}$$

Antiderivative was successfully verified.

```
[In] Int[1/Sqrt[a + b*E^(c + d*x)],x]
```

```
[Out] (-2*ArcTanh[Sqrt[a + b*E^(c + d*x)]/Sqrt[a]])/(Sqrt[a]*d)
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{1}{\sqrt{a+be^{c+dx}}}\,dx = \frac{\text{Subst}\left(\int \frac{1}{x\sqrt{a+bx}}\,dx, x, e^{c+dx}\right)}{d}$$
$$= \frac{2\text{Subst}\left(\int \frac{1}{-\frac{a}{b}+\frac{x^2}{b}}\,dx, x, \sqrt{a+be^{c+dx}}\right)}{bd}$$
$$= -\frac{2\tanh^{-1}\left(\frac{\sqrt{a+be^{c+dx}}}{\sqrt{a}}\right)}{\sqrt{a}\,d}$$

Mathematica [A]
time = 0.03, size = 32, normalized size = 1.00

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{a+be^{c+dx}}}{\sqrt{a}}\right)}{\sqrt{a}\,d}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/Sqrt[a + b*E^(c + d*x)],x]
[Out] (-2*ArcTanh[Sqrt[a + b*E^(c + d*x)]/Sqrt[a]])/(Sqrt[a]*d)
```

Maple [A]
time = 0.03, size = 26, normalized size = 0.81

method	result	size
derivativedivides	$-\frac{2\,\mathrm{arctanh}\left(\frac{\sqrt{a+b\,\mathrm{e}^{dx+c}}}{\sqrt{a}}\right)}{d\sqrt{a}}$	26
default	$-\frac{2\,\mathrm{arctanh}\left(\frac{\sqrt{a+b\,\mathrm{e}^{dx+c}}}{\sqrt{a}}\right)}{d\sqrt{a}}$	26

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*exp(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
[Out] -2*arctanh((a+b*exp(d*x+c))^(1/2)/a^(1/2))/d/a^(1/2)
```

Maxima [A]
time = 0.51, size = 45, normalized size = 1.41

$$\frac{\log\left(\frac{\sqrt{be^{(dx+c)}+a}-\sqrt{a}}{\sqrt{be^{(dx+c)}+a}+\sqrt{a}}\right)}{\sqrt{a}\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*exp(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] log((sqrt(b*e^(d*x + c) + a) - sqrt(a))/(sqrt(b*e^(d*x + c) + a) + sqrt(a))
)/(sqrt(a)*d)
```

Fricas [**A**]
time = 0.38, size = 83, normalized size = 2.59

$$\left[\frac{\log\left(\left(be^{(dx+c)} - 2\sqrt{be^{(dx+c)} + a}\sqrt{a} + 2a\right)e^{(-dx-c)}\right)}{\sqrt{a}d}, \frac{2\sqrt{-a}\arctan\left(\frac{\sqrt{be^{(dx+c)}+a}\sqrt{-a}}{a}\right)}{ad}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*exp(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] [log((b*e^(d*x + c) - 2*sqrt(b*e^(d*x + c) + a)*sqrt(a) + 2*a)*e^(-d*x - c)
)/(sqrt(a)*d), 2*sqrt(-a)*arctan(sqrt(b*e^(d*x + c) + a)*sqrt(-a)/a)/(a*d)]
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{a + be^{c+dx}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*exp(d*x+c))**(1/2),x)
```

```
[Out] Integral(1/sqrt(a + b*exp(c + d*x)), x)
```

Giac [**A**]
time = 5.73, size = 29, normalized size = 0.91

$$\frac{2\arctan\left(\frac{\sqrt{be^{(dx+c)}+a}}{\sqrt{-a}}\right)}{\sqrt{-a}\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*exp(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] 2*arctan(sqrt(b*e^(d*x + c) + a)/sqrt(-a))/(sqrt(-a)*d)
```

Mupad [**B**]
time = 3.62, size = 25, normalized size = 0.78

$$-\frac{2\,\mathrm{atanh}\left(\frac{\sqrt{a+b\,e^{d\,x}\,e^{c}}}{\sqrt{a}}\right)}{\sqrt{a}\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a + b*exp(c + d*x))^(1/2),x)
[Out] -(2*atanh((a + b*exp(d*x)*exp(c))^(1/2)/a^(1/2)))/(a^(1/2)*d)
```

3.699 $\int \frac{1}{\sqrt{-a+be^{c+dx}}}\,dx$

Optimal. Leaf size=34

$$\frac{2\tan^{-1}\left(\frac{\sqrt{-a+be^{c+dx}}}{\sqrt{a}}\right)}{\sqrt{a}\,d}$$

```
[Out] 2*arctan((-a+b*exp(d*x+c))^(1/2)/a^(1/2))/d/a^(1/2)
```

Rubi [A]

time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.176$, Rules used = {2320, 65, 211}

$$\frac{2\text{ArcTan}\left(\frac{\sqrt{be^{c+dx}-a}}{\sqrt{a}}\right)}{\sqrt{a}\,d}$$

Antiderivative was successfully verified.

```
[In] Int[1/Sqrt[-a + b*E^(c + d*x)],x]
```

```
[Out] (2*ArcTan[Sqrt[-a + b*E^(c + d*x)]/Sqrt[a]])/(Sqrt[a]*d)
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{1}{\sqrt{-a+be^{c+dx}}}\,dx = \frac{\text{Subst}\left(\int \frac{1}{x\sqrt{-a+bx}}\,dx, x, e^{c+dx}\right)}{d}$$
$$= \frac{2\text{Subst}\left(\int \frac{1}{\frac{a}{b}+\frac{x^2}{b}}\,dx, x, \sqrt{-a+be^{c+dx}}\right)}{bd}$$
$$= \frac{2\tan^{-1}\left(\frac{\sqrt{-a+be^{c+dx}}}{\sqrt{a}}\right)}{\sqrt{a}\,d}$$

Mathematica [A]
time = 0.03, size = 34, normalized size = 1.00

$$\frac{2\tan^{-1}\left(\frac{\sqrt{-a+be^{c+dx}}}{\sqrt{a}}\right)}{\sqrt{a}\,d}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/Sqrt[-a + b*E^(c + d*x)],x]
[Out] (2*ArcTan[Sqrt[-a + b*E^(c + d*x)]/Sqrt[a]])/(Sqrt[a]*d)
```

Maple [A]
time = 0.02, size = 28, normalized size = 0.82

method	result	size
derivativedivides	$\frac{2\arctan\left(\frac{\sqrt{-a+b\,e^{dx+c}}}{\sqrt{a}}\right)}{d\sqrt{a}}$	28
default	$\frac{2\arctan\left(\frac{\sqrt{-a+b\,e^{dx+c}}}{\sqrt{a}}\right)}{d\sqrt{a}}$	28

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a+b*exp(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
[Out] 2*arctan((-a+b*exp(d*x+c))^(1/2)/a^(1/2))/d/a^(1/2)
```

Maxima [A]
time = 0.49, size = 27, normalized size = 0.79

$$\frac{2\,\arctan\left(\frac{\sqrt{be^{(dx+c)}-a}}{\sqrt{a}}\right)}{\sqrt{a}\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a+b*exp(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] 2*arctan(sqrt(b*e^(d*x + c) - a)/sqrt(a))/(sqrt(a)*d)
```

Fricas [A]
time = 0.35, size = 85, normalized size = 2.50

$$\left[-\frac{\sqrt{-a}\log\left(\left(be^{(dx+c)}-2\sqrt{be^{(dx+c)}-a}\sqrt{-a}-2a\right)e^{(-dx-c)}\right)}{ad}, \frac{2\arctan\left(\frac{\sqrt{be^{(dx+c)}-a}}{\sqrt{a}}\right)}{\sqrt{a}d}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a+b*exp(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] [-sqrt(-a)*log((b*e^(d*x + c) - 2*sqrt(b*e^(d*x + c) - a)*sqrt(-a) - 2*a)*e
^(-d*x - c))/(a*d), 2*arctan(sqrt(b*e^(d*x + c) - a)/sqrt(a))/(sqrt(a)*d)]
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{1}{\sqrt{-a+be^{c+dx}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a+b*exp(d*x+c))**(1/2),x)
```

```
[Out] Integral(1/sqrt(-a + b*exp(c + d*x)), x)
```

Giac [A]
time = 7.23, size = 27, normalized size = 0.79

$$\frac{2\arctan\left(\frac{\sqrt{be^{(dx+c)}-a}}{\sqrt{a}}\right)}{\sqrt{a}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a+b*exp(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] 2*arctan(sqrt(b*e^(d*x + c) - a)/sqrt(a))/(sqrt(a)*d)
```

Mupad [B]
time = 3.62, size = 31, normalized size = 0.91

$$-\frac{2\,\mathrm{atanh}\left(\frac{\sqrt{b\,e^{d\,x}\,e^{c}-a}}{\sqrt{-a}}\right)}{\sqrt{-a}\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*exp(c + d*x) - a)^(1/2),x)
```

```
[Out] -(2*atanh((b*exp(d*x)*exp(c) - a)^(1/2)/(-a)^(1/2)))/((-a)^(1/2)*d)
```

3.700 $\int \sqrt{a+be^{c+dx}}\,dx$

Optimal. Leaf size=53

$$\frac{2\sqrt{a+be^{c+dx}}}{d}-\frac{2\sqrt{a}\,\tanh^{-1}\left(\frac{\sqrt{a+be^{c+dx}}}{\sqrt{a}}\right)}{d}$$

[Out] -2*arctanh((a+b*exp(d*x+c))^(1/2)/a^(1/2))*a^(1/2)/d+2*(a+b*exp(d*x+c))^(1/2)/d

Rubi [A]
time = 0.02, antiderivative size = 53, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$, Rules used = {2320, 52, 65, 214}

$$\frac{2\sqrt{a+be^{c+dx}}}{d}-\frac{2\sqrt{a}\,\tanh^{-1}\left(\frac{\sqrt{a+be^{c+dx}}}{\sqrt{a}}\right)}{d}$$

Antiderivative was successfully verified.

[In] Int[Sqrt[a + b*E^(c + d*x)],x]

[Out] (2*Sqrt[a + b*E^(c + d*x)])/d - (2*Sqrt[a]*ArcTanh[Sqrt[a + b*E^(c + d*x)]/Sqrt[a]])/d

Rule 52

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^n/(b*(m + n + 1))), x] + Dist[n*((b*c - a*d)/(
b*(m + n + 1))), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 214

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \sqrt{a+be^{c+dx}}\,dx = \frac{\text{Subst}\left(\int \frac{\sqrt{a+bx}}{x}\,dx, x, e^{c+dx}\right)}{d}$$

$$= \frac{2\sqrt{a+be^{c+dx}}}{d} + \frac{a\text{Subst}\left(\int \frac{1}{x\sqrt{a+bx}}\,dx, x, e^{c+dx}\right)}{d}$$

$$= \frac{2\sqrt{a+be^{c+dx}}}{d} + \frac{(2a)\text{Subst}\left(\int \frac{1}{-\frac{a}{b}+\frac{x^2}{b}}\,dx, x, \sqrt{a+be^{c+dx}}\right)}{bd}$$

$$= \frac{2\sqrt{a+be^{c+dx}}}{d} - \frac{2\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+be^{c+dx}}}{\sqrt{a}}\right)}{d}$$

Mathematica [A]
time = 0.04, size = 50, normalized size = 0.94

$$\frac{2\left(\sqrt{a+be^{c+dx}} - \sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+be^{c+dx}}}{\sqrt{a}}\right)\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[a + b*E^(c + d*x)],x]
[Out] (2*(Sqrt[a + b*E^(c + d*x)] - Sqrt[a]*ArcTanh[Sqrt[a + b*E^(c + d*x)]/Sqrt[
a]]))/d
```

Maple [A]
time = 0.03, size = 42, normalized size = 0.79

method	result	size
derivativedivides	$\frac{2\sqrt{a+b\,e^{dx+c}}-2\sqrt{a}\,\operatorname{arctanh}\left(\frac{\sqrt{a+b\,e^{dx+c}}}{\sqrt{a}}\right)}{d}$	42

default	$\frac{2\sqrt{a+b\,\mathrm{e}^{dx+c}}-2\sqrt{a}\,\operatorname{arctanh}\left(\frac{\sqrt{a+b\,\mathrm{e}^{dx+c}}}{\sqrt{a}}\right)}{d}$	42
risch	$-\frac{2\operatorname{arctanh}\left(\frac{\sqrt{a+b\,\mathrm{e}^{dx+c}}}{\sqrt{a}}\right)\sqrt{a}}{d}+\frac{2\sqrt{a+b\,\mathrm{e}^{dx+c}}}{d}$	44

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*exp(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/d*(2*(a+b*exp(d*x+c))^(1/2)-2*a^(1/2)*arctanh((a+b*exp(d*x+c))^(1/2)/a^(1
/2)))
```

Maxima [A]
time = 0.51, size = 63, normalized size = 1.19

$$\frac{\sqrt{a}\log\left(\frac{\sqrt{be^{(dx+c)}+a}-\sqrt{a}}{\sqrt{be^{(dx+c)}+a}+\sqrt{a}}\right)}{d}+\frac{2\sqrt{be^{(dx+c)}+a}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] sqrt(a)*log((sqrt(b*e^(d*x + c) + a) - sqrt(a))/(sqrt(b*e^(d*x + c) + a) +
sqrt(a)))/d + 2*sqrt(b*e^(d*x + c) + a)/d
```

Fricas [A]
time = 0.38, size = 110, normalized size = 2.08

$$\left[\frac{\sqrt{a}\log\left(\left(be^{(dx+c)}-2\sqrt{be^{(dx+c)}+a}\sqrt{a}+2a\right)e^{(-dx-c)}\right)+2\sqrt{be^{(dx+c)}+a}}{d},\ \frac{2\left(\sqrt{-a}\arctan\left(\frac{\sqrt{be^{(dx+c)}+a}\sqrt{-a}}{a}\right)+\sqrt{be^{(dx+c)}+a}\right)}{d}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] [(sqrt(a)*log((b*e^(d*x + c) - 2*sqrt(b*e^(d*x + c) + a)*sqrt(a) + 2*a)*e^(
-d*x - c)) + 2*sqrt(b*e^(d*x + c) + a))/d, 2*(sqrt(-a)*arctan(sqrt(b*e^(d*x
 + c) + a)*sqrt(-a)/a) + sqrt(b*e^(d*x + c) + a))/d]
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{a+be^{c+dx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*exp(c + d*x)), x)
```

Giac [A]
time = 3.72, size = 44, normalized size = 0.83

$$\frac{2\left(\frac{a\arctan\left(\frac{\sqrt{be^{(dx+c)}+a}}{\sqrt{-a}}\right)}{\sqrt{-a}}+\sqrt{be^{(dx+c)}+a}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] 2*(a*arctan(sqrt(b*e^(d*x + c) + a)/sqrt(-a))/sqrt(-a) + sqrt(b*e^(d*x + c)
 + a))/d
```

Mupad [B]
time = 3.52, size = 43, normalized size = 0.81

$$\frac{2\sqrt{a+b\,\mathrm{e}^{c+d\,x}}}{d}-\frac{2\sqrt{a}\,\mathrm{atanh}\left(\frac{\sqrt{a+b\,\mathrm{e}^{d\,x}\,\mathrm{e}^{c}}}{\sqrt{a}}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*exp(c + d*x))^(1/2),x)
```

```
[Out] (2*(a + b*exp(c + d*x))^(1/2))/d - (2*a^(1/2)*atanh((a + b*exp(d*x)*exp(c))
^(1/2)/a^(1/2)))/d
```

3.701 $\int \sqrt{-a+be^{c+dx}}\,dx$

Optimal. Leaf size=57

$$\frac{2\sqrt{-a+be^{c+dx}}}{d}-\frac{2\sqrt{a}\,\tan^{-1}\left(\frac{\sqrt{-a+be^{c+dx}}}{\sqrt{a}}\right)}{d}$$

```
[Out] -2*arctan((-a+b*exp(d*x+c))^(1/2)/a^(1/2))*a^(1/2)/d+2*(-a+b*exp(d*x+c))^(1
/2)/d
```

Rubi [A]
time = 0.03, antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.235, Rules used = {2320, 52, 65, 211}

$$\frac{2\sqrt{be^{c+dx}-a}}{d}-\frac{2\sqrt{a}\,\text{ArcTan}\left(\frac{\sqrt{be^{c+dx}-a}}{\sqrt{a}}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[-a + b*E^(c + d*x)],x]
```

```
[Out] (2*Sqrt[-a + b*E^(c + d*x)])/d - (2*Sqrt[a]*ArcTan[Sqrt[-a + b*E^(c + d*x)]
/Sqrt[a]])/d
```

Rule 52

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^n/(b*(m + n + 1))), x] + Dist[n*((b*c - a*d)/(
b*(m + n + 1))), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 65

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]/a)*ArcTan[x/R
t[a/b, 2]], x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \sqrt{-a+be^{c+dx}}\,dx = \frac{\text{Subst}\left(\int \frac{\sqrt{-a+bx}}{x}\,dx, x, e^{c+dx}\right)}{d}$$
$$= \frac{2\sqrt{-a+be^{c+dx}}}{d} - \frac{a\text{Subst}\left(\int \frac{1}{x\sqrt{-a+bx}}\,dx, x, e^{c+dx}\right)}{d}$$
$$= \frac{2\sqrt{-a+be^{c+dx}}}{d} - \frac{(2a)\text{Subst}\left(\int \frac{1}{\frac{a}{b}+\frac{x^2}{b}}\,dx, x, \sqrt{-a+be^{c+dx}}\right)}{bd}$$
$$= \frac{2\sqrt{-a+be^{c+dx}}}{d} - \frac{2\sqrt{a}\tan^{-1}\left(\frac{\sqrt{-a+be^{c+dx}}}{\sqrt{a}}\right)}{d}$$

Mathematica [A]
time = 0.04, size = 54, normalized size = 0.95

$$\frac{2\left(\sqrt{-a+be^{c+dx}} - \sqrt{a}\tan^{-1}\left(\frac{\sqrt{-a+be^{c+dx}}}{\sqrt{a}}\right)\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[-a + b*E^(c + d*x)],x]
[Out] (2*(Sqrt[-a + b*E^(c + d*x)] - Sqrt[a]*ArcTan[Sqrt[-a + b*E^(c + d*x)]/Sqrt
[a]]))/d
```

Maple [A]
time = 0.03, size = 46, normalized size = 0.81

method	result	size
derivativedivides	$\frac{2\sqrt{-a+b\,e^{dx+c}}-2\sqrt{a}\,\arctan\left(\frac{\sqrt{-a+b\,e^{dx+c}}}{\sqrt{a}}\right)}{d}$	46

default	$\frac{2\sqrt{-a+b\,\mathrm{e}^{dx+c}}-2\sqrt{a}\,\arctan\left(\frac{\sqrt{-a+b\,\mathrm{e}^{dx+c}}}{\sqrt{a}}\right)}{d}$	46
risch	$-\frac{2(a-b\,\mathrm{e}^{dx+c})}{d\sqrt{-a+b\,\mathrm{e}^{dx+c}}}-\frac{2\arctan\left(\frac{\sqrt{-a+b\,\mathrm{e}^{dx+c}}}{\sqrt{a}}\right)\sqrt{a}}{d}$	59

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a+b*exp(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/d*(2*(-a+b*exp(d*x+c))^(1/2)-2*a^(1/2)*arctan((-a+b*exp(d*x+c))^(1/2)/a^(
1/2)))
```

Maxima [A]
time = 0.49, size = 47, normalized size = 0.82

$$-\frac{2\sqrt{a}\arctan\left(\frac{\sqrt{be^{(dx+c)}-a}}{\sqrt{a}}\right)}{d}+\frac{2\sqrt{be^{(dx+c)}-a}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*exp(d*x+c))^(1/2),x, algorithm="maxima")
[Out] -2*sqrt(a)*arctan(sqrt(b*e^(d*x + c) - a)/sqrt(a))/d + 2*sqrt(b*e^(d*x + c)
 - a)/d
```

Fricas [A]
time = 0.38, size = 117, normalized size = 2.05

$$\left[\frac{\sqrt{-a}\log\left(\left(be^{(dx+c)}-2\sqrt{be^{(dx+c)}-a}\sqrt{-a}-2a\right)e^{(-dx-c)}\right)+2\sqrt{be^{(dx+c)}-a}}{d},-\frac{2\left(\sqrt{a}\arctan\left(\frac{\sqrt{be^{(dx+c)}-a}}{\sqrt{a}}\right)-\sqrt{be^{(dx+c)}-a}\right)}{d}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*exp(d*x+c))^(1/2),x, algorithm="fricas")
[Out] [(sqrt(-a)*log((b*e^(d*x + c) - 2*sqrt(b*e^(d*x + c) - a)*sqrt(-a) - 2*a)*e
^(-d*x - c)) + 2*sqrt(b*e^(d*x + c) - a))/d, -2*(sqrt(a)*arctan(sqrt(b*e^(d
*x + c) - a)/sqrt(a)) - sqrt(b*e^(d*x + c) - a))/d]
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{-a+be^{c+dx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*exp(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(-a + b*exp(c + d*x)), x)
```

Giac [A]
time = 5.29, size = 45, normalized size = 0.79

$$-\frac{2\left(\sqrt{a}\arctan\left(\frac{\sqrt{be^{(dx+c)}-a}}{\sqrt{a}}\right)-\sqrt{be^{(dx+c)}-a}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*exp(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] -2*(sqrt(a)*arctan(sqrt(b*e^(d*x + c) - a)/sqrt(a)) - sqrt(b*e^(d*x + c) -
a))/d
```

Mupad [B]
time = 3.60, size = 47, normalized size = 0.82

$$\frac{2\sqrt{b\,\mathrm{e}^{c+d\,x}-a}}{d}-\frac{2\sqrt{a}\,\mathrm{atan}\left(\frac{\sqrt{b\,\mathrm{e}^{d\,x}\,\mathrm{e}^{c}-a}}{\sqrt{a}}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*exp(c + d*x) - a)^(1/2),x)
```

```
[Out] (2*(b*exp(c + d*x) - a)^(1/2))/d - (2*a^(1/2)*atan((b*exp(d*x)*exp(c) - a)^
(1/2)/a^(1/2)))/d
```

3.702 $\int e^{6x}\sin(3x)\,dx$

Optimal. Leaf size=27

$$-\frac{1}{15}e^{6x}\cos(3x)+\frac{2}{15}e^{6x}\sin(3x)$$

```
[Out] -1/15*exp(6*x)*cos(3*x)+2/15*exp(6*x)*sin(3*x)
```

Rubi [A]
time = 0.01, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {4517}

$$\frac{2}{15}e^{6x}\sin(3x)-\frac{1}{15}e^{6x}\cos(3x)$$

Antiderivative was successfully verified.

```
[In] Int[E^(6*x)*Sin[3*x],x]
[Out] -1/15*(E^(6*x)*Cos[3*x]) + (2*E^(6*x)*Sin[3*x])/15
```

Rule 4517

```
Int[(F_)^((c_.)*((a_.) + (b_.)*(x_)))*Sin[(d_.) + (e_.)*(x_)], x_Symbol] :>
 Simp[b*c*Log[F]*F^(c*(a + b*x))*(Sin[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x
] - Simp[e*F^(c*(a + b*x))*(Cos[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x] /; F
reeQ[{F, a, b, c, d, e}, x] && NeQ[e^2 + b^2*c^2*Log[F]^2, 0]
```

Rubi steps

$$\int e^{6x}\sin(3x)\,dx=-\frac{1}{15}e^{6x}\cos(3x)+\frac{2}{15}e^{6x}\sin(3x)$$

Mathematica [A]
time = 0.02, size = 20, normalized size = 0.74

$$-\frac{1}{15}e^{6x}(\cos(3x)-2\sin(3x))$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(6*x)*Sin[3*x],x]
[Out] -1/15*(E^(6*x)*(Cos[3*x] - 2*Sin[3*x]))
```

Maple [A]
time = 0.03, size = 22, normalized size = 0.81

method	result	size
default	$-\frac{e^{6x} \cos(3x)}{15}+\frac{2 e^{6x} \sin(3x)}{15}$	22
risch	$-\frac{e^{(6+3i)x}}{30}-\frac{ie^{(6+3i)x}}{15}-\frac{e^{(6-3i)x}}{30}+\frac{ie^{(6-3i)x}}{15}$	36
norman	$\frac{\frac{4 e^{6x} \tan\left(\frac{3x}{2}\right)}{15}+\frac{e^{6x}\left(\tan^2\left(\frac{3x}{2}\right)\right)}{15}-\frac{e^{6x}}{15}}{1+\tan^2\left(\frac{3x}{2}\right)}$	41

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(6*x)*sin(3*x),x,method=_RETURNVERBOSE)
```

```
[Out] -1/15*exp(6*x)*cos(3*x)+2/15*exp(6*x)*sin(3*x)
```

Maxima [A]
time = 0.28, size = 17, normalized size = 0.63

$$-\frac{1}{15}\left(\cos\left(3\,x\right)-2\,\sin\left(3\,x\right)\right)e^{\left(6\,x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(6*x)*sin(3*x),x, algorithm="maxima")
```

```
[Out] -1/15*(cos(3*x) - 2*sin(3*x))*e^(6*x)
```

Fricas [A]
time = 0.36, size = 21, normalized size = 0.78

$$-\frac{1}{15}\,\cos\left(3\,x\right)e^{\left(6\,x\right)}+\frac{2}{15}\,e^{\left(6\,x\right)}\sin\left(3\,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(6*x)*sin(3*x),x, algorithm="fricas")
```

```
[Out] -1/15*cos(3*x)*e^(6*x) + 2/15*e^(6*x)*sin(3*x)
```

Sympy [A]
time = 0.08, size = 24, normalized size = 0.89

$$\frac{2e^{6x}\sin\left(3x\right)}{15}-\frac{e^{6x}\cos\left(3x\right)}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(6*x)*sin(3*x),x)
```

```
[Out] 2*exp(6*x)*sin(3*x)/15 - exp(6*x)*cos(3*x)/15
```

Giac [A]
time = 5.58, size = 17, normalized size = 0.63

$$-\frac{1}{15}\left(\cos\left(3\,x\right)-2\,\sin\left(3\,x\right)\right)e^{\left(6\,x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(6*x)*sin(3*x),x, algorithm="giac")
[Out] -1/15*(cos(3*x) - 2*sin(3*x))*e^(6*x)
```

Mupad [B]
time = 0.03, size = 19, normalized size = 0.70

$$-\frac{\mathrm{e}^{6\,x}\,\left(3\,\cos\left(3\,x\right)-6\,\sin\left(3\,x\right)\right)}{45}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sin(3*x)*exp(6*x),x)
[Out] -(exp(6*x)*(3*cos(3*x) - 6*sin(3*x)))/45
```

3.703 $\int \frac{e^{3x}}{1+e^{2x}}\,dx$

Optimal. Leaf size=10

$$e^x - \tan^{-1}(e^x)$$

[Out] exp(x)-arctan(exp(x))

Rubi [A]

time = 0.02, antiderivative size = 10, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {2280, 327, 209}

$$e^x - \text{ArcTan}(e^x)$$

Antiderivative was successfully verified.

[In] Int[E^(3*x)/(1 + E^(2*x)),x]

[Out] E^x - ArcTan[E^x]

Rule 209

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[b, 2]))*A
rcTan[Rt[b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^{3x}}{1+e^{2x}}\,dx = \text{Subst}\left(\int \frac{x^2}{1+x^2}\,dx, x, e^x\right)$$
$$= e^x - \text{Subst}\left(\int \frac{1}{1+x^2}\,dx, x, e^x\right)$$
$$= e^x - \tan^{-1}(e^x)$$

Mathematica [A]
time = 0.02, size = 10, normalized size = 1.00

$$e^x - \tan^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(3*x)/(1 + E^(2*x)),x]
[Out] E^x - ArcTan[E^x]
```

Maple [A]
time = 0.02, size = 9, normalized size = 0.90

method	result	size
default	$e^x - \arctan(e^x)$	9
risch	$e^x + \frac{i\ln(e^x-i)}{2} - \frac{i\ln(e^x+i)}{2}$	22

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(3*x)/(1+exp(2*x)),x,method=_RETURNVERBOSE)
[Out] exp(x)-arctan(exp(x))
```

Maxima [A]
time = 0.49, size = 8, normalized size = 0.80

$$-\arctan(e^x) + e^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)/(1+exp(2*x)),x, algorithm="maxima")
[Out] -arctan(e^x) + e^x
```

Fricas [A]
time = 0.37, size = 8, normalized size = 0.80

$$-\arctan(e^x) + e^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)/(1+exp(2*x)),x, algorithm="fricas")
```

```
[Out] -arctan(e^x) + e^x
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 19 vs. $2(7) = 14$.
time = 0.04, size = 19, normalized size = 1.90

$$e^x + \mathrm{RootSum}\left(4z^2 + 1, \left(i \mapsto i \log\left(-2i + e^x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)/(1+exp(2*x)),x)
```

```
[Out] exp(x) + RootSum(4*_z**2 + 1, Lambda(_i, _i*log(-2*_i + exp(x))))
```

Giac [A]
time = 4.14, size = 8, normalized size = 0.80

$$-\arctan\left(e^x\right) + e^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)/(1+exp(2*x)),x, algorithm="giac")
```

```
[Out] -arctan(e^x) + e^x
```

Mupad [B]
time = 0.08, size = 8, normalized size = 0.80

$$\mathrm{e}^x - \mathrm{atan}(\mathrm{e}^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(3*x)/(exp(2*x) + 1),x)
```

```
[Out] exp(x) - atan(exp(x))
```

3.704 $\int \frac{e^{3x}}{-1+e^{2x}}\,dx$

Optimal. Leaf size=10

$$e^x - \tanh^{-1}(e^x)$$

[Out] exp(x)-arctanh(exp(x))

Rubi [A]
time = 0.01, antiderivative size = 10, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2280, 327, 213}

$$e^x - \tanh^{-1}(e^x)$$

Antiderivative was successfully verified.

[In] Int[E^(3*x)/(-1 + E^(2*x)),x]

[Out] E^x - ArcTanh[E^x]

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^{3x}}{-1+e^{2x}}\,dx = \text{Subst}\left(\int \frac{x^2}{-1+x^2}\,dx, x, e^x\right)$$
$$= e^x + \text{Subst}\left(\int \frac{1}{-1+x^2}\,dx, x, e^x\right)$$
$$= e^x - \tanh^{-1}(e^x)$$

Mathematica [A]
time = 0.03, size = 10, normalized size = 1.00

$$e^x - \tanh^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(3*x)/(-1 + E^(2*x)),x]
```

```
[Out] E^x - ArcTanh[E^x]
```

Maple [B] Leaf count of result is larger than twice the leaf count of optimal. 17 vs. 2(8) = 16.
time = 0.02, size = 18, normalized size = 1.80

method	result	size
default	$e^x + \frac{\ln(-1+e^x)}{2} - \frac{\ln(1+e^x)}{2}$	18
norman	$e^x + \frac{\ln(-1+e^x)}{2} - \frac{\ln(1+e^x)}{2}$	18
risch	$e^x + \frac{\ln(-1+e^x)}{2} - \frac{\ln(1+e^x)}{2}$	18

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(3*x)/(-1+exp(2*x)),x,method=_RETURNVERBOSE)
```

```
[Out] exp(x)+1/2*ln(-1+exp(x))-1/2*ln(1+exp(x))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 17 vs. 2(8) = 16.
time = 0.30, size = 17, normalized size = 1.70

$$e^x - \frac{1}{2}\log(e^x + 1) + \frac{1}{2}\log(e^x - 1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)/(-1+exp(2*x)),x, algorithm="maxima")
```

```
[Out] e^x - 1/2*log(e^x + 1) + 1/2*log(e^x - 1)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 17 vs. $2(8) = 16$.
time = 0.36, size = 17, normalized size = 1.70

$$e^x - \frac{1}{2}\log(e^x + 1) + \frac{1}{2}\log(e^x - 1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)/(-1+exp(2*x)),x, algorithm="fricas")
```

```
[Out] e^x - 1/2*log(e^x + 1) + 1/2*log(e^x - 1)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 19 vs. $2(7) = 14$.
time = 0.04, size = 19, normalized size = 1.90

$$e^x + \frac{\log(e^x - 1)}{2} - \frac{\log(e^x + 1)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)/(-1+exp(2*x)),x)
```

```
[Out] exp(x) + log(exp(x) - 1)/2 - log(exp(x) + 1)/2
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 18 vs. $2(8) = 16$.
time = 6.14, size = 18, normalized size = 1.80

$$e^x - \frac{1}{2}\log(e^x + 1) + \frac{1}{2}\log(|e^x - 1|)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)/(-1+exp(2*x)),x, algorithm="giac")
```

```
[Out] e^x - 1/2*log(e^x + 1) + 1/2*log(abs(e^x - 1))
```

Mupad [B]
time = 0.10, size = 17, normalized size = 1.70

$$\frac{\ln(e^x - 1)}{2} - \frac{\ln(e^x + 1)}{2} + e^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(3*x)/(exp(2*x) - 1),x)
```

```
[Out] log(exp(x) - 1)/2 - log(exp(x) + 1)/2 + exp(x)
```

3.705 $\int \frac{e^{-x}}{\sqrt{1+e^{2x}}}\,dx$

Optimal. Leaf size=18

$$-e^{-x}\sqrt{1+e^{2x}}$$

```
[Out] -(1+exp(2*x))^(1/2)/exp(x)
```

Rubi [A]

time = 0.02, antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$, Rules used = {2281, 197}

$$-e^{-x}\sqrt{e^{2x}+1}$$

Antiderivative was successfully verified.

```
[In] Int[1/(E^x*Sqrt[1 + E^(2*x)]),x]
```

```
[Out] -(Sqrt[1 + E^(2*x)]/E^x)
```

Rule 197

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^{-x}}{\sqrt{1+e^{2x}}}\,dx = -\text{Subst}\left(\int \frac{1}{\sqrt{1+\frac{1}{x^2}}}\,dx, x, e^{-x}\right)$$
$$= -e^{-x}\sqrt{1+e^{2x}}$$

Mathematica [A]
time = 2.33, size = 18, normalized size = 1.00

$$-e^{-x}\sqrt{1+e^{2x}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(E^x*Sqrt[1 + E^(2*x)]),x]
[Out] -(Sqrt[1 + E^(2*x)]/E^x)
```

Maple [A]
time = 0.02, size = 15, normalized size = 0.83

method	result	size
default	$-{\mathrm e}^{-x}\sqrt{1+{\mathrm e}^{2x}}$	15

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/exp(x)/(1+exp(2*x))^(1/2),x,method=_RETURNVERBOSE)
[Out] -1/exp(x)*(1+exp(x)^2)^(1/2)
```

Maxima [A]
time = 0.28, size = 14, normalized size = 0.78

$$-\sqrt{e^{(2x)}+1}\,e^{(-x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(x)/(1+exp(2*x))^(1/2),x, algorithm="maxima")
[Out] -sqrt(e^(2*x) + 1)*e^(-x)
```

Fricas [A]
time = 0.35, size = 10, normalized size = 0.56

$$-\sqrt{e^{(-2x)}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(x)/(1+exp(2*x))^(1/2),x, algorithm="fricas")
[Out] -sqrt(e^(-2*x) + 1)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{-x}}{\sqrt{e^{2x}+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(x)/(1+exp(2*x))**(1/2),x)
```

```
[Out] Integral(exp(-x)/sqrt(exp(2*x) + 1), x)
```

Giac [A]
time = 6.28, size = 21, normalized size = 1.17

$$\frac{2}{\left(\sqrt{e^{(2x)}+1}-e^{x}\right)^{2}-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(x)/(1+exp(2*x))^(1/2),x, algorithm="giac")
```

```
[Out] 2/((sqrt(e^(2*x) + 1) - e^x)^2 - 1)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{e^{-x}}{\sqrt{e^{2x}+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-x)/(exp(2*x) + 1)^(1/2),x)
```

```
[Out] int(exp(-x)/(exp(2*x) + 1)^(1/2), x)
```

3.706 $\int \frac{e^x}{-1-8e^x+e^{2x}}\,dx$

Optimal. Leaf size=20

$$\frac{\tanh^{-1}\left(\frac{4-e^x}{\sqrt{17}}\right)}{\sqrt{17}}$$

[Out] 1/17*arctanh(1/17*(4-exp(x))*17^(1/2))*17^(1/2)

Rubi [A]
time = 0.03, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {2320, 632, 212}

$$\frac{\tanh^{-1}\left(\frac{4-e^x}{\sqrt{17}}\right)}{\sqrt{17}}$$

Antiderivative was successfully verified.

[In] Int[E^x/(-1 - 8*E^x + E^(2*x)),x]

[Out] ArcTanh[(4 - E^x)/Sqrt[17]]/Sqrt[17]

Rule 212

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 632

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{e^x}{-1-8e^x+e^{2x}}\,dx = \text{Subst}\left(\int \frac{1}{-1-8x+x^2}\,dx, x, e^x\right)$$
$$= -\left(2\text{Subst}\left(\int \frac{1}{68-x^2}\,dx, x, -8+2e^x\right)\right)$$
$$= \frac{\tanh^{-1}\left(\frac{4-e^x}{\sqrt{17}}\right)}{\sqrt{17}}$$

Mathematica [A]
time = 0.05, size = 19, normalized size = 0.95

$$-\frac{\tanh^{-1}\left(\frac{-4+e^x}{\sqrt{17}}\right)}{\sqrt{17}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(-1 - 8*E^x + E^(2*x)),x]
[Out] -(ArcTanh[(-4 + E^x)/Sqrt[17]]/Sqrt[17])
```

Maple [A]
time = 0.02, size = 18, normalized size = 0.90

method	result	size
default	$-\frac{\sqrt{17}\,\operatorname{arctanh}\left(\frac{(2\,e^{x}-8)\sqrt{17}}{34}\right)}{17}$	18
risch	$\frac{\sqrt{17}\,\ln\left(e^{x}-4-\sqrt{17}\right)}{34}-\frac{\sqrt{17}\,\ln\left(e^{x}-4+\sqrt{17}\right)}{34}$	30

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(-1-8*exp(x)+exp(2*x)),x,method=_RETURNVERBOSE)
[Out] -1/17*17^(1/2)*arctanh(1/34*(2*exp(x)-8)*17^(1/2))
```

Maxima [A]
time = 0.52, size = 26, normalized size = 1.30

$$\frac{1}{34}\sqrt{17}\log\left(-\frac{\sqrt{17}-e^x+4}{\sqrt{17}+e^x-4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-1-8*exp(x)+exp(2*x)),x, algorithm="maxima")
```

```
[Out] 1/34*sqrt(17)*log(-(sqrt(17) - e^x + 4)/(sqrt(17) + e^x - 4))
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 42 vs. $2(15) = 30$.
time = 0.34, size = 42, normalized size = 2.10

$$\frac{1}{34}\sqrt{17}\log\left(-\frac{2\left(\sqrt{17}+4\right)e^x - 8\sqrt{17} - e^{(2x)} - 33}{e^{(2x)} - 8e^x - 1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-1-8*exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/34*sqrt(17)*log(-(2*(sqrt(17) + 4)*e^x - 8*sqrt(17) - e^(2*x) - 33)/(e^(2
*x) - 8*e^x - 1))
```

Sympy [A]
time = 0.04, size = 17, normalized size = 0.85

$$\text{RootSum}\left(68z^2 - 1, \left(i \mapsto i\log\left(-34i + e^x - 4\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-1-8*exp(x)+exp(2*x)),x)
```

```
[Out] RootSum(68*_z**2 - 1, Lambda(_i, _i*log(-34*_i + exp(x) - 4)))
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 33 vs. $2(15) = 30$.
time = 4.59, size = 33, normalized size = 1.65

$$\frac{1}{34}\sqrt{17}\log\left(\frac{\left|-2\sqrt{17} + 2e^x - 8\right|}{\left|2\sqrt{17} + 2e^x - 8\right|}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-1-8*exp(x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] 1/34*sqrt(17)*log(abs(-2*sqrt(17) + 2*e^x - 8)/abs(2*sqrt(17) + 2*e^x - 8))
```

Mupad [B]
time = 0.39, size = 17, normalized size = 0.85

$$-\frac{\sqrt{17}\,\text{atanh}\left(\frac{\sqrt{17}\,\left(2\,e^x-8\right)}{34}\right)}{17}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-exp(x)/(8*exp(x) - exp(2*x) + 1),x)
```

```
[Out] -(17^(1/2)*atanh((17^(1/2)*(2*exp(x) - 8))/34))/17
```

3.707 $\int e^{7x}x^3\,dx$

Optimal. Leaf size=44

$$-\frac{6e^{7x}}{2401}+\frac{6}{343}e^{7x}x-\frac{3}{49}e^{7x}x^2+\frac{1}{7}e^{7x}x^3$$

```
[Out] -6/2401*exp(7*x)+6/343*exp(7*x)*x-3/49*exp(7*x)*x^2+1/7*exp(7*x)*x^3
```

Rubi [A]
time = 0.02, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}=0.222$, Rules used = {2207, 2225}

$$\frac{1}{7}e^{7x}x^3-\frac{3}{49}e^{7x}x^2+\frac{6}{343}e^{7x}x-\frac{6e^{7x}}{2401}$$

Antiderivative was successfully verified.

```
[In] Int[E^(7*x)*x^3,x]
```

```
[Out] (-6*E^(7*x))/2401 + (6*E^(7*x)*x)/343 - (3*E^(7*x)*x^2)/49 + (E^(7*x)*x^3)/
7
```

Rule 2207

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[(c + d*x)^m*((b*F^(g*(e + f*x)))^n/(f*g*n*Log[F])),
x] - Dist[d*(m/(f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !TrueQ[$UseGamma]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned}
\int e^{7x}x^3\,dx &= \frac{1}{7}e^{7x}x^3-\frac{3}{7}\int e^{7x}x^2\,dx\\
&= -\frac{3}{49}e^{7x}x^2+\frac{1}{7}e^{7x}x^3+\frac{6}{49}\int e^{7x}x\,dx\\
&= \frac{6}{343}e^{7x}x-\frac{3}{49}e^{7x}x^2+\frac{1}{7}e^{7x}x^3-\frac{6}{343}\int e^{7x}\,dx\\
&= -\frac{6e^{7x}}{2401}+\frac{6}{343}e^{7x}x-\frac{3}{49}e^{7x}x^2+\frac{1}{7}e^{7x}x^3
\end{aligned}$$

Mathematica [A]
time = 0.01, size = 24, normalized size = 0.55

$$\frac{e^{7x}(-6+42x-147x^2+343x^3)}{2401}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(7*x)*x^3,x]
```

```
[Out] (E^(7*x)*(-6 + 42*x - 147*x^2 + 343*x^3))/2401
```

Maple [A]
time = 0.02, size = 33, normalized size = 0.75

method	result	size
risch	$\left(\frac{1}{7}x^3-\frac{3}{49}x^2+\frac{6}{343}x-\frac{6}{2401}\right)e^{7x}$	21
gosper	$\frac{(343x^3-147x^2+42x-6)e^{7x}}{2401}$	22
meijerg	$\frac{6}{2401}-\frac{(-1372x^3+588x^2-168x+24)e^{7x}}{9604}$	24
derivativedivides	$-\frac{6e^{7x}}{2401}+\frac{6e^{7x}x}{343}-\frac{3e^{7x}x^2}{49}+\frac{e^{7x}x^3}{7}$	33
default	$-\frac{6e^{7x}}{2401}+\frac{6e^{7x}x}{343}-\frac{3e^{7x}x^2}{49}+\frac{e^{7x}x^3}{7}$	33
norman	$-\frac{6e^{7x}}{2401}+\frac{6e^{7x}x}{343}-\frac{3e^{7x}x^2}{49}+\frac{e^{7x}x^3}{7}$	33

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(7*x)*x^3,x,method=_RETURNVERBOSE)
```

```
[Out] -6/2401*exp(7*x)+6/343*exp(7*x)*x-3/49*exp(7*x)*x^2+1/7*exp(7*x)*x^3
```

Maxima [A]
time = 0.28, size = 21, normalized size = 0.48

$$\frac{1}{2401}\left(343\,x^3-147\,x^2+42\,x-6\right)e^{(7\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(7*x)*x^3,x, algorithm="maxima")
```

```
[Out] 1/2401*(343*x^3 - 147*x^2 + 42*x - 6)*e^(7*x)
```

Fricas [A]
time = 0.35, size = 21, normalized size = 0.48

$$\frac{1}{2401}\left(343\,x^3-147\,x^2+42\,x-6\right)e^{(7\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(7*x)*x^3,x, algorithm="fricas")
```

```
[Out] 1/2401*(343*x^3 - 147*x^2 + 42*x - 6)*e^(7*x)
```

Sympy [A]
time = 0.02, size = 20, normalized size = 0.45

$$\frac{(343x^3 - 147x^2 + 42x - 6)\,e^{7x}}{2401}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(7*x)*x**3,x)
```

```
[Out] (343*x**3 - 147*x**2 + 42*x - 6)*exp(7*x)/2401
```

Giac [A]
time = 5.29, size = 21, normalized size = 0.48

$$\frac{1}{2401}\left(343\,x^3 - 147\,x^2 + 42\,x - 6\right)e^{(7\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(7*x)*x^3,x, algorithm="giac")
```

```
[Out] 1/2401*(343*x^3 - 147*x^2 + 42*x - 6)*e^(7*x)
```

Mupad [B]
time = 0.03, size = 21, normalized size = 0.48

$$\frac{\mathrm{e}^{7\,x}\,(343\,x^3 - 147\,x^2 + 42\,x - 6)}{2401}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*exp(7*x),x)
```

```
[Out] (exp(7*x)*(42*x - 147*x^2 + 343*x^3 - 6))/2401
```

3.708 $\int e^{8-2x}x^3\,dx$

Optimal. Leaf size=52

$$-\frac{3}{8}e^{8-2x}-\frac{3}{4}e^{8-2x}x-\frac{3}{4}e^{8-2x}x^2-\frac{1}{2}e^{8-2x}x^3$$

```
[Out] -3/8*exp(8-2*x)-3/4*exp(8-2*x)*x-3/4*exp(8-2*x)*x^2-1/2*exp(8-2*x)*x^3
```

Rubi [A]
time = 0.03, antiderivative size = 52, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = {2207, 2225}

$$-\frac{1}{2}e^{8-2x}x^3-\frac{3}{4}e^{8-2x}x^2-\frac{3}{4}e^{8-2x}x-\frac{3}{8}e^{8-2x}$$

Antiderivative was successfully verified.

```
[In] Int[E^(8 - 2*x)*x^3,x]
```

```
[Out] (-3*E^(8 - 2*x))/8 - (3*E^(8 - 2*x)*x)/4 - (3*E^(8 - 2*x)*x^2)/4 - (E^(8 -
2*x)*x^3)/2
```

Rule 2207

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[(c + d*x)^m*((b*F^(g*(e + f*x)))^n/(f*g*n*Log[F])),
x] - Dist[d*(m/(f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !TrueQ[$UseGamma]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned}
\int e^{8-2x}x^3\,dx &= -\frac{1}{2}e^{8-2x}x^3+\frac{3}{2}\int e^{8-2x}x^2\,dx\\
&= -\frac{3}{4}e^{8-2x}x^2-\frac{1}{2}e^{8-2x}x^3+\frac{3}{2}\int e^{8-2x}x\,dx\\
&= -\frac{3}{4}e^{8-2x}x-\frac{3}{4}e^{8-2x}x^2-\frac{1}{2}e^{8-2x}x^3+\frac{3}{4}\int e^{8-2x}\,dx\\
&= -\frac{3}{8}e^{8-2x}-\frac{3}{4}e^{8-2x}x-\frac{3}{4}e^{8-2x}x^2-\frac{1}{2}e^{8-2x}x^3
\end{aligned}$$

Mathematica [A]
time = 0.02, size = 26, normalized size = 0.50

$$-\frac{1}{8}e^{8-2x}(3+6x+6x^2+4x^3)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(8 - 2*x)*x^3,x]
```

```
[Out] -1/8*(E^(8 - 2*x)*(3 + 6*x + 6*x^2 + 4*x^3))
```

Maple [A]
time = 0.02, size = 53, normalized size = 1.02

method	result	size
risch	$\left(-\frac{1}{2}x^3-\frac{3}{4}x^2-\frac{3}{4}x-\frac{3}{8}\right)\mathrm{e}^{8-2x}$	23
gosper	$-\frac{(4x^3+6x^2+6x+3)\mathrm{e}^{8-2x}}{8}$	24
meijerg	$\frac{\mathrm{e}^8\left(6-\frac{(32x^3+48x^2+48x+24)\mathrm{e}^{-2x}}{4}\right)}{16}$	28
norman	$-\frac{3\,\mathrm{e}^{8-2x}}{8}-\frac{3\,\mathrm{e}^{8-2x}x}{4}-\frac{3\,\mathrm{e}^{8-2x}x^2}{4}-\frac{\mathrm{e}^{8-2x}x^3}{2}$	41
derivativedivides	$\frac{123\,\mathrm{e}^{8-2x}(8-2x)}{8}-\frac{379\,\mathrm{e}^{8-2x}}{8}-\frac{27\,\mathrm{e}^{8-2x}(8-2x)^2}{16}+\frac{\mathrm{e}^{8-2x}(8-2x)^3}{16}$	53
default	$\frac{123\,\mathrm{e}^{8-2x}(8-2x)}{8}-\frac{379\,\mathrm{e}^{8-2x}}{8}-\frac{27\,\mathrm{e}^{8-2x}(8-2x)^2}{16}+\frac{\mathrm{e}^{8-2x}(8-2x)^3}{16}$	53

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(8-2*x)*x^3,x,method=_RETURNVERBOSE)
```

```
[Out] 123/8*exp(8-2*x)*(8-2*x)-379/8*exp(8-2*x)-27/16*exp(8-2*x)*(8-2*x)^2+1/16*e
xp(8-2*x)*(8-2*x)^3
```

Maxima [A]
time = 0.29, size = 30, normalized size = 0.58

$$-\frac{1}{8}\left(4\,x^3e^8+6\,x^2e^8+6\,xe^8+3\,e^8\right)e^{(-2\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(8-2*x)*x^3,x, algorithm="maxima")
```

```
[Out] -1/8*(4*x^3*e^8 + 6*x^2*e^8 + 6*x*e^8 + 3*e^8)*e^(-2*x)
```

Fricas [A]
time = 0.34, size = 23, normalized size = 0.44

$$-\frac{1}{8}\left(4\,x^3+6\,x^2+6\,x+3\right)e^{(-2\,x+8)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(8-2*x)*x^3,x, algorithm="fricas")
```

```
[Out] -1/8*(4*x^3 + 6*x^2 + 6*x + 3)*e^(-2*x + 8)
```

Sympy [A]
time = 0.03, size = 24, normalized size = 0.46

$$\frac{(-4x^3 - 6x^2 - 6x - 3)\,e^{8-2x}}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(8-2*x)*x**3,x)
```

```
[Out] (-4*x**3 - 6*x**2 - 6*x - 3)*exp(8 - 2*x)/8
```

Giac [A]
time = 6.48, size = 23, normalized size = 0.44

$$-\frac{1}{8}\left(4\,x^3 + 6\,x^2 + 6\,x + 3\right)e^{(-2\,x+8)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(8-2*x)*x^3,x, algorithm="giac")
```

```
[Out] -1/8*(4*x^3 + 6*x^2 + 6*x + 3)*e^(-2*x + 8)
```

Mupad [B]
time = 0.05, size = 23, normalized size = 0.44

$$-\mathrm{e}^{8-2\,x}\left(\frac{x^3}{2} + \frac{3\,x^2}{4} + \frac{3\,x}{4} + \frac{3}{8}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*exp(8 - 2*x),x)
```

```
[Out] -exp(8 - 2*x)*((3*x)/4 + (3*x^2)/4 + x^3/2 + 3/8)
```

3.709 $\int e^x \sqrt{9 - e^{2x}}\, dx$

Optimal. Leaf size=33

$$\frac{1}{2}e^x\sqrt{9-e^{2x}} + \frac{9}{2}\sin^{-1}\left(\frac{e^x}{3}\right)$$

```
[Out] 9/2*arcsin(1/3*exp(x))+1/2*exp(x)*(9-exp(2*x))^(1/2)
```

Rubi [A]
time = 0.02, antiderivative size = 33, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.176$, Rules used = {2281, 201, 222}

$$\frac{9}{2}\text{ArcSin}\left(\frac{e^x}{3}\right) + \frac{1}{2}e^x\sqrt{9-e^{2x}}$$

Antiderivative was successfully verified.

```
[In] Int[E^x*Sqrt[9 - E^(2*x)],x]
```

```
[Out] (E^x*Sqrt[9 - E^(2*x)])/2 + (9*ArcSin[E^x/3])/2
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int e^x\sqrt{9-e^{2x}}\,dx = \text{Subst}\left(\int \sqrt{9-x^2}\,dx, x, e^x\right)$$
$$= \frac{1}{2}e^x\sqrt{9-e^{2x}} + \frac{9}{2}\text{Subst}\left(\int \frac{1}{\sqrt{9-x^2}}\,dx, x, e^x\right)$$
$$= \frac{1}{2}e^x\sqrt{9-e^{2x}} + \frac{9}{2}\sin^{-1}\left(\frac{e^x}{3}\right)$$

Mathematica [A]
time = 0.06, size = 45, normalized size = 1.36

$$\frac{1}{2}e^x\sqrt{9-e^{2x}} - 9\tan^{-1}\left(\frac{\sqrt{9-e^{2x}}}{3+e^x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*Sqrt[9 - E^(2*x)],x]
```

```
[Out] (E^x*Sqrt[9 - E^(2*x)])/2 - 9*ArcTan[Sqrt[9 - E^(2*x)]/(3 + E^x)]
```

Maple [A]
time = 0.02, size = 23, normalized size = 0.70

method	result	size
default	$\frac{9\arcsin\left(\frac{e^x}{3}\right)}{2}+\frac{e^x\sqrt{9-e^{2x}}}{2}$	23
risch	$-\frac{e^x\left(-9+e^{2x}\right)}{2\sqrt{9-e^{2x}}}+\frac{9\arcsin\left(\frac{e^x}{3}\right)}{2}$	29

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(9-exp(2*x))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 1/2*exp(x)*(9-exp(x)^2)^(1/2)+9/2*arcsin(1/3*exp(x))
```

Maxima [A]
time = 0.51, size = 22, normalized size = 0.67

$$\frac{1}{2}\sqrt{-e^{(2x)}+9}\,e^x + \frac{9}{2}\arcsin\left(\frac{1}{3}e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(9-exp(2*x))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(-e^(2*x) + 9)*e^x + 9/2*arcsin(1/3*e^x)
```

Fricas [A]
time = 0.37, size = 35, normalized size = 1.06

$$\frac{1}{2}\,\sqrt{-e^{(2\,x)}+9}\,e^{x}-9\,\arctan\left(\left(\sqrt{-e^{(2\,x)}+9}-3\right)e^{(-x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(9-exp(2*x))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/2*sqrt(-e^(2*x) + 9)*e^x - 9*arctan((sqrt(-e^(2*x) + 9) - 3)*e^(-x))
```

Sympy [A]
time = 0.63, size = 32, normalized size = 0.97

$$\begin{cases}\frac{\sqrt{9-e^{2x}}\,e^{x}}{2}+\frac{9\operatorname{asin}\left(\frac{e^{x}}{3}\right)}{2} & \text{for}\ e^{x}>-3\wedge e^{x}<3\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(9-exp(2*x))**(1/2),x)
```

```
[Out] Piecewise((sqrt(9 - exp(2*x))*exp(x)/2 + 9*asin(exp(x)/3)/2, (exp(x) > -3)
& (exp(x) < 3)))
```

Giac [A]
time = 4.60, size = 22, normalized size = 0.67

$$\frac{1}{2}\,\sqrt{-e^{(2\,x)}+9}\,e^{x}+\frac{9}{2}\,\arcsin\left(\frac{1}{3}\,e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(9-exp(2*x))^(1/2),x, algorithm="giac")
```

```
[Out] 1/2*sqrt(-e^(2*x) + 9)*e^x + 9/2*arcsin(1/3*e^x)
```

Mupad [B]
time = 0.09, size = 22, normalized size = 0.67

$$\frac{9\operatorname{asin}\left(\frac{\mathrm{e}^{x}}{3}\right)}{2}+\frac{\mathrm{e}^{x}\,\sqrt{9-\mathrm{e}^{2\,x}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(9 - exp(2*x))^(1/2),x)
```

```
[Out] (9*asin(exp(x)/3))/2 + (exp(x)*(9 - exp(2*x))^(1/2))/2
```

3.710 $\int e^{6x}\sqrt{9-e^{2x}}\,dx$

Optimal. Leaf size=50

$$-27\left(9-e^{2x}\right)^{3/2}+\frac{18}{5}\left(9-e^{2x}\right)^{5/2}-\frac{1}{7}\left(9-e^{2x}\right)^{7/2}$$

```
[Out] -27*(9-exp(2*x))^(3/2)+18/5*(9-exp(2*x))^(5/2)-1/7*(9-exp(2*x))^(7/2)
```

Rubi [A]
time = 0.02, antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.105$, Rules used = {2280, 45}

$$-\frac{1}{7}\left(9-e^{2x}\right)^{7/2}+\frac{18}{5}\left(9-e^{2x}\right)^{5/2}-27\left(9-e^{2x}\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(6*x)*Sqrt[9 - E^(2*x)],x]
```

```
[Out] -27*(9 - E^(2*x))^(3/2) + (18*(9 - E^(2*x))^(5/2))/5 - (9 - E^(2*x))^(7/2)/
7
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int e^{6x}\sqrt{9-e^{2x}}\,dx &= \frac{1}{2}\text{Subst}\left(\int\sqrt{9-x}\,x^2\,dx,x,e^{2x}\right)\\ &= \frac{1}{2}\text{Subst}\left(\int\left(81\sqrt{9-x}-18(9-x)^{3/2}+(9-x)^{5/2}\right)dx,x,e^{2x}\right)\\ &= -27\left(9-e^{2x}\right)^{3/2}+\frac{18}{5}\left(9-e^{2x}\right)^{5/2}-\frac{1}{7}\left(9-e^{2x}\right)^{7/2}\end{aligned}$$

Mathematica [A]
time = 0.03, size = 33, normalized size = 0.66

$$-\frac{1}{35}\left(9-e^{2x}\right)^{3/2}\left(216+36e^{2x}+5e^{4x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(6*x)*Sqrt[9 - E^(2*x)],x]
```

```
[Out] -1/35*((9 - E^(2*x))^(3/2)*(216 + 36*E^(2*x) + 5*E^(4*x)))
```

Maple [A]
time = 0.02, size = 46, normalized size = 0.92

method	result	size
risch	$-\frac{\left(5\,\mathrm{e}^{6x}-9\,\mathrm{e}^{4x}-108\,\mathrm{e}^{2x}-1944\right)\left(-9+\mathrm{e}^{2x}\right)}{35\sqrt{9-\mathrm{e}^{2x}}}$	39
default	$-\frac{\mathrm{e}^{4x}\left(9-\mathrm{e}^{2x}\right)^{\frac{3}{2}}}{7}-\frac{36\,\mathrm{e}^{2x}\left(9-\mathrm{e}^{2x}\right)^{\frac{3}{2}}}{35}-\frac{216\left(9-\mathrm{e}^{2x}\right)^{\frac{3}{2}}}{35}$	46

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(6*x)*(9-exp(2*x))^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] -1/7*exp(x)^4*(9-exp(x)^2)^(3/2)-36/35*exp(x)^2*(9-exp(x)^2)^(3/2)-216/35*(
9-exp(x)^2)^(3/2)
```

Maxima [A]
time = 0.28, size = 37, normalized size = 0.74

$$-\frac{1}{7}\left(-e^{(2x)}+9\right)^{\frac{7}{2}}+\frac{18}{5}\left(-e^{(2x)}+9\right)^{\frac{5}{2}}-27\left(-e^{(2x)}+9\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(6*x)*(9-exp(2*x))^(1/2),x, algorithm="maxima")
```

```
[Out] -1/7*(-e^(2*x) + 9)^(7/2) + 18/5*(-e^(2*x) + 9)^(5/2) - 27*(-e^(2*x) + 9)^(
3/2)
```

Fricas [A]
time = 0.36, size = 32, normalized size = 0.64

$$\frac{1}{35}\left(5\,e^{(6x)}-9\,e^{(4x)}-108\,e^{(2x)}-1944\right)\sqrt{-e^{(2x)}+9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(6*x)*(9-exp(2*x))^(1/2),x, algorithm="fricas")
```

[Out] 1/35*(5*e^(6*x) - 9*e^(4*x) - 108*e^(2*x) - 1944)*sqrt(-e^(2*x) + 9)

Sympy [A]
time = 1.56, size = 44, normalized size = 0.88

$$\begin{cases} -\frac{(9-e^{2x})^{\frac{7}{2}}}{7} + \frac{18(9-e^{2x})^{\frac{5}{2}}}{5} - 27(9-e^{2x})^{\frac{3}{2}} & \text{for } e^x > -3 \wedge e^x < 3 \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(exp(6*x)*(9-exp(2*x))**(1/2),x)

[Out] Piecewise((-(9 - exp(2*x))**(7/2)/7 + 18*(9 - exp(2*x))**(5/2)/5 - 27*(9 - exp(2*x))**(3/2), (exp(x) > -3) & (exp(x) < 3)))

Giac [A]
time = 3.72, size = 53, normalized size = 1.06

$$\frac{1}{7}\left(e^{(2x)}-9\right)^3\sqrt{-e^{(2x)}+9}+\frac{18}{5}\left(e^{(2x)}-9\right)^2\sqrt{-e^{(2x)}+9}-27\left(-e^{(2x)}+9\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(exp(6*x)*(9-exp(2*x))^(1/2),x, algorithm="giac")

[Out] 1/7*(e^(2*x) - 9)^3*sqrt(-e^(2*x) + 9) + 18/5*(e^(2*x) - 9)^2*sqrt(-e^(2*x) + 9) - 27*(-e^(2*x) + 9)^(3/2)

Mupad [B]
time = 3.57, size = 32, normalized size = 0.64

$$-\sqrt{9-\mathrm{e}^{2x}}\left(\frac{108\,\mathrm{e}^{2x}}{35}+\frac{9\,\mathrm{e}^{4x}}{35}-\frac{\mathrm{e}^{6x}}{7}+\frac{1944}{35}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(exp(6*x)*(9 - exp(2*x))^(1/2),x)

[Out] -(9 - exp(2*x))^(1/2)*((108*exp(2*x))/35 + (9*exp(4*x))/35 - exp(6*x)/7 + 1944/35)

3.711 $\int \frac{e^{6x}}{(9-e^x)^{5/2}}\,dx$

Optimal. Leaf size=81

$$\frac{39366}{(9-e^x)^{3/2}}-\frac{65610}{\sqrt{9-e^x}}-14580\sqrt{9-e^x}+540(9-e^x)^{3/2}-18(9-e^x)^{5/2}+\frac{2}{7}(9-e^x)^{7/2}$$

```
[Out] 39366/(9-exp(x))^(3/2)+540*(9-exp(x))^(3/2)-18*(9-exp(x))^(5/2)+2/7*(9-exp(
x))^(7/2)-65610/(9-exp(x))^(1/2)-14580*(9-exp(x))^(1/2)
```

Rubi [A]
time = 0.03, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}=0.118$, Rules used = {2280, 45}

$$\frac{2}{7}(9-e^x)^{7/2}-18(9-e^x)^{5/2}+540(9-e^x)^{3/2}-14580\sqrt{9-e^x}-\frac{65610}{\sqrt{9-e^x}}+\frac{39366}{(9-e^x)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[E^(6*x)/(9 - E^x)^(5/2),x]
```

```
[Out] 39366/(9 - E^x)^(3/2) - 65610/Sqrt[9 - E^x] - 14580*Sqrt[9 - E^x] + 540*(9
- E^x)^(3/2) - 18*(9 - E^x)^(5/2) + (2*(9 - E^x)^(7/2))/7
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^{6x}}{(9-e^x)^{5/2}}\,dx = \text{Subst}\left(\int \frac{x^5}{(9-x)^{5/2}}\,dx, x, e^x\right)$$
$$= \text{Subst}\left(\int \left(\frac{59049}{(9-x)^{5/2}} - \frac{32805}{(9-x)^{3/2}} + \frac{7290}{\sqrt{9-x}} - 810\sqrt{9-x} + 45(9-x)^{3/2} - (9-x\right.\right.$$
$$= \frac{39366}{(9-e^x)^{3/2}} - \frac{65610}{\sqrt{9-e^x}} - 14580\sqrt{9-e^x} + 540(9-e^x)^{3/2} - 18(9-e^x)^{5/2} + \frac{2}{7}(9-e^x$$

Mathematica [A]
time = 0.04, size = 48, normalized size = 0.59

$$-\frac{2(5038848 - 839808e^x + 23328e^{2x} + 432e^{3x} + 18e^{4x} + e^{5x})}{7(9-e^x)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(6*x)/(9 - E^x)^(5/2),x]
```

```
[Out] (-2*(5038848 - 839808*E^x + 23328*E^(2*x) + 432*E^(3*x) + 18*E^(4*x) + E^(5
*x)))/(7*(9 - E^x)^(3/2))
```

Maple [A]
time = 0.02, size = 62, normalized size = 0.77

method	result	size
default	$\frac{39366}{(9-e^x)^{\frac{3}{2}}} + 540(9-e^x)^{\frac{3}{2}} - 18(9-e^x)^{\frac{5}{2}} + \frac{2(9-e^x)^{\frac{7}{2}}}{7} - \frac{65610}{\sqrt{9-e^x}} - 14580\sqrt{9-e^x}$	62

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(6*x)/(9-exp(x))^(5/2),x,method=_RETURNVERBOSE)
```

```
[Out] 39366/(9-exp(x))^(3/2)+540*(9-exp(x))^(3/2)-18*(9-exp(x))^(5/2)+2/7*(9-exp(
x))^(7/2)-65610/(9-exp(x))^(1/2)-14580*(9-exp(x))^(1/2)
```

Maxima [A]
time = 0.29, size = 61, normalized size = 0.75

$$\frac{2}{7}(-e^x+9)^{\frac{7}{2}} - 18(-e^x+9)^{\frac{5}{2}} + 540(-e^x+9)^{\frac{3}{2}} - 14580\sqrt{-e^x+9} - \frac{65610}{\sqrt{-e^x+9}} + \frac{39366}{(-e^x+9)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(6*x)/(9-exp(x))^(5/2),x, algorithm="maxima")
```

```
[Out] 2/7*(-e^x + 9)^(7/2) - 18*(-e^x + 9)^(5/2) + 540*(-e^x + 9)^(3/2) - 14580*s
qrt(-e^x + 9) - 65610/sqrt(-e^x + 9) + 39366/(-e^x + 9)^(3/2)
```

Fricas [A]
time = 0.40, size = 50, normalized size = 0.62

$$-\frac{2\left(e^{(5x)}+18e^{(4x)}+432e^{(3x)}+23328e^{(2x)}-839808e^{x}+5038848\right)\sqrt{-e^{x}+9}}{7\left(e^{(2x)}-18e^{x}+81\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(6*x)/(9-exp(x))^(5/2),x, algorithm="fricas")
```

```
[Out] -2/7*(e^(5*x) + 18*e^(4*x) + 432*e^(3*x) + 23328*e^(2*x) - 839808*e^x + 503
8848)*sqrt(-e^x + 9)/(e^(2*x) - 18*e^x + 81)
```

Sympy [A]
time = 13.01, size = 61, normalized size = 0.75

$$\frac{2(9-e^{x})^{\frac{7}{2}}}{7}-18(9-e^{x})^{\frac{5}{2}}+540(9-e^{x})^{\frac{3}{2}}-14580\sqrt{9-e^{x}}-\frac{65610}{\sqrt{9-e^{x}}}+\frac{39366}{(9-e^{x})^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(6*x)/(9-exp(x))**(5/2),x)
```

```
[Out] 2*(9 - exp(x))**(7/2)/7 - 18*(9 - exp(x))**(5/2) + 540*(9 - exp(x))**(3/2)
- 14580*sqrt(9 - exp(x)) - 65610/sqrt(9 - exp(x)) + 39366/(9 - exp(x))**(3/
2)
```

Giac [A]
time = 4.48, size = 75, normalized size = 0.93

$$-\frac{2}{7}\left(e^{x}-9\right)^{3}\sqrt{-e^{x}+9}-18\left(e^{x}-9\right)^{2}\sqrt{-e^{x}+9}+540\left(-e^{x}+9\right)^{\frac{3}{2}}-14580\sqrt{-e^{x}+9}-\frac{13122\left(5e^{x}-42\right)}{\left(e^{x}-9\right)\sqrt{-e^{x}+9}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(6*x)/(9-exp(x))^(5/2),x, algorithm="giac")
```

```
[Out] -2/7*(e^x - 9)^3*sqrt(-e^x + 9) - 18*(e^x - 9)^2*sqrt(-e^x + 9) + 540*(-e^x
 + 9)^(3/2) - 14580*sqrt(-e^x + 9) - 13122*(5*e^x - 42)/((e^x - 9)*sqrt(-e^
x + 9))
```

Mupad [B]
time = 0.19, size = 38, normalized size = 0.47

$$-\frac{2\left(23328\,\mathrm{e}^{2x}+432\,\mathrm{e}^{3x}+18\,\mathrm{e}^{4x}+\mathrm{e}^{5x}-839808\,\mathrm{e}^{x}+5038848\right)}{7\left(9-\mathrm{e}^{x}\right)^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(6*x)/(9 - exp(x))^(5/2),x)
```

```
[Out] -(2*(23328*exp(2*x) + 432*exp(3*x) + 18*exp(4*x) + exp(5*x) - 839808*exp(x)
 + 5038848))/(7*(9 - exp(x))^(3/2))
```

3.712 $\int \left(2-7e^{x^4}\right)^5 x^3\,dx$

Optimal. Leaf size=55

$$-140e^{x^4}+490e^{2x^4}-\frac{3430e^{3x^4}}{3}+\frac{12005e^{4x^4}}{8}-\frac{16807e^{5x^4}}{20}+8x^4$$

```
[Out] -140*exp(x^4)+490*exp(2*x^4)-3430/3*exp(3*x^4)+12005/8*exp(4*x^4)-16807/20*
exp(5*x^4)+8*x^4
```

Rubi [A]
time = 0.06, antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {6847, 2320, 45}

$$8x^4-140e^{x^4}+490e^{2x^4}-\frac{3430e^{3x^4}}{3}+\frac{12005e^{4x^4}}{8}-\frac{16807e^{5x^4}}{20}$$

Antiderivative was successfully verified.

```
[In] Int[(2 - 7*E^x^4)^5*x^3,x]
```

```
[Out] -140*E^x^4 + 490*E^(2*x^4) - (3430*E^(3*x^4))/3 + (12005*E^(4*x^4))/8 - (16
807*E^(5*x^4))/20 + 8*x^4
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6847

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
fQ[x^(m + 1), u, x]
```

Rubi steps

$$\int \left(2-7e^{x^4}\right)^5 x^3\,dx = \frac{1}{4}\text{Subst}\left(\int (2-7e^x)^5\,dx, x, x^4\right)$$
$$= \frac{1}{4}\text{Subst}\left(\int \frac{(2-7x)^5}{x}\,dx, x, e^{x^4}\right)$$
$$= \frac{1}{4}\text{Subst}\left(\int \left(-560+\frac{32}{x}+3920x-13720x^2+24010x^3-16807x^4\right)dx, x, e^{x^4}\right)$$
$$= -140e^{x^4}+490e^{2x^4}-\frac{3430e^{3x^4}}{3}+\frac{12005e^{4x^4}}{8}-\frac{16807e^{5x^4}}{20}+8x^4$$

Mathematica [**A**]
time = 0.03, size = 54, normalized size = 0.98

$$-\frac{7}{120}e^{x^4}\left(2400-8400e^{x^4}+19600e^{2x^4}-25725e^{3x^4}+14406e^{4x^4}\right)+8\log\left(e^{x^4}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(2 - 7*E^x^4)^5*x^3,x]
```

```
[Out] (-7*E^x^4*(2400 - 8400*E^x^4 + 19600*E^(2*x^4) - 25725*E^(3*x^4) + 14406*E^
(4*x^4)))/120 + 8*Log[E^x^4]
```

Maple [**A**]
time = 0.03, size = 47, normalized size = 0.85

method	result	size
norman	$-140\,\mathrm{e}^{x^4}+490\,\mathrm{e}^{2x^4}-\frac{3430\,\mathrm{e}^{3x^4}}{3}+\frac{12005\,\mathrm{e}^{4x^4}}{8}-\frac{16807\,\mathrm{e}^{5x^4}}{20}+8x^4$	45
risch	$-140\,\mathrm{e}^{x^4}+490\,\mathrm{e}^{2x^4}-\frac{3430\,\mathrm{e}^{3x^4}}{3}+\frac{12005\,\mathrm{e}^{4x^4}}{8}-\frac{16807\,\mathrm{e}^{5x^4}}{20}+8x^4$	45
derivativedivides	$-\frac{16807\,\mathrm{e}^{5x^4}}{20}+\frac{12005\,\mathrm{e}^{4x^4}}{8}-\frac{3430\,\mathrm{e}^{3x^4}}{3}+490\,\mathrm{e}^{2x^4}-140\,\mathrm{e}^{x^4}+8\ln\left(\mathrm{e}^{x^4}\right)$	47
default	$-\frac{16807\,\mathrm{e}^{5x^4}}{20}+\frac{12005\,\mathrm{e}^{4x^4}}{8}-\frac{3430\,\mathrm{e}^{3x^4}}{3}+490\,\mathrm{e}^{2x^4}-140\,\mathrm{e}^{x^4}+8\ln\left(\mathrm{e}^{x^4}\right)$	47

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((2-7*exp(x^4))^5*x^3,x,method=_RETURNVERBOSE)
```

```
[Out] -16807/20*exp(x^4)^5+12005/8*exp(x^4)^4-3430/3*exp(x^4)^3+490*exp(x^4)^2-14
0*exp(x^4)+8*ln(exp(x^4))
```

Maxima [**A**]
time = 0.28, size = 44, normalized size = 0.80

$$8\,x^4-\frac{16807}{20}\,e^{\left(5\,x^4\right)}+\frac{12005}{8}\,e^{\left(4\,x^4\right)}-\frac{3430}{3}\,e^{\left(3\,x^4\right)}+490\,e^{\left(2\,x^4\right)}-140\,e^{\left(x^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-7*exp(x^4))^5*x^3,x, algorithm="maxima")
```

```
[Out] 8*x^4 - 16807/20*e^(5*x^4) + 12005/8*e^(4*x^4) - 3430/3*e^(3*x^4) + 490*e^(
2*x^4) - 140*e^(x^4)
```

Fricas [A]
time = 0.39, size = 44, normalized size = 0.80

$$8\,x^4 - \frac{16807}{20}\,e^{\left(5\,x^4\right)} + \frac{12005}{8}\,e^{\left(4\,x^4\right)} - \frac{3430}{3}\,e^{\left(3\,x^4\right)} + 490\,e^{\left(2\,x^4\right)} - 140\,e^{\left(x^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-7*exp(x^4))^5*x^3,x, algorithm="fricas")
```

```
[Out] 8*x^4 - 16807/20*e^(5*x^4) + 12005/8*e^(4*x^4) - 3430/3*e^(3*x^4) + 490*e^(
2*x^4) - 140*e^(x^4)
```

Sympy [A]
time = 0.05, size = 49, normalized size = 0.89

$$8x^4 - \frac{16807e^{5x^4}}{20} + \frac{12005e^{4x^4}}{8} - \frac{3430e^{3x^4}}{3} + 490e^{2x^4} - 140e^{x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-7*exp(x**4))**5*x**3,x)
```

```
[Out] 8*x**4 - 16807*exp(5*x**4)/20 + 12005*exp(4*x**4)/8 - 3430*exp(3*x**4)/3 +
490*exp(2*x**4) - 140*exp(x**4)
```

Giac [A]
time = 4.68, size = 44, normalized size = 0.80

$$8\,x^4 - \frac{16807}{20}\,e^{\left(5\,x^4\right)} + \frac{12005}{8}\,e^{\left(4\,x^4\right)} - \frac{3430}{3}\,e^{\left(3\,x^4\right)} + 490\,e^{\left(2\,x^4\right)} - 140\,e^{\left(x^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-7*exp(x^4))^5*x^3,x, algorithm="giac")
```

```
[Out] 8*x^4 - 16807/20*e^(5*x^4) + 12005/8*e^(4*x^4) - 3430/3*e^(3*x^4) + 490*e^(
2*x^4) - 140*e^(x^4)
```

Mupad [B]
time = 3.57, size = 44, normalized size = 0.80

$$490\,\mathrm{e}^{2\,x^4} - 140\,\mathrm{e}^{x^4} - \frac{3430\,\mathrm{e}^{3\,x^4}}{3} + \frac{12005\,\mathrm{e}^{4\,x^4}}{8} - \frac{16807\,\mathrm{e}^{5\,x^4}}{20} + 8\,x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-x^3*(7*exp(x^4) - 2)^5,x)
```

```
[Out] 490*exp(2*x^4) - 140*exp(x^4) - (3430*exp(3*x^4))/3 + (12005*exp(4*x^4))/8
- (16807*exp(5*x^4))/20 + 8*x^4
```

3.713 $\int e^{x^2} \sqrt{1 - e^{2x^2}}\, x\, dx$

Optimal. Leaf size=35

$$\frac{1}{4} e^{x^2} \sqrt{1 - e^{2x^2}} + \frac{1}{4} \sin^{-1}\left(e^{x^2}\right)$$

```
[Out] 1/4*arcsin(exp(x^2))+1/4*exp(x^2)*(1-exp(2*x^2))^(1/2)
```

Rubi [A]
time = 0.11, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = {6847, 2281, 201, 222}

$$\frac{1}{4} \text{ArcSin}\left(e^{x^2}\right) + \frac{1}{4} e^{x^2} \sqrt{1 - e^{2x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[E^x^2*Sqrt[1 - E^(2*x^2)]*x,x]
```

```
[Out] (E^x^2*Sqrt[1 - E^(2*x^2)])/4 + ArcSin[E^x^2]/4
```

Rule 201

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^p/(n*p
+ 1)), x] + Dist[a*n*(p/(n*p + 1)), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 222

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 6847

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
```

```
fQ[x^(m + 1), u, x]
```

Rubi steps

$$
\begin{aligned}
\int e^{x^2}\sqrt{1-e^{2x^2}}\,x\,dx &= \frac{1}{2}\text{Subst}\left(\int e^{x}\sqrt{1-e^{2x}}\,dx,x,x^2\right)\\
&= \frac{1}{2}\text{Subst}\left(\int \sqrt{1-x^2}\,dx,x,e^{x^2}\right)\\
&= \frac{1}{4}e^{x^2}\sqrt{1-e^{2x^2}}+\frac{1}{4}\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx,x,e^{x^2}\right)\\
&= \frac{1}{4}e^{x^2}\sqrt{1-e^{2x^2}}+\frac{1}{4}\sin^{-1}\left(e^{x^2}\right)
\end{aligned}
$$

Mathematica [A]
time = 0.07, size = 55, normalized size = 1.57

$$\frac{1}{4}e^{x^2}\sqrt{1-e^{2x^2}}-\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{1-e^{2x^2}}}{1+e^{x^2}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x^2*Sqrt[1 - E^(2*x^2)]*x,x]
[Out] (E^x^2*Sqrt[1 - E^(2*x^2)])/4 - ArcTan[Sqrt[1 - E^(2*x^2)]/(1 + E^x^2)]/2
```

Maple [A]
time = 0.04, size = 27, normalized size = 0.77

method	result	size
derivativedivides	$\frac{\arcsin\left(e^{x^2}\right)}{4}+\frac{e^{x^2}\sqrt{1-e^{2x^2}}}{4}$	27
default	$\frac{\arcsin\left(e^{x^2}\right)}{4}+\frac{e^{x^2}\sqrt{1-e^{2x^2}}}{4}$	27
risch	$-\frac{e^{x^2}\left(-1+e^{2x^2}\right)}{4\sqrt{1-e^{2x^2}}}+\frac{\arcsin\left(e^{x^2}\right)}{4}$	35

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^2)*x*(1-exp(2*x^2))^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/4*exp(x^2)*(1-exp(x^2)^2)^(1/2)+1/4*arcsin(exp(x^2))
```

Maxima [A]
time = 0.54, size = 26, normalized size = 0.74

$$\frac{1}{4}\sqrt{-e^{(2x^2)}+1}\,e^{(x^2)}+\frac{1}{4}\arcsin\left(e^{(x^2)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*x*(1-exp(2*x^2))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/4*sqrt(-e^(2*x^2) + 1)*e^(x^2) + 1/4*arcsin(e^(x^2))
```

Fricas [A]
time = 0.36, size = 43, normalized size = 1.23

$$\frac{1}{4}\sqrt{-e^{(2x^2)}+1}\,e^{(x^2)}-\frac{1}{2}\arctan\left(\left(\sqrt{-e^{(2x^2)}+1}-1\right)e^{(-x^2)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*x*(1-exp(2*x^2))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/4*sqrt(-e^(2*x^2) + 1)*e^(x^2) - 1/2*arctan((sqrt(-e^(2*x^2) + 1) - 1)*e^
(-x^2))
```

Sympy [A]
time = 17.33, size = 39, normalized size = 1.11

$$\frac{\begin{cases}\frac{\sqrt{1-e^{2x^2}}\,e^{x^2}}{2}+\frac{\operatorname{asin}\left(e^{x^2}\right)}{2} & \text{for}\ e^{x^2}>-1\wedge e^{x^2}<1\end{cases}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**2)*x*(1-exp(2*x**2))**(1/2),x)
```

```
[Out] Piecewise((sqrt(1 - exp(2*x**2))*exp(x**2)/2 + asin(exp(x**2))/2, (exp(x**2
) > -1) & (exp(x**2) < 1)))/2
```

Giac [A]
time = 4.54, size = 26, normalized size = 0.74

$$\frac{1}{4}\sqrt{-e^{(2x^2)}+1}\,e^{(x^2)}+\frac{1}{4}\arcsin\left(e^{(x^2)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*x*(1-exp(2*x^2))^(1/2),x, algorithm="giac")
```

```
[Out] 1/4*sqrt(-e^(2*x^2) + 1)*e^(x^2) + 1/4*arcsin(e^(x^2))
```

Mupad [B]
time = 3.65, size = 26, normalized size = 0.74

$$\frac{\operatorname{asin}\left(\mathrm{e}^{x^2}\right)}{4}+\frac{\mathrm{e}^{x^2}\,\sqrt{1-\mathrm{e}^{2\,x^2}}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*exp(x^2)*(1 - exp(2*x^2))^(1/2),x)
```

```
[Out] asin(exp(x^2))/4 + (exp(x^2)*(1 - exp(2*x^2))^(1/2))/4
```

3.714 $\int e^{x^3} \left(1-e^{4 x^3}\right)^2 x^2 \, dx$

Optimal. Leaf size=32

$$\frac{e^{x^3}}{3}-\frac{2 e^{5 x^3}}{15}+\frac{e^{9 x^3}}{27}$$

```
[Out] 1/3*exp(x^3)-2/15*exp(5*x^3)+1/27*exp(9*x^3)
```

Rubi [A]
time = 0.14, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {6847, 2281, 200}

$$\frac{e^{x^3}}{3}-\frac{2 e^{5 x^3}}{15}+\frac{e^{9 x^3}}{27}$$

Antiderivative was successfully verified.

```
[In] Int[E^x^3*(1 - E^(4*x^3))^2*x^2,x]
```

```
[Out] E^x^3/3 - (2*E^(5*x^3))/15 + E^(9*x^3)/27
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 2281

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[d*e*(Log[F]/(g*h*Log
[G]))]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - d*e*(f/g))*x^Numerator[m])^p, x], x, G^(h*((f + g*x)/Denom
inator[m]))], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 6847

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
fQ[x^(m + 1), u, x]
```

Rubi steps

$$\int e^{x^3}\left(1-e^{4x^3}\right)^2 x^2\,dx = \frac{1}{3}\text{Subst}\left(\int e^x\left(1-e^{4x}\right)^2\,dx,x,x^3\right)$$
$$= \frac{1}{3}\text{Subst}\left(\int \left(1-x^4\right)^2\,dx,x,e^{x^3}\right)$$
$$= \frac{1}{3}\text{Subst}\left(\int \left(1-2x^4+x^8\right)\,dx,x,e^{x^3}\right)$$
$$= \frac{e^{x^3}}{3}-\frac{2e^{5x^3}}{15}+\frac{e^{9x^3}}{27}$$

Mathematica [A]
time = 0.05, size = 29, normalized size = 0.91

$$\frac{1}{135}e^{x^3}\left(45-18e^{4x^3}+5e^{8x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x^3*(1 - E^(4*x^3))^2*x^2,x]
```

```
[Out] (E^x^3*(45 - 18*E^(4*x^3) + 5*E^(8*x^3)))/135
```

Maple [A]
time = 0.02, size = 24, normalized size = 0.75

method	result	size
derivativedivides	$\frac{e^{x^3}}{3}-\frac{2\,e^{5x^3}}{15}+\frac{e^{9x^3}}{27}$	24
default	$\frac{e^{x^3}}{3}-\frac{2\,e^{5x^3}}{15}+\frac{e^{9x^3}}{27}$	24
risch	$\frac{e^{x^3}}{3}-\frac{2\,e^{5x^3}}{15}+\frac{e^{9x^3}}{27}$	24
meijerg	$-\frac{32}{135}+\frac{e^{x^3}}{3}-\frac{2\,e^{5x^3}}{15}+\frac{e^{9x^3}}{27}$	25

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^3)*(1-exp(4*x^3))^2*x^2,x,method=_RETURNVERBOSE)
```

```
[Out] 1/27*exp(x^3)^9-2/15*exp(x^3)^5+1/3*exp(x^3)
```

Maxima [A]
time = 0.29, size = 23, normalized size = 0.72

$$\frac{1}{27}\,e^{\left(9\,x^3\right)}-\frac{2}{15}\,e^{\left(5\,x^3\right)}+\frac{1}{3}\,e^{\left(x^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^3)*(1-exp(4*x^3))^2*x^2,x, algorithm="maxima")
```

```
[Out] 1/27*e^(9*x^3) - 2/15*e^(5*x^3) + 1/3*e^(x^3)
```

Fricas [A]
time = 0.35, size = 23, normalized size = 0.72

$$\frac{1}{27}\,e^{\left(9\,x^{3}\right)}-\frac{2}{15}\,e^{\left(5\,x^{3}\right)}+\frac{1}{3}\,e^{\left(x^{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^3)*(1-exp(4*x^3))^2*x^2,x, algorithm="fricas")
```

```
[Out] 1/27*e^(9*x^3) - 2/15*e^(5*x^3) + 1/3*e^(x^3)
```

Sympy [A]
time = 0.05, size = 24, normalized size = 0.75

$$\frac{e^{9x^{3}}}{27}-\frac{2e^{5x^{3}}}{15}+\frac{e^{x^{3}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**3)*(1-exp(4*x**3))**2*x**2,x)
```

```
[Out] exp(9*x**3)/27 - 2*exp(5*x**3)/15 + exp(x**3)/3
```

Giac [A]
time = 3.21, size = 23, normalized size = 0.72

$$\frac{1}{27}\,e^{\left(9\,x^{3}\right)}-\frac{2}{15}\,e^{\left(5\,x^{3}\right)}+\frac{1}{3}\,e^{\left(x^{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^3)*(1-exp(4*x^3))^2*x^2,x, algorithm="giac")
```

```
[Out] 1/27*e^(9*x^3) - 2/15*e^(5*x^3) + 1/3*e^(x^3)
```

Mupad [B]
time = 3.61, size = 24, normalized size = 0.75

$$\frac{e^{x^{3}}\,\left(5\,e^{8\,x^{3}}-18\,e^{4\,x^{3}}+45\right)}{135}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*exp(x^3)*(exp(4*x^3) - 1)^2,x)
```

```
[Out] (exp(x^3)*(5*exp(8*x^3) - 18*exp(4*x^3) + 45))/135
```

3.715 $\int e^{e^x+x}\,dx$

Optimal. Leaf size=5

$$e^{e^x}$$

[Out] exp(exp(x))

Rubi [A]
time = 0.00, antiderivative size = 5, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {2320, 2225}

$$e^{e^x}$$

Antiderivative was successfully verified.

[In] Int[E^(E^x + x),x]

[Out] E^E^x

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned} \int e^{e^x+x}\,dx &= \text{Subst}\left(\int e^x\,dx, x, e^x\right)\\ &= e^{e^x} \end{aligned}$$

Mathematica [A]
time = 0.00, size = 5, normalized size = 1.00

$$e^{e^x}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(E^x + x),x]
```

```
[Out] E^E^x
```

Maple [A]
time = 0.01, size = 4, normalized size = 0.80

method	result	size
default	$e^{e^{x}}$	4
risch	$e^{e^{x}}$	4

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(exp(x)+x),x,method=_RETURNVERBOSE)
```

```
[Out] exp(exp(x))
```

Maxima [A]
time = 0.29, size = 3, normalized size = 0.60

$$e^{\left(e^{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(exp(x)+x),x, algorithm="maxima")
```

```
[Out] e^(e^x)
```

Fricas [A]
time = 0.36, size = 3, normalized size = 0.60

$$e^{\left(e^{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(exp(x)+x),x, algorithm="fricas")
```

```
[Out] e^(e^x)
```

Sympy [A]
time = 0.32, size = 3, normalized size = 0.60

$$e^{e^{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(exp(x)+x),x)
```

```
[Out] exp(exp(x))
```

Giac [A]
time = 4.29, size = 3, normalized size = 0.60

$$e^{(e^x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(exp(x)+x),x, algorithm="giac")
```

```
[Out] e^(e^x)
```

Mupad [B]
time = 0.03, size = 3, normalized size = 0.60

$$e^{e^x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x + exp(x)),x)
```

```
[Out] exp(exp(x))
```

3.716 $\int e^{e^{e^x}+e^x+x}\,dx$

Optimal. Leaf size=7

$$e^{e^{e^x}}$$

[Out] exp(exp(exp(x)))

Rubi [A]
time = 0.01, antiderivative size = 7, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {2320, 2225}

$$e^{e^{e^x}}$$

Antiderivative was successfully verified.

[In] Int[E^(E^E^x + E^x + x),x]

[Out] E^E^E^x

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int e^{e^{e^x}+e^x+x}\,dx &= \text{Subst}\left(\int e^{e^x+x}\,dx,x,e^x\right)\\ &= \text{Subst}\left(\int e^x\,dx,x,e^{e^x}\right)\\ &= e^{e^{e^x}}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 7, normalized size = 1.00

$$e^{e^{e^x}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(E^E^x + E^x + x),x]
```

```
[Out] E^E^E^x
```

Maple [A]
time = 0.02, size = 5, normalized size = 0.71

method	result	size
default	$e^{e^{e^x}}$	5
risch	$e^{e^{e^x}}$	5

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(exp(exp(x))+exp(x)+x),x,method=_RETURNVERBOSE)
```

```
[Out] exp(exp(exp(x)))
```

Maxima [A]
time = 0.30, size = 4, normalized size = 0.57

$$e^{\left(e^{\left(e^x\right)}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(exp(exp(x))+exp(x)+x),x, algorithm="maxima")
```

```
[Out] e^(e^(e^x))
```

Fricas [A]
time = 0.37, size = 4, normalized size = 0.57

$$e^{\left(e^{\left(e^x\right)}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(exp(exp(x))+exp(x)+x),x, algorithm="fricas")
```

```
[Out] e^(e^(e^x))
```

Sympy [A]
time = 0.47, size = 5, normalized size = 0.71

$$e^{e^{e^x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(exp(exp(x))+exp(x)+x),x)
```

```
[Out] exp(exp(exp(x)))
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(exp(exp(x))+exp(x)+x),x, algorithm="giac")
[Out] integrate(e^(x + e^x + e^(e^x)), x)
```

Mupad [**B**]
time = 3.46, size = 4, normalized size = 0.57

$$e^{e^{e^x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x + exp(exp(x)) + exp(x)),x)
[Out] exp(exp(exp(x)))
```

3.717 $\int (e^{-x}+e^x)^2 \, dx$

Optimal. Leaf size=22

$$-\frac{1}{2}e^{-2x}+\frac{e^{2x}}{2}+2x$$

[Out] -1/2/exp(2*x)+1/2*exp(2*x)+2*x

Rubi [A]
time = 0.01, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.273$, Rules used = {2320, 272, 45}

$$2x-\frac{e^{-2x}}{2}+\frac{e^{2x}}{2}$$

Antiderivative was successfully verified.

[In] Int[(E^(-x) + E^x)^2,x]

[Out] -1/2*1/E^(2*x) + E^(2*x)/2 + 2*x

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \left(e^{-x}+e^x\right)^2 dx = \text{Subst}\left(\int \frac{\left(1+x^2\right)^2}{x^3} dx, x, e^x\right)$$
$$= \frac{1}{2}\text{Subst}\left(\int \frac{(1+x)^2}{x^2} dx, x, e^{2x}\right)$$
$$= \frac{1}{2}\text{Subst}\left(\int \left(1+\frac{1}{x^2}+\frac{2}{x}\right) dx, x, e^{2x}\right)$$
$$= -\frac{1}{2}e^{-2x}+\frac{e^{2x}}{2}+2x$$

Mathematica [A]
time = 0.02, size = 23, normalized size = 1.05

$$\frac{1}{2}e^{-2x}\left(-1+e^{4x}\right)+\log\left(e^{2x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(-x) + E^x)^2,x]
```

```
[Out] (-1 + E^(4*x))/(2*E^(2*x)) + Log[E^(2*x)]
```

Maple [A]
time = 0.01, size = 17, normalized size = 0.77

method	result	size
default	$2x-\frac{e^{-2x}}{2}+\frac{e^{2x}}{2}$	17
risch	$2x-\frac{e^{-2x}}{2}+\frac{e^{2x}}{2}$	17
norman	$\left(-\frac{1}{2}+\frac{e^{4x}}{2}+2x\,e^{2x}\right)e^{-2x}$	21

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(-x)+exp(x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] 2*x-1/2/exp(x)^2+1/2*exp(x)^2
```

Maxima [A]
time = 0.30, size = 16, normalized size = 0.73

$$2\,x+\frac{1}{2}\,e^{(2\,x)}-\frac{1}{2}\,e^{(-2\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-x)+exp(x))^2,x, algorithm="maxima")
[Out] 2*x + 1/2*e^(2*x) - 1/2*e^(-2*x)
```

Fricas [A]
time = 0.36, size = 19, normalized size = 0.86

$$\frac{1}{2}\left(4\,xe^{(2\,x)}+e^{(4\,x)}-1\right)e^{(-2\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-x)+exp(x))^2,x, algorithm="fricas")
[Out] 1/2*(4*x*e^(2*x) + e^(4*x) - 1)*e^(-2*x)
```

Sympy [A]
time = 0.03, size = 17, normalized size = 0.77

$$2x+\frac{e^{2x}}{2}-\frac{e^{-2x}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-x)+exp(x))**2,x)
[Out] 2*x + exp(2*x)/2 - exp(-2*x)/2
```

Giac [A]
time = 4.90, size = 24, normalized size = 1.09

$$-\frac{1}{2}\left(2\,e^{(2\,x)}+1\right)e^{(-2\,x)}+2\,x+\frac{1}{2}\,e^{(2\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-x)+exp(x))^2,x, algorithm="giac")
[Out] -1/2*(2*e^(2*x) + 1)*e^(-2*x) + 2*x + 1/2*e^(2*x)
```

Mupad [B]
time = 3.58, size = 8, normalized size = 0.36

$$2\,x+\sinh(2\,x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(-x) + exp(x))^2,x)
[Out] 2*x + sinh(2*x)
```

3.718 $\int \frac{1}{e^{-x}+e^x} dx$

Optimal. Leaf size=4

$$\tan^{-1}(e^x)$$

```
[Out] arctan(exp(x))
```

Rubi [A]
time = 0.01, antiderivative size = 4, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = {2320, 209}

$$\text{ArcTan}(e^x)$$

Antiderivative was successfully verified.

```
[In] Int[(E^(-x) + E^x)^(-1),x]
```

```
[Out] ArcTan[E^x]
```

Rule 209

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[b, 2]))*A
rcTan[Rt[b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{e^{-x}+e^x} dx &= \text{Subst}\left(\int \frac{1}{1+x^2} dx, x, e^x\right)\\ &= \tan^{-1}(e^x)\end{aligned}$$

Mathematica [A]
time = 0.00, size = 4, normalized size = 1.00

$$\tan^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(-x) + E^x)^(-1),x]
```

```
[Out] ArcTan[E^x]
```

Maple [A]
time = 0.02, size = 4, normalized size = 1.00

method	result	size
default	$\arctan\left(\mathrm{e}^{x}\right)$	4
risch	$\frac{i\ln(\mathrm{e}^{x}+i)}{2}-\frac{i\ln(\mathrm{e}^{x}-i)}{2}$	20

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(exp(-x)+exp(x)),x,method=_RETURNVERBOSE)
```

```
[Out] arctan(exp(x))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 7 vs. $2(3) = 6$.
time = 0.52, size = 7, normalized size = 1.75

$$-\arctan\left(e^{(-x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(exp(-x)+exp(x)),x, algorithm="maxima")
```

```
[Out] -arctan(e^(-x))
```

Fricas [A]
time = 0.36, size = 3, normalized size = 0.75

$$\arctan\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(exp(-x)+exp(x)),x, algorithm="fricas")
```

```
[Out] arctan(e^x)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 15 vs. $2(3) = 6$.
time = 0.03, size = 15, normalized size = 3.75

$$\operatorname{RootSum}\left(4z^{2}+1,\left(i\mapsto i\log\left(2i+e^{x}\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(exp(-x)+exp(x)),x)
```

```
[Out] RootSum(4*_z**2 + 1, Lambda(_i, _i*log(2*_i + exp(x))))
```

Giac [A]
time = 5.94, size = 3, normalized size = 0.75

$$\arctan(e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(exp(-x)+exp(x)),x, algorithm="giac")
```

```
[Out] arctan(e^x)
```

Mupad [B]
time = 0.02, size = 3, normalized size = 0.75

$$\mathrm{atan}(\mathrm{e}^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(exp(-x) + exp(x)),x)
```

```
[Out] atan(exp(x))
```

3.719 $\int \frac{1}{(e^{-x}+e^x)^2}\,dx$

Optimal. Leaf size=13

$$-\frac{1}{2\,(1+e^{2x})}$$

[Out] -1/2/(1+exp(2*x))

Rubi [A]

time = 0.01, antiderivative size = 13, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = {2320, 267}

$$-\frac{1}{2\,(e^{2x}+1)}$$

Antiderivative was successfully verified.

[In] Int[(E^(-x) + E^x)^(-2),x]

[Out] -1/2*1/(1 + E^(2*x))

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{(e^{-x}+e^x)^2}\,dx &= \text{Subst}\left(\int \frac{x}{(1+x^2)^2}\,dx, x, e^x\right)\\ &= -\frac{1}{2\,(1+e^{2x})}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 13, normalized size = 1.00

$$-\frac{1}{2+2e^{2x}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(-x) + E^x)^(-2),x]
[Out] -(2 + 2*E^(2*x))^(-1)
```

Maple [A]
time = 0.01, size = 11, normalized size = 0.85

method	result	size
default	$-\frac{1}{2(1+e^{2x})}$	11
norman	$-\frac{1}{2(1+e^{2x})}$	11
risch	$-\frac{1}{2(1+e^{2x})}$	11

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(exp(-x)+exp(x))^2,x,method=_RETURNVERBOSE)
[Out] -1/2/(1+exp(x)^2)
```

Maxima [A]
time = 0.28, size = 10, normalized size = 0.77

$$\frac{1}{2\left(e^{(-2x)}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(exp(-x)+exp(x))^2,x, algorithm="maxima")
[Out] 1/2/(e^(-2*x) + 1)
```

Fricas [A]
time = 0.36, size = 10, normalized size = 0.77

$$-\frac{1}{2\left(e^{(2x)}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(exp(-x)+exp(x))^2,x, algorithm="fricas")
[Out] -1/2/(e^(2*x) + 1)
```

Sympy [A]
time = 0.02, size = 10, normalized size = 0.77

$$-\frac{1}{2e^{2x}+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(exp(-x)+exp(x))**2,x)
```

```
[Out] -1/(2*exp(2*x) + 2)
```

Giac [A]
time = 5.06, size = 10, normalized size = 0.77

$$-\frac{1}{2\left(e^{(2x)}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(exp(-x)+exp(x))^2,x, algorithm="giac")
```

```
[Out] -1/2/(e^(2*x) + 1)
```

Mupad [B]
time = 0.07, size = 12, normalized size = 0.92

$$-\frac{1}{2\left(e^{2x}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(exp(-x) + exp(x))^2,x)
```

```
[Out] -1/(2*(exp(2*x) + 1))
```

3.720 $\int \frac{1}{-e^{-x}+e^x} \, dx$

Optimal. Leaf size=6

$$-\tanh^{-1}(e^x)$$

[Out] -arctanh(exp(x))

Rubi [A]
time = 0.01, antiderivative size = 6, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2320, 213}

$$-\tanh^{-1}(e^x)$$

Antiderivative was successfully verified.

[In] Int[(-E^(-x) + E^x)^(-1),x]

[Out] -ArcTanh[E^x]

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned} \int \frac{1}{-e^{-x}+e^x} \, dx &= \text{Subst}\left(\int \frac{1}{-1+x^2} \, dx, x, e^x\right) \\ &= -\tanh^{-1}(e^x) \end{aligned}$$

Mathematica [A]
time = 0.00, size = 6, normalized size = 1.00

$$-\tanh^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[(-E^(-x) + E^x)^(-1),x]
[Out] -ArcTanh[E^x]
```

Maple [A]
time = 0.01, size = 6, normalized size = 1.00

method	result	size
derivativedivides	$-\operatorname{arctanh}\left(e^{x}\right)$	6
default	$-\operatorname{arctanh}\left(e^{x}\right)$	6
norman	$\frac{\ln\left(-1+e^{x}\right)}{2}-\frac{\ln\left(1+e^{x}\right)}{2}$	16
risch	$\frac{\ln\left(-1+e^{x}\right)}{2}-\frac{\ln\left(1+e^{x}\right)}{2}$	16

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-1/exp(x)+exp(x)),x,method=_RETURNVERBOSE)
[Out] -arctanh(exp(x))
```

Maxima [B] Leaf count of result is larger than twice the leaf count of optimal. 19 vs. $2(5) = 10$.
time = 0.28, size = 19, normalized size = 3.17

$$-\frac{1}{2}\log\left(e^{(-x)}+1\right)+\frac{1}{2}\log\left(e^{(-x)}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-1/exp(x)+exp(x)),x, algorithm="maxima")
[Out] -1/2*log(e^(-x) + 1) + 1/2*log(e^(-x) - 1)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 15 vs. $2(5) = 10$.
time = 0.39, size = 15, normalized size = 2.50

$$-\frac{1}{2}\log\left(e^{x}+1\right)+\frac{1}{2}\log\left(e^{x}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-1/exp(x)+exp(x)),x, algorithm="fricas")
[Out] -1/2*log(e^x + 1) + 1/2*log(e^x - 1)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 15 vs. $2(5) = 10$.
time = 0.03, size = 15, normalized size = 2.50

$$\frac{\log\left(e^{x}-1\right)}{2}-\frac{\log\left(e^{x}+1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-1/exp(x)+exp(x)),x)
```

```
[Out] log(exp(x) - 1)/2 - log(exp(x) + 1)/2
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 16 vs. $2(5) = 10$.
time = 5.44, size = 16, normalized size = 2.67

$$-\frac{1}{2}\log\left(e^{x}+1\right)+\frac{1}{2}\log\left(\left|e^{x}-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-1/exp(x)+exp(x)),x, algorithm="giac")
```

```
[Out] -1/2*log(e^x + 1) + 1/2*log(abs(e^x - 1))
```

Mupad [B]
time = 0.05, size = 15, normalized size = 2.50

$$\frac{\ln\left(\mathrm{e}^{x}-1\right)}{2}-\frac{\ln\left(\mathrm{e}^{x}+1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-1/(exp(-x) - exp(x)),x)
```

```
[Out] log(exp(x) - 1)/2 - log(exp(x) + 1)/2
```

3.721 $\int \frac{1}{(-e^{-x}+e^x)^2}\,dx$

Optimal. Leaf size=15

$$\frac{1}{2(1-e^{2x})}$$

```
[Out] 1/2/(1-exp(2*x))
```

Rubi [A]
time = 0.01, antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2320, 267}

$$\frac{1}{2(1-e^{2x})}$$

Antiderivative was successfully verified.

```
[In] Int[(-E^(-x) + E^x)^(-2),x]
```

```
[Out] 1/(2*(1 - E^(2*x)))
```

Rule 267

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{(-e^{-x}+e^x)^2}\,dx &= \text{Subst}\left(\int \frac{x}{(1-x^2)^2}\,dx, x, e^x\right)\\ &= \frac{1}{2(1-e^{2x})}\end{aligned}$$

Mathematica [A]
time = 0.03, size = 11, normalized size = 0.73

$$\frac{1}{2-2e^{2x}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(-E^(-x) + E^x)^(-2),x]
[Out] (2 - 2*E^(2*x))^(-1)
```

Maple [A]
time = 0.01, size = 11, normalized size = 0.73

method	result	size
derivativedivides	$-\frac{1}{2(-1+e^{2x})}$	11
default	$-\frac{1}{2(-1+e^{2x})}$	11
norman	$-\frac{1}{2(-1+e^{2x})}$	11
risch	$-\frac{1}{2(-1+e^{2x})}$	11

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-1/exp(x)+exp(x))^2,x,method=_RETURNVERBOSE)
[Out] -1/2/(exp(x)^2-1)
```

Maxima [A]
time = 0.28, size = 10, normalized size = 0.67

$$\frac{1}{2\left(e^{(-2x)}-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-1/exp(x)+exp(x))^2,x, algorithm="maxima")
[Out] 1/2/(e^(-2*x) - 1)
```

Fricas [A]
time = 0.38, size = 10, normalized size = 0.67

$$-\frac{1}{2\left(e^{(2x)}-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-1/exp(x)+exp(x))^2,x, algorithm="fricas")
```

```
[Out] -1/2/(e^(2*x) - 1)
```

Sympy [A]
time = 0.02, size = 10, normalized size = 0.67

$$-\frac{1}{2e^{2x}-2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-1/exp(x)+exp(x))**2,x)
```

```
[Out] -1/(2*exp(2*x) - 2)
```

Giac [A]
time = 3.52, size = 10, normalized size = 0.67

$$-\frac{1}{2\left(e^{(2x)}-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-1/exp(x)+exp(x))^2,x, algorithm="giac")
```

```
[Out] -1/2/(e^(2*x) - 1)
```

Mupad [B]
time = 3.40, size = 12, normalized size = 0.80

$$-\frac{1}{2\left(\mathrm{e}^{2x}-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(exp(-x) - exp(x))^2,x)
```

```
[Out] -1/(2*(exp(2*x) - 1))
```

3.722 $\int e^x(-e^{-x}+e^x)^2\,dx$

Optimal. Leaf size=22

$$-e^{-x}-2e^x+\frac{e^{3x}}{3}$$

[Out] -1/exp(x)-2*exp(x)+1/3*exp(3*x)

Rubi [A]
time = 0.02, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}=0.118$, Rules used = {2320, 14}

$$-e^{-x}-2e^x+\frac{e^{3x}}{3}$$

Antiderivative was successfully verified.

[In] Int[E^x*(-E^(-x) + E^x)^2,x]

[Out] -E^(-x) - 2*E^x + E^(3*x)/3

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int e^x\left(-e^{-x}+e^x\right)^2\,dx&=\text{Subst}\left(\int\frac{\frac{1}{x}-2x+x^3}{x}\,dx,x,e^x\right)\\&=\text{Subst}\left(\int\left(-2+\frac{1}{x^2}+x^2\right)\,dx,x,e^x\right)\\&=-e^{-x}-2e^x+\frac{e^{3x}}{3}\end{aligned}$$

Mathematica [A]
time = 0.02, size = 23, normalized size = 1.05

$$\frac{1}{3}e^{-x}\left(-3-6e^{2x}+e^{4x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*(-E^(-x) + E^x)^2,x]
[Out] (-3 - 6*E^(2*x) + E^(4*x))/(3*E^x)
```

Maple [A]
time = 0.02, size = 18, normalized size = 0.82

method	result	size
derivativedivides	$\frac{e^{3x}}{3}-2\,e^{x}-e^{-x}$	18
default	$\frac{e^{3x}}{3}-2\,e^{x}-e^{-x}$	18
risch	$\frac{e^{3x}}{3}-2\,e^{x}-e^{-x}$	18
meijerg	$\frac{8}{3}-e^{-x}-2\,e^{x}+\frac{e^{3x}}{3}$	19
norman	$\left(-2\,e^{3x}+\frac{e^{5x}}{3}-e^{x}\right)e^{-2x}$	23

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(-1/exp(x)+exp(x))^2,x,method=_RETURNVERBOSE)
[Out] 1/3*exp(x)^3-2*exp(x)-1/exp(x)
```

Maxima [A]
time = 0.29, size = 21, normalized size = 0.95

$$-\frac{1}{3}\left(6\,e^{(-2\,x)}-1\right)e^{(3\,x)}-e^{(-x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-1/exp(x)+exp(x))^2,x, algorithm="maxima")
[Out] -1/3*(6*e^(-2*x) - 1)*e^(3*x) - e^(-x)
```

Fricas [A]
time = 0.36, size = 18, normalized size = 0.82

$$\frac{1}{3}\left(e^{(4\,x)}-6\,e^{(2\,x)}-3\right)e^{(-x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-1/exp(x)+exp(x))^2,x, algorithm="fricas")
```

```
[Out] 1/3*(e^(4*x) - 6*e^(2*x) - 3)*e^(-x)
```

Sympy [A]
time = 0.04, size = 15, normalized size = 0.68

$$\frac{e^{3x}}{3} - 2e^{x} - e^{-x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-1/exp(x)+exp(x))**2,x)
```

```
[Out] exp(3*x)/3 - 2*exp(x) - exp(-x)
```

Giac [A]
time = 3.76, size = 17, normalized size = 0.77

$$\frac{1}{3} e^{(3x)} - e^{(-x)} - 2e^{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-1/exp(x)+exp(x))^2,x, algorithm="giac")
```

```
[Out] 1/3*e^(3*x) - e^(-x) - 2*e^x
```

Mupad [B]
time = 0.06, size = 17, normalized size = 0.77

$$\frac{\mathrm{e}^{3x}}{3} - \mathrm{e}^{-x} - 2\,\mathrm{e}^{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(exp(-x) - exp(x))^2,x)
```

```
[Out] exp(3*x)/3 - exp(-x) - 2*exp(x)
```

3.723 $\int e^x(-e^{-x}+e^x)^3\,dx$

Optimal. Leaf size=31

$$\frac{e^{-2x}}{2}-\frac{3e^{2x}}{2}+\frac{e^{4x}}{4}+3x$$

```
[Out] 1/2/exp(2*x)-3/2*exp(2*x)+1/4*exp(4*x)+3*x
```

Rubi [A]
time = 0.02, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}=0.176$, Rules used = {2320, 272, 45}

$$3x+\frac{e^{-2x}}{2}-\frac{3e^{2x}}{2}+\frac{e^{4x}}{4}$$

Antiderivative was successfully verified.

```
[In] Int[E^x*(-E^(-x) + E^x)^3,x]
[Out] 1/(2*E^(2*x)) - (3*E^(2*x))/2 + E^(4*x)/4 + 3*x
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 272

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$
\begin{aligned}
\int e^x\left(-e^{-x}+e^x\right)^3\,dx &= \text{Subst}\left(\int \frac{\left(-1+x^2\right)^3}{x^3}\,dx,x,e^x\right)\\
&= \frac{1}{2}\text{Subst}\left(\int \frac{(-1+x)^3}{x^2}\,dx,x,e^{2x}\right)\\
&= \frac{1}{2}\text{Subst}\left(\int \left(-3-\frac{1}{x^2}+\frac{3}{x}+x\right)\,dx,x,e^{2x}\right)\\
&= \frac{e^{-2x}}{2}-\frac{3e^{2x}}{2}+\frac{e^{4x}}{4}+3x
\end{aligned}
$$

Mathematica [A]
time = 0.03, size = 30, normalized size = 0.97

$$\frac{1}{4}e^{-2x}\left(2-6e^{4x}+e^{6x}\right)+3\log\left(e^x\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*(-E^(-x) + E^x)^3,x]
[Out] (2 - 6*E^(4*x) + E^(6*x))/(4*E^(2*x)) + 3*Log[E^x]
```

Maple [A]
time = 0.02, size = 25, normalized size = 0.81

method	result	size
risch	$3x+\frac{e^{4x}}{4}-\frac{3\,e^{2x}}{2}+\frac{e^{-2x}}{2}$	23
derivativedivides	$\frac{e^{4x}}{4}-\frac{3\,e^{2x}}{2}+3\ln\left(e^x\right)+\frac{e^{-2x}}{2}$	25
default	$\frac{e^{4x}}{4}-\frac{3\,e^{2x}}{2}+3\ln\left(e^x\right)+\frac{e^{-2x}}{2}$	25
norman	$\left(-\frac{3\,e^{5x}}{2}+\frac{e^{7x}}{4}+3\,e^{3x}x+\frac{e^x}{2}\right)e^{-3x}$	30

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(-1/exp(x)+exp(x))^3,x,method=_RETURNVERBOSE)
[Out] 1/4*exp(x)^4-3/2*exp(x)^2+3*ln(exp(x))+1/2/exp(x)^2
```

Maxima [A]
time = 0.29, size = 24, normalized size = 0.77

$$-\frac{1}{4}\left(6\,e^{(-2\,x)}-1\right)e^{(4\,x)}+3\,x+\frac{1}{2}\,e^{(-2\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-1/exp(x)+exp(x))^3,x, algorithm="maxima")
```

```
[Out] -1/4*(6*e^(-2*x) - 1)*e^(4*x) + 3*x + 1/2*e^(-2*x)
```

Fricas [A]
time = 0.37, size = 25, normalized size = 0.81

$$\frac{1}{4}\left(12\,xe^{(2\,x)}+e^{(6\,x)}-6\,e^{(4\,x)}+2\right)e^{(-2\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-1/exp(x)+exp(x))^3,x, algorithm="fricas")
```

```
[Out] 1/4*(12*x*e^(2*x) + e^(6*x) - 6*e^(4*x) + 2)*e^(-2*x)
```

Sympy [A]
time = 0.05, size = 26, normalized size = 0.84

$$3x+\frac{e^{4x}}{4}-\frac{3e^{2x}}{2}+\frac{e^{-2x}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-1/exp(x)+exp(x))**3,x)
```

```
[Out] 3*x + exp(4*x)/4 - 3*exp(2*x)/2 + exp(-2*x)/2
```

Giac [A]
time = 5.22, size = 30, normalized size = 0.97

$$-\frac{1}{2}\left(3\,e^{(2\,x)}-1\right)e^{(-2\,x)}+3\,x+\frac{1}{4}\,e^{(4\,x)}-\frac{3}{2}\,e^{(2\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-1/exp(x)+exp(x))^3,x, algorithm="giac")
```

```
[Out] -1/2*(3*e^(2*x) - 1)*e^(-2*x) + 3*x + 1/4*e^(4*x) - 3/2*e^(2*x)
```

Mupad [B]
time = 3.59, size = 22, normalized size = 0.71

$$3\,x+\frac{\mathrm{e}^{-2\,x}}{2}-\frac{3\,\mathrm{e}^{2\,x}}{2}+\frac{\mathrm{e}^{4\,x}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-exp(x)*(exp(-x) - exp(x))^3,x)
```

```
[Out] 3*x + exp(-2*x)/2 - (3*exp(2*x))/2 + exp(4*x)/4
```

3.724 $\int \frac{1+4^x}{1+2^x} \, dx$

Optimal. Leaf size=22

$$x+\frac{2^x}{\log(2)}-\frac{2\log(1+2^x)}{\log(2)}$$

```
[Out] x+2^x/ln(2)-2*ln(1+2^x)/ln(2)
```

Rubi [A]
time = 0.02, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2320, 908}

$$x-\frac{2\log(2^x+1)}{\log(2)}+\frac{2^x}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[(1 + 4^x)/(1 + 2^x),x]
```

```
[Out] x + 2^x/Log[2] - (2*Log[1 + 2^x])/Log[2]
```

Rule 908

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_) + (c_.)*(x_)^
2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g*x)^n*(a + c*x
^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ[c
*d^2 + a*e^2, 0] && IntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ
[m, 0] && ILtQ[n, 0]))
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}
\int \frac{1+4^x}{1+2^x} \, dx &= \frac{\text{Subst}\left(\int \frac{1+x^2}{x(1+x)} \, dx, x, 2^x\right)}{\log(2)}\\
&= \frac{\text{Subst}\left(\int \left(1+\frac{1}{x}-\frac{2}{1+x}\right) \, dx, x, 2^x\right)}{\log(2)}\\
&= x+\frac{2^x}{\log(2)}-\frac{2\log(1+2^x)}{\log(2)}
\end{aligned}$$

Mathematica [A]
time = 0.07, size = 21, normalized size = 0.95

$$\frac{2^x+x\log(2)-2\log(1+2^x)}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 + 4^x)/(1 + 2^x),x]
[Out] (2^x + x*Log[2] - 2*Log[1 + 2^x])/Log[2]
```

Maple [A]
time = 0.02, size = 23, normalized size = 1.05

method	result	size
risch	$x+\frac{2^x}{\ln(2)}-\frac{2\ln(1+2^x)}{\ln(2)}$	23
norman	$x+\frac{e^{x\ln(2)}}{\ln(2)}-\frac{2\ln(1+e^{x\ln(2)})}{\ln(2)}$	27

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1+4^x)/(1+2^x),x,method=_RETURNVERBOSE)
[Out] x+2^x/ln(2)-2*ln(1+2^x)/ln(2)
```

Maxima [A]
time = 0.53, size = 22, normalized size = 1.00

$$x+\frac{2^x}{\log(2)}-\frac{2\log(2^x+1)}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+4^x)/(1+2^x),x, algorithm="maxima")
[Out] x + 2^x/log(2) - 2*log(2^x + 1)/log(2)
```

Fricas [A]
time = 0.42, size = 21, normalized size = 0.95

$$\frac{x\log(2)+2^x-2\log(2^x+1)}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+4^x)/(1+2^x),x, algorithm="fricas")
[Out] (x*log(2) + 2^x - 2*log(2^x + 1))/log(2)
```

Sympy [**A**]
time = 0.13, size = 29, normalized size = 1.32

$$x+\frac{e^{\frac{x\log(4)}{2}}}{\log(2)}-\frac{2\log\left(e^{\frac{x\log(4)}{2}}+1\right)}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+4**x)/(1+2**x),x)
[Out] x + exp(x*log(4)/2)/log(2) - 2*log(exp(x*log(4)/2) + 1)/log(2)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+4^x)/(1+2^x),x, algorithm="giac")
[Out] integrate((4^x + 1)/(2^x + 1), x)
```

Mupad [**B**]
time = 3.48, size = 21, normalized size = 0.95

$$\frac{x\ \ln(2)-2\ \ln(2^x+1)+2^x}{\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((4^x + 1)/(2^x + 1),x)
[Out] (x*log(2) - 2*log(2^x + 1) + 2^x)/log(2)
```

3.725 $\int \frac{1+4^x}{1+2^{-x}}\, dx$

Optimal. Leaf size=34

$$-\frac{2^x}{\log(2)}+\frac{2^{-1+2x}}{\log(2)}+\frac{2\log\left(1+2^x\right)}{\log(2)}$$

[Out] -2^x/ln(2)+2^(-1+2*x)/ln(2)+2*ln(1+2^x)/ln(2)

Rubi [A]
time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {2320, 711}

$$\frac{2\log\left(2^x+1\right)}{\log(2)}-\frac{2^x}{\log(2)}+\frac{2^{2x-1}}{\log(2)}$$

Antiderivative was successfully verified.

[In] Int[(1 + 4^x)/(1 + 2^(-x)),x]

[Out] -(2^x/Log[2]) + 2^(-1 + 2*x)/Log[2] + (2*Log[1 + 2^x])/Log[2]

Rule 711

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m},
 x] && NeQ[c*d^2 + a*e^2, 0] && IGtQ[p, 0]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] && !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] && !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{1+4^x}{1+2^{-x}}\, dx &= \frac{\operatorname{Subst}\left(\int \frac{1+x^2}{1+x}\, dx,x,2^x\right)}{\log(2)}\\ &= \frac{\operatorname{Subst}\left(\int \left(-1+x+\frac{2}{1+x}\right)\, dx,x,2^x\right)}{\log(2)}\\ &= -\frac{2^x}{\log(2)}+\frac{2^{-1+2x}}{\log(2)}+\frac{2\log\left(1+2^x\right)}{\log(2)}\end{aligned}$$

Mathematica [A]
time = 0.08, size = 23, normalized size = 0.68

$$\frac{2^x(-2+2^x)+4\log(1+2^x)}{\log(4)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 + 4^x)/(1 + 2^(-x)),x]
[Out] (2^x*(-2 + 2^x) + 4*Log[1 + 2^x])/Log[4]
```

Maple [A]
time = 0.02, size = 34, normalized size = 1.00

method	result	size
risch	$-\frac{2^{x}}{\ln(2)}+\frac{2^{2x}}{2\ln(2)}+\frac{2\ln(1+2^{x})}{\ln(2)}$	34
norman	$-\frac{e^{x\ln(2)}}{\ln(2)}+\frac{e^{2x\ln(2)}}{2\ln(2)}+\frac{2\ln(1+e^{x\ln(2)})}{\ln(2)}$	40

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1+4^x)/(1+1/(2^x)),x,method=_RETURNVERBOSE)
[Out] -2^x/ln(2)+1/2/ln(2)*(2^x)^2+2*ln(1+2^x)/ln(2)
```

Maxima [A]
time = 0.51, size = 40, normalized size = 1.18

$$2\,x-\frac{2^{2\,x-1}(2^{-x+1}-1)}{\log(2)}+\frac{2\,\log\left(\frac{1}{2^x}+1\right)}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+4^x)/(1+1/(2^x)),x, algorithm="maxima")
[Out] 2*x - 2^(2*x - 1)*(2^(-x + 1) - 1)/log(2) + 2*log(1/2^x + 1)/log(2)
```

Fricas [A]
time = 0.37, size = 25, normalized size = 0.74

$$\frac{2^{2\,x}-2\cdot 2^x+4\,\log(2^x+1)}{2\,\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+4^x)/(1+1/(2^x)),x, algorithm="fricas")
[Out] 1/2*(2^(2*x) - 2*2^x + 4*log(2^x + 1))/log(2)
```

Sympy [A]
time = 0.14, size = 39, normalized size = 1.15

$$2x + \frac{2^{2x}\log(2) - 2\cdot 2^{x}\log(2)}{2\log(2)^{2}} + \frac{2\log(1+2^{-x})}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+4**x)/(1+1/(2**x)),x)
```

```
[Out] 2*x + (2**(2*x)*log(2) - 2*2**x*log(2))/(2*log(2)**2) + 2*log(1 + 2**(-x))/
log(2)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+4^x)/(1+1/(2^x)),x, algorithm="giac")
```

```
[Out] integrate((4^x + 1)/(1/2^x + 1), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{4^x+1}{\frac{1}{2^x}+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((4^x + 1)/(1/2^x + 1),x)
```

```
[Out] int((4^x + 1)/(1/2^x + 1), x)
```

3.726 $\int \left(\frac{e^{(a+x)^2}}{x^2}-\frac{2ae^{(a+x)^2}}{x}\right)\,dx$

Optimal. Leaf size=23

$$-\frac{e^{(a+x)^2}}{x}+\sqrt{\pi}\,\text{erfi}(a+x)$$

```
[Out] -exp((a+x)^2)/x+erfi(a+x)*Pi^(1/2)
```

Rubi [A]

time = 0.03, antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}=0.080$, Rules used = {2252, 2235}

$$\sqrt{\pi}\,\text{Erfi}(a+x)-\frac{e^{(a+x)^2}}{x}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + x)^2/x^2 - (2*a*E^(a + x)^2)/x,x]
```

```
[Out] -(E^(a + x)^2/x) + Sqrt[Pi]*Erfi[a + x]
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2252

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2)*((e_.) + (f_.)*(x_))^(m_),
x_Symbol] :> Simp[f*(e + f*x)^(m + 1)*(F^(a + b*(c + d*x)^2)/((m + 1)*f^2))
, x] + (-Dist[2*b*d^2*(Log[F]/(f^2*(m + 1))), Int[(e + f*x)^(m + 2)*F^(a +
b*(c + d*x)^2), x], x] + Dist[2*b*d*(d*e - c*f)*(Log[F]/(f^2*(m + 1))), Int
[(e + f*x)^(m + 1)*F^(a + b*(c + d*x)^2), x], x]) /; FreeQ[{F, a, b, c, d,
e, f}, x] && NeQ[d*e - c*f, 0] && LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \left(\frac{e^{(a+x)^2}}{x^2}-\frac{2ae^{(a+x)^2}}{x}\right)\,dx &= -\left((2a)\int \frac{e^{(a+x)^2}}{x}\,dx\right)+\int \frac{e^{(a+x)^2}}{x^2}\,dx\\ &= -\frac{e^{(a+x)^2}}{x}+2\int e^{(a+x)^2}\,dx\\ &= -\frac{e^{(a+x)^2}}{x}+\sqrt{\pi}\,\text{erfi}(a+x)\end{aligned}$$

Mathematica [A]
time = 0.17, size = 23, normalized size = 1.00

$$-\frac{e^{(a+x)^2}}{x}+\sqrt{\pi}\,\mathrm{erfi}(a+x)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + x)^2/x^2 - (2*a*E^(a + x)^2)/x,x]
```

```
[Out] -(E^(a + x)^2/x) + Sqrt[Pi]*Erfi[a + x]
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{e}^{(a+x)^2}}{x^2}-\frac{2a\,\mathrm{e}^{(a+x)^2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((a+x)^2)/x^2-2*a*exp((a+x)^2)/x,x)
```

```
[Out] int(exp((a+x)^2)/x^2-2*a*exp((a+x)^2)/x,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((a+x)^2)/x^2-2*a*exp((a+x)^2)/x,x, algorithm="maxima")
```

```
[Out] integrate(-2*a*e^((a + x)^2)/x + e^((a + x)^2)/x^2, x)
```

Fricas [A]
time = 0.37, size = 28, normalized size = 1.22

$$\frac{\sqrt{\pi}\,x\,\mathrm{erfi}\left(a+x\right)-e^{\left(a^2+2\,ax+x^2\right)}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((a+x)^2)/x^2-2*a*exp((a+x)^2)/x,x, algorithm="fricas")
```

```
[Out] (sqrt(pi)*x*erfi(a + x) - e^(a^2 + 2*a*x + x^2))/x
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\left(\int\left(-\frac{e^{x^2}e^{2ax}}{x^2}\right)dx+\int\frac{2ae^{x^2}e^{2ax}}{x}\,dx\right)e^{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(exp((a+x)**2)/x**2-2*a*exp((a+x)**2)/x,x)

[Out] -(Integral(-exp(x**2)*exp(2*a*x)/x**2, x) + Integral(2*a*exp(x**2)*exp(2*a*x)/x, x))*exp(a**2)

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(exp((a+x)^2)/x^2-2*a*exp((a+x)^2)/x,x, algorithm="giac")

[Out] integrate(-2*a*e^((a + x)^2)/x + e^((a + x)^2)/x^2, x)

Mupad [B]
time = 3.41, size = 27, normalized size = 1.17

$$\sqrt{\pi}\,\operatorname{erfi}(a+x)-\frac{e^{a^2}\,e^{x^2}\,e^{2\,a\,x}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(exp((a + x)^2)/x^2 - (2*a*exp((a + x)^2))/x,x)

[Out] pi^(1/2)*erfi(a + x) - (exp(a^2)*exp(x^2)*exp(2*a*x))/x

3.727 $\int e^{-x^2}(x^4+x^6+x^8)\,dx$

Optimal. Leaf size=66

$$-\frac{147}{16}e^{-x^2}x-\frac{49}{8}e^{-x^2}x^3-\frac{9}{4}e^{-x^2}x^5-\frac{1}{2}e^{-x^2}x^7+\frac{147}{32}\sqrt{\pi}\,\mathrm{erf}(x)$$

```
[Out] -147/16*x/exp(x^2)-49/8*x^3/exp(x^2)-9/4*x^5/exp(x^2)-1/2*x^7/exp(x^2)+147/
32*erf(x)*Pi^(1/2)
```

Rubi [A]
time = 0.12, antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {1608, 2258, 2243, 2236}

$$\frac{147}{32}\sqrt{\pi}\,\mathrm{Erf}(x)-\frac{147}{16}e^{-x^2}x-\frac{1}{2}e^{-x^2}x^7-\frac{9}{4}e^{-x^2}x^5-\frac{49}{8}e^{-x^2}x^3$$

Antiderivative was successfully verified.

```
[In] Int[(x^4 + x^6 + x^8)/E^x^2,x]
```

```
[Out] (-147*x)/(16*E^x^2) - (49*x^3)/(8*E^x^2) - (9*x^5)/(4*E^x^2) - x^7/(2*E^x^2
) + (147*Sqrt[Pi]*Erf[x])/32
```

Rule 1608

```
Int[(u_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.) + (c_.)*(x_)^(r_.))^(n_.), x
_Symbol] :> Int[u*x^(n*p)*(a + b*x^(q - p) + c*x^(r - p))^n, x] /; FreeQ[{a
, b, c, p, q, r}, x] && IntegerQ[n] && PosQ[q - p] && PosQ[r - p]
```

Rule 2236

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erf[(c + d*x)*Rt[(-b)*Log[F], 2]]/(2*d*Rt[(-b)*Log[F], 2])), x] /; Fr
eeQ[{F, a, b, c, d}, x] && NegQ[b]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\begin{aligned}
\int e^{-x^2}\left(x^4+x^6+x^8\right)\,dx &= \int e^{-x^2}x^4\left(1+x^2+x^4\right)\,dx\\
&= \int \left(e^{-x^2}x^4+e^{-x^2}x^6+e^{-x^2}x^8\right)dx\\
&= \int e^{-x^2}x^4\,dx+\int e^{-x^2}x^6\,dx+\int e^{-x^2}x^8\,dx\\
&= -\frac{1}{2}e^{-x^2}x^3-\frac{1}{2}e^{-x^2}x^5-\frac{1}{2}e^{-x^2}x^7+\frac{3}{2}\int e^{-x^2}x^2\,dx+\frac{5}{2}\int e^{-x^2}x^4\,dx+\frac{7}{2}\int e^{-x^2}\\
&= -\frac{3}{4}e^{-x^2}x-\frac{7}{4}e^{-x^2}x^3-\frac{9}{4}e^{-x^2}x^5-\frac{1}{2}e^{-x^2}x^7+\frac{3}{4}\int e^{-x^2}\,dx+\frac{15}{4}\int e^{-x^2}x^2\,dx+\\
&= -\frac{21}{8}e^{-x^2}x-\frac{49}{8}e^{-x^2}x^3-\frac{9}{4}e^{-x^2}x^5-\frac{1}{2}e^{-x^2}x^7+\frac{3}{8}\sqrt{\pi}\,\mathrm{erf}(x)+\frac{15}{8}\int e^{-x^2}\,dx+\\
&= -\frac{147}{16}e^{-x^2}x-\frac{49}{8}e^{-x^2}x^3-\frac{9}{4}e^{-x^2}x^5-\frac{1}{2}e^{-x^2}x^7+\frac{21}{16}\sqrt{\pi}\,\mathrm{erf}(x)+\frac{105}{16}\int e^{-x^2}\,d\\
&= -\frac{147}{16}e^{-x^2}x-\frac{49}{8}e^{-x^2}x^3-\frac{9}{4}e^{-x^2}x^5-\frac{1}{2}e^{-x^2}x^7+\frac{147}{32}\sqrt{\pi}\,\mathrm{erf}(x)
\end{aligned}$$

Mathematica [A]
time = 0.20, size = 41, normalized size = 0.62

$$\frac{1}{32}\left(-2e^{-x^2}x\left(147+98x^2+36x^4+8x^6\right)+147\sqrt{\pi}\,\mathrm{erf}(x)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4 + x^6 + x^8)/E^x^2,x]
[Out] ((-2*x*(147 + 98*x^2 + 36*x^4 + 8*x^6))/E^x^2 + 147*Sqrt[Pi]*Erf[x])/32
```

Maple [A]
time = 0.03, size = 51, normalized size = 0.77

method	result	size
default	$-\frac{147x\,e^{-x^2}}{16}-\frac{49x^3e^{-x^2}}{8}-\frac{9x^5e^{-x^2}}{4}-\frac{x^7e^{-x^2}}{2}+\frac{147\,\mathrm{erf}(x)\sqrt{\pi}}{32}$	51
risch	$-\frac{147x\,e^{-x^2}}{16}-\frac{49x^3e^{-x^2}}{8}-\frac{9x^5e^{-x^2}}{4}-\frac{x^7e^{-x^2}}{2}+\frac{147\,\mathrm{erf}(x)\sqrt{\pi}}{32}$	51

meijerg	$-\frac{x(72x^6+252x^4+630x^2+945)\,\mathrm{e}^{-x^2}}{144}+\frac{147\,\mathrm{erf}(x)\sqrt{\pi}}{32}-\frac{x(28x^4+70x^2+105)\,\mathrm{e}^{-x^2}}{56}-\frac{x(10x^2+15)\,\mathrm{e}^{-x^2}}{20}$	72

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^8+x^6+x^4)/exp(x^2),x,method=_RETURNVERBOSE)
```

```
[Out] -147/16*x/exp(x^2)-49/8*x^3/exp(x^2)-9/4*x^5/exp(x^2)-1/2*x^7/exp(x^2)+147/
32*erf(x)*Pi^(1/2)
```

Maxima [A]
time = 0.29, size = 74, normalized size = 1.12

$$-\frac{1}{16}\left(8\,x^{7}+28\,x^{5}+70\,x^{3}+105\,x\right)e^{\left(-x^{2}\right)}-\frac{1}{8}\left(4\,x^{5}+10\,x^{3}+15\,x\right)e^{\left(-x^{2}\right)}-\frac{1}{4}\left(2\,x^{3}+3\,x\right)e^{\left(-x^{2}\right)}+\frac{147}{32}\,\sqrt{\pi}\,\operatorname{erf}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((x^8+x^6+x^4)/exp(x^2),x, algorithm="maxima")
```

```
[Out] -1/16*(8*x^7 + 28*x^5 + 70*x^3 + 105*x)*e^(-x^2) - 1/8*(4*x^5 + 10*x^3 + 15
*x)*e^(-x^2) - 1/4*(2*x^3 + 3*x)*e^(-x^2) + 147/32*sqrt(pi)*erf(x)
```

Fricas [A]
time = 0.36, size = 35, normalized size = 0.53

$$-\frac{1}{16}\left(8\,x^{7}+36\,x^{5}+98\,x^{3}+147\,x\right)e^{\left(-x^{2}\right)}+\frac{147}{32}\,\sqrt{\pi}\,\operatorname{erf}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((x^8+x^6+x^4)/exp(x^2),x, algorithm="fricas")
```

```
[Out] -1/16*(8*x^7 + 36*x^5 + 98*x^3 + 147*x)*e^(-x^2) + 147/32*sqrt(pi)*erf(x)
```

Sympy [A]
time = 6.50, size = 54, normalized size = 0.82

$$-\frac{x^{7}e^{-x^{2}}}{2}-\frac{9x^{5}e^{-x^{2}}}{4}-\frac{49x^{3}e^{-x^{2}}}{8}-\frac{147xe^{-x^{2}}}{16}+\frac{147\sqrt{\pi}\,\operatorname{erf}\left(x\right)}{32}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((x**8+x**6+x**4)/exp(x**2),x)
```

```
[Out] -x**7*exp(-x**2)/2 - 9*x**5*exp(-x**2)/4 - 49*x**3*exp(-x**2)/8 - 147*x*exp
(-x**2)/16 + 147*sqrt(pi)*erf(x)/32
```

Giac [A]
time = 3.35, size = 35, normalized size = 0.53

$$-\frac{1}{16}\left(8\,x^{7}+36\,x^{5}+98\,x^{3}+147\,x\right)e^{\left(-x^{2}\right)}+\frac{147}{32}\,\sqrt{\pi}\,\operatorname{erf}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((x^8+x^6+x^4)/exp(x^2),x, algorithm="giac")
```

```
[Out] -1/16*(8*x^7 + 36*x^5 + 98*x^3 + 147*x)*e^(-x^2) + 147/32*sqrt(pi)*erf(x)
```

Mupad [B]
time = 3.62, size = 50, normalized size = 0.76

$$\frac{147\,\sqrt{\pi}\,\operatorname{erf}(x)}{32}-\frac{49\,x^3\,\mathrm{e}^{-x^2}}{8}-\frac{9\,x^5\,\mathrm{e}^{-x^2}}{4}-\frac{x^7\,\mathrm{e}^{-x^2}}{2}-\frac{147\,x\,\mathrm{e}^{-x^2}}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-x^2)*(x^4 + x^6 + x^8),x)
```

```
[Out] (147*pi^(1/2)*erf(x))/32 - (49*x^3*exp(-x^2))/8 - (9*x^5*exp(-x^2))/4 - (x^
7*exp(-x^2))/2 - (147*x*exp(-x^2))/16
```

3.728 $\int \frac{1}{-e^x+e^{3x}}\,dx$

Optimal. Leaf size=12

$$e^{-x} - \tanh^{-1}(e^x)$$

```
[Out] exp(-x)-arctanh(exp(x))
```

Rubi [A]

time = 0.01, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$, Rules used = {2320, 331, 213}

$$e^{-x} - \tanh^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Int[(-E^x + E^(3*x))^(-1),x]
```

```
[Out] E^(-x) - ArcTanh[E^x]
```

Rule 213

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[b, 2])^(-
1))*ArcTanh[Rt[b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] &&
 (LtQ[a, 0] || GtQ[b, 0])
```

Rule 331

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*x
)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] - Dist[b*((m + n*(p + 1)
+ 1)/(a*c^n*(m + 1))), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{1}{-e^x+e^{3x}}\,dx = \text{Subst}\left(\int \frac{1}{x^2\,(-1+x^2)}\,dx, x, e^x\right)$$
$$= e^{-x} + \text{Subst}\left(\int \frac{1}{-1+x^2}\,dx, x, e^x\right)$$
$$= e^{-x} - \tanh^{-1}(e^x)$$

Mathematica [A]
time = 0.03, size = 12, normalized size = 1.00

$$e^{-x} - \tanh^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[(-E^x + E^(3*x))^(-1),x]
```

```
[Out] E^(-x) - ArcTanh[E^x]
```

Maple [A]
time = 0.02, size = 20, normalized size = 1.67

method	result	size
default	$-\frac{\ln(1+e^x)}{2}+\frac{\ln(-1+e^x)}{2}+e^{-x}$	20
norman	$-\frac{\ln(1+e^x)}{2}+\frac{\ln(-1+e^x)}{2}+e^{-x}$	20
risch	$-\frac{\ln(1+e^x)}{2}+\frac{\ln(-1+e^x)}{2}+e^{-x}$	20

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-exp(x)+exp(3*x)),x,method=_RETURNVERBOSE)
```

```
[Out] -1/2*ln(1+exp(x))+1/2*ln(-1+exp(x))+1/exp(x)
```

Maxima [A]
time = 0.30, size = 19, normalized size = 1.58

$$e^{(-x)} - \frac{1}{2}\log\left(e^x+1\right) + \frac{1}{2}\log\left(e^x-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-exp(x)+exp(3*x)),x, algorithm="maxima")
```

```
[Out] e^(-x) - 1/2*log(e^x + 1) + 1/2*log(e^x - 1)
```

Fricas [B] Leaf count of result is larger than twice the leaf count of optimal. 25 vs. $2(10) = 20$.
time = 0.39, size = 25, normalized size = 2.08

$$-\frac{1}{2}\left(e^{x}\log\left(e^{x}+1\right)-e^{x}\log\left(e^{x}-1\right)-2\right)e^{(-x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-exp(x)+exp(3*x)),x, algorithm="fricas")
```

```
[Out] -1/2*(e^x*log(e^x + 1) - e^x*log(e^x - 1) - 2)*e^(-x)
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 20 vs. $2(8) = 16$.
time = 0.04, size = 20, normalized size = 1.67

$$\frac{\log\left(e^{x}-1\right)}{2}-\frac{\log\left(e^{x}+1\right)}{2}+e^{-x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-exp(x)+exp(3*x)),x)
```

```
[Out] log(exp(x) - 1)/2 - log(exp(x) + 1)/2 + exp(-x)
```

Giac [A]
time = 6.28, size = 20, normalized size = 1.67

$$e^{(-x)}-\frac{1}{2}\log\left(e^{x}+1\right)+\frac{1}{2}\log\left(|e^{x}-1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-exp(x)+exp(3*x)),x, algorithm="giac")
```

```
[Out] e^(-x) - 1/2*log(e^x + 1) + 1/2*log(abs(e^x - 1))
```

Mupad [B]
time = 0.06, size = 19, normalized size = 1.58

$$\mathrm{e}^{-x}+\frac{\ln\left(\mathrm{e}^{x}-1\right)}{2}-\frac{\ln\left(\mathrm{e}^{x}+1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(exp(3*x) - exp(x)),x)
```

```
[Out] exp(-x) + log(exp(x) - 1)/2 - log(exp(x) + 1)/2
```

3.729 $\int \frac{e^x(-5+x+x^2)}{(-1+x)^2} dx$

Optimal. Leaf size=16

$$e^x - \frac{3e^x}{1-x}$$

[Out] exp(x)-3*exp(x)/(1-x)

Rubi [A]
time = 0.05, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$, Rules used = {2230, 2225, 2208, 2209}

$$e^x - \frac{3e^x}{1-x}$$

Antiderivative was successfully verified.

[In] Int[(E^x*(-5 + x + x^2))/(-1 + x)^2,x]

[Out] E^x - (3*E^x)/(1 - x)

Rule 2208

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_), x_Symbol] :> Simp[(c + d*x)^(m + 1)*((b*F^(g*(e + f*x)))^n/(d*(m + 1)))
, x] - Dist[f*g*n*(Log[F]/(d*(m + 1))), Int[(c + d*x)^(m + 1)*(b*F^(g*(e +
f*x)))^n, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && LtQ[m, -1] && Int
egerQ[2*m] &&  !TrueQ[$UseGamma]
```

Rule 2209

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - c*(f/d)))/d)*ExpIntegralEi[f*g*(c + d*x)*(Log[F]/d)], x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !TrueQ[$UseGamma]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2230

```
Int[(F_)^((c_.)*(v_))*(u_)^(m_.)*(w_), x_Symbol] :> Int[ExpandIntegrand[F^(
c*ExpandToSum[v, x]), w*NormalizePowerOfLinear[u, x]^m, x], x] /; FreeQ[{F,
 c}, x] && PolynomialQ[w, x] && LinearQ[v, x] && PowerOfLinearQ[u, x] && In
tegerQ[m] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\begin{aligned}\int \frac{e^x(-5+x+x^2)}{(-1+x)^2}\,dx &= \int \left(e^x-\frac{3e^x}{(-1+x)^2}+\frac{3e^x}{-1+x}\right)dx\\ &= -\left(3\int \frac{e^x}{(-1+x)^2}\,dx\right)+3\int \frac{e^x}{-1+x}\,dx+\int e^x\,dx\\ &= e^x-\frac{3e^x}{1-x}+3e\text{Ei}(-1+x)-3\int \frac{e^x}{-1+x}\,dx\\ &= e^x-\frac{3e^x}{1-x}\end{aligned}$$

Mathematica [A]
time = 0.04, size = 13, normalized size = 0.81

$$e^x\left(1+\frac{3}{-1+x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^x*(-5 + x + x^2))/(-1 + x)^2,x]
[Out] E^x*(1 + 3/(-1 + x))
```

Maple [A]
time = 0.08, size = 13, normalized size = 0.81

method	result	size
gosper	$\frac{(x+2)e^x}{-1+x}$	12
risch	$\frac{(x+2)e^x}{-1+x}$	12
default	$\frac{3\,e^x}{-1+x}+e^x$	13
norman	$\frac{e^x x+2\,e^x}{-1+x}$	16

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(x^2+x-5)/(-1+x)^2,x,method=_RETURNVERBOSE)
[Out] 3*exp(x)/(-1+x)+exp(x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(x^2+x-5)/(-1+x)^2,x, algorithm="maxima")
```

```
[Out] (x^2 + x)*e^x/(x^2 - 2*x + 1) + 5*e*exp_integral_e(2, -x + 1)/(x - 1) + int
egrate((3*x + 1)*e^x/(x^3 - 3*x^2 + 3*x - 1), x)
```

Fricas [A]
time = 0.40, size = 11, normalized size = 0.69

$$\frac{(x+2)e^x}{x-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(x^2+x-5)/(-1+x)^2,x, algorithm="fricas")
```

```
[Out] (x + 2)*e^x/(x - 1)
```

Sympy [A]
time = 0.03, size = 8, normalized size = 0.50

$$\frac{(x+2)\,e^x}{x-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(x**2+x-5)/(-1+x)**2,x)
```

```
[Out] (x + 2)*exp(x)/(x - 1)
```

Giac [B] Leaf count of result is larger than twice the leaf count of optimal. 54 vs. 2(12) = 24.
time = 5.56, size = 54, normalized size = 3.38

$$\frac{(x-1)\left(\frac{1}{x-1}+1\right)e^{\left((x-1)\left(\frac{1}{x-1}+1\right)\right)}+2\,e^{\left((x-1)\left(\frac{1}{x-1}+1\right)\right)}}{(x-1)\left(\frac{1}{x-1}+1\right)-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(x^2+x-5)/(-1+x)^2,x, algorithm="giac")
```

```
[Out] ((x - 1)*(1/(x - 1) + 1)*e^((x - 1)*(1/(x - 1) + 1)) + 2*e^((x - 1)*(1/(x -
 1) + 1)))/((x - 1)*(1/(x - 1) + 1) - 1)
```

Mupad [B]
time = 0.08, size = 11, normalized size = 0.69

$$\frac{\mathrm{e}^x\,(x+2)}{x-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(x)*(x + x^2 - 5))/(x - 1)^2,x)
```

```
[Out] (exp(x)*(x + 2))/(x - 1)
```

3.730 $\int \frac{e^{x^2}x^3}{(1+x^2)^2}\,dx$

Optimal. Leaf size=16

$$\frac{e^{x^2}}{2(1+x^2)}$$

```
[Out] 1/2*exp(x^2)/(x^2+1)
```

Rubi [A]
time = 0.04, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.062$, Rules used = {2327}

$$\frac{e^{x^2}}{2(x^2+1)}$$

Antiderivative was successfully verified.

```
[In] Int[(E^x^2*x^3)/(1 + x^2)^2,x]
```

```
[Out] E^x^2/(2*(1 + x^2))
```

Rule 2327

```
Int[(F_)^(u_)*(v_)^(n_.)*(w_), x_Symbol] :> With[{z = Log[F]*v*D[u, x] + (n
 + 1)*D[v, x]}, Simp[(Coefficient[w, x, Exponent[w, x]]/Coefficient[z, x, E
xponent[z, x]])*F^u*v^(n + 1), x] /; EqQ[Exponent[w, x], Exponent[z, x]] &&
 EqQ[w*Coefficient[z, x, Exponent[z, x]], z*Coefficient[w, x, Exponent[w, x
]]]] /; FreeQ[{F, n}, x] && PolynomialQ[u, x] && PolynomialQ[v, x] && Polyn
omialQ[w, x]
```

Rubi steps

$$\int \frac{e^{x^2}x^3}{(1+x^2)^2}\,dx = \frac{e^{x^2}}{2(1+x^2)}$$

Mathematica [A]
time = 0.08, size = 16, normalized size = 1.00

$$\frac{e^{x^2}}{2(1+x^2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^x^2*x^3)/(1 + x^2)^2,x]
[Out] E^x^2/(2*(1 + x^2))
```

Maple [A]
time = 0.07, size = 14, normalized size = 0.88

method	result	size
gosper	$\frac{e^{x^2}}{2x^2+2}$	14
derivativedivides	$\frac{e^{x^2}}{2x^2+2}$	14
default	$\frac{e^{x^2}}{2x^2+2}$	14
norman	$\frac{e^{x^2}}{2x^2+2}$	14
risch	$\frac{e^{x^2}}{2x^2+2}$	14

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^2)*x^3/(x^2+1)^2,x,method=_RETURNVERBOSE)
[Out] 1/2*exp(x^2)/(x^2+1)
```

Maxima [A]
time = 0.29, size = 13, normalized size = 0.81

$$\frac{e^{(x^2)}}{2\,(x^2+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*x^3/(x^2+1)^2,x, algorithm="maxima")
[Out] 1/2*e^(x^2)/(x^2 + 1)
```

Fricas [A]
time = 0.35, size = 13, normalized size = 0.81

$$\frac{e^{(x^2)}}{2\,(x^2+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*x^3/(x^2+1)^2,x, algorithm="fricas")
[Out] 1/2*e^(x^2)/(x^2 + 1)
```

Sympy [A]
time = 0.03, size = 10, normalized size = 0.62

$$\frac{e^{x^2}}{2x^2+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**2)*x**3/(x**2+1)**2,x)
```

```
[Out] exp(x**2)/(2*x**2 + 2)
```

Giac [A]
time = 6.02, size = 13, normalized size = 0.81

$$\frac{e^{\left(x^2\right)}}{2\left(x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*x^3/(x^2+1)^2,x, algorithm="giac")
```

```
[Out] 1/2*e^(x^2)/(x^2 + 1)
```

Mupad [B]
time = 3.48, size = 14, normalized size = 0.88

$$\frac{\mathrm{e}^{x^2}}{2\ \left(x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*exp(x^2))/(x^2 + 1)^2,x)
```

```
[Out] exp(x^2)/(2*(x^2 + 1))
```

3.731 $\int \frac{e^{3x}}{\sqrt{25+16e^{2x}}}\,dx$

Optimal. Leaf size=33

$$\frac{1}{32}e^{x}\sqrt{25+16e^{2x}}-\frac{25}{128}\sinh^{-1}\left(\frac{4e^{x}}{5}\right)$$

```
[Out] -25/128*arcsinh(4/5*exp(x))+1/32*exp(x)*(25+16*exp(2*x))^(1/2)
```

Rubi [A]
time = 0.02, antiderivative size = 33, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.158$, Rules used = {2280, 327, 221}

$$\frac{1}{32}e^{x}\sqrt{16e^{2x}+25}-\frac{25}{128}\sinh^{-1}\left(\frac{4e^{x}}{5}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^(3*x)/Sqrt[25 + 16*E^(2*x)],x]
[Out] (E^x*Sqrt[25 + 16*E^(2*x)])/32 - (25*ArcSinh[(4*E^x)/5])/128
```

Rule 221

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[Rt[b, 2]*(x/Sqrt
[a])]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 327

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Dist[
a*c^n*((m - n + 1)/(b*(m + n*p + 1))), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2280

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[g*h*(Log[G]/(d*e*Log
[F]))]}, Dist[Denominator[m]*(G^(f*h - c*g*(h/d))/(d*e*Log[F])), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^(e*((c + d*x)/Den
ominator[m]))], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^{3x}}{\sqrt{25+16e^{2x}}}\,dx = \text{Subst}\left(\int \frac{x^2}{\sqrt{25+16x^2}}\,dx, x, e^x\right)$$
$$= \frac{1}{32}e^x\sqrt{25+16e^{2x}} - \frac{25}{32}\text{Subst}\left(\int \frac{1}{\sqrt{25+16x^2}}\,dx, x, e^x\right)$$
$$= \frac{1}{32}e^x\sqrt{25+16e^{2x}} - \frac{25}{128}\sinh^{-1}\left(\frac{4e^x}{5}\right)$$

Mathematica [**A**]
time = 0.03, size = 33, normalized size = 1.00

$$\frac{1}{32}e^x\sqrt{25+16e^{2x}} - \frac{25}{128}\sinh^{-1}\left(\frac{4e^x}{5}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(3*x)/Sqrt[25 + 16*E^(2*x)],x]
[Out] (E^x*Sqrt[25 + 16*E^(2*x)])/32 - (25*ArcSinh[(4*E^x)/5])/128
```

Maple [**A**]
time = 0.03, size = 23, normalized size = 0.70

method	result	size
default	$-\frac{25\,\mathrm{arcsinh}\left(\frac{4\,e^{x}}{5}\right)}{128}+\frac{e^{x}\sqrt{25+16\,e^{2x}}}{32}$	23
risch	$-\frac{25\,\mathrm{arcsinh}\left(\frac{4\,e^{x}}{5}\right)}{128}+\frac{e^{x}\sqrt{25+16\,e^{2x}}}{32}$	23
meijerg	`error in int/gbinthm/express: unable to compute coeff\`	N/A

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(3*x)/(25+16*exp(2*x))^(1/2),x,method=_RETURNVERBOSE)
[Out] 1/32*exp(x)*(25+16*exp(x)^2)^(1/2)-25/128*arcsinh(4/5*exp(x))
```

Maxima [**B**] Leaf count of result is larger than twice the leaf count of optimal. 74 vs. 2(22) = 44.
time = 0.29, size = 74, normalized size = 2.24

$$\frac{25\sqrt{16\,e^{(2\,x)}+25}\,e^{(-x)}}{32\left((16\,e^{(2\,x)}+25)e^{(-2\,x)}-16\right)} - \frac{25}{256}\log\left(\sqrt{16\,e^{(2\,x)}+25}\,e^{(-x)}+4\right) + \frac{25}{256}\log\left(\sqrt{16\,e^{(2\,x)}+25}\,e^{(-x)}-4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)/(25+16*exp(2*x))^(1/2),x, algorithm="maxima")
```

```
[Out] 25/32*sqrt(16*e^(2*x) + 25)*e^(-x)/((16*e^(2*x) + 25)*e^(-2*x) - 16) - 25/2
56*log(sqrt(16*e^(2*x) + 25)*e^(-x) + 4) + 25/256*log(sqrt(16*e^(2*x) + 25)
*e^(-x) - 4)
```

Fricas [A]
time = 0.38, size = 33, normalized size = 1.00

$$\frac{1}{32}\sqrt{16\,e^{(2\,x)}+25}\,e^{x}+\frac{25}{128}\,\log\left(\sqrt{16\,e^{(2\,x)}+25}-4\,e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)/(25+16*exp(2*x))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/32*sqrt(16*e^(2*x) + 25)*e^x + 25/128*log(sqrt(16*e^(2*x) + 25) - 4*e^x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{e^{3x}}{\sqrt{16e^{2x}+25}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)/(25+16*exp(2*x))**(1/2),x)
```

```
[Out] Integral(exp(3*x)/sqrt(16*exp(2*x) + 25), x)
```

Giac [A]
time = 3.54, size = 33, normalized size = 1.00

$$\frac{1}{32}\sqrt{16\,e^{(2\,x)}+25}\,e^{x}+\frac{25}{128}\,\log\left(\sqrt{16\,e^{(2\,x)}+25}-4\,e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)/(25+16*exp(2*x))^(1/2),x, algorithm="giac")
```

```
[Out] 1/32*sqrt(16*e^(2*x) + 25)*e^x + 25/128*log(sqrt(16*e^(2*x) + 25) - 4*e^x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.03

$$\int\frac{\mathrm{e}^{3\,x}}{\sqrt{16\,\mathrm{e}^{2\,x}+25}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(3*x)/(16*exp(2*x) + 25)^(1/2),x)
```

```
[Out] int(exp(3*x)/(16*exp(2*x) + 25)^(1/2), x)
```

3.732 $\int \frac{1+e^x}{\sqrt{e^x+x}}\,dx$

Optimal. Leaf size=11

$$2\sqrt{e^x+x}$$

[Out] 2*(x+exp(x))^(1/2)

Rubi [A]
time = 0.02, antiderivative size = 11, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$, Rules used = $\{6818\}$

$$2\sqrt{x+e^x}$$

Antiderivative was successfully verified.

[In] Int[(1 + E^x)/Sqrt[E^x + x],x]

[Out] 2*Sqrt[E^x + x]

Rule 6818

```
Int[(u_)*(y_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Si
mp[q*(y^(m + 1)/(m + 1)), x] /;  !FalseQ[q]] /; FreeQ[m, x] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{1+e^x}{\sqrt{e^x+x}}\,dx = 2\sqrt{e^x+x}$$

Mathematica [A]
time = 0.01, size = 11, normalized size = 1.00

$$2\sqrt{e^x+x}$$

Antiderivative was successfully verified.

[In] Integrate[(1 + E^x)/Sqrt[E^x + x],x]

[Out] 2*Sqrt[E^x + x]

Maple [A]
time = 0.02, size = 9, normalized size = 0.82

method	result	size
derivativedivides	$2\sqrt{e^x + x}$	9
default	$2\sqrt{e^x + x}$	9
risch	$2\sqrt{e^x + x}$	9

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1+exp(x))/(exp(x)+x)^(1/2),x,method=_RETURNVERBOSE)
```

```
[Out] 2*(exp(x)+x)^(1/2)
```

Maxima [A]
time = 0.29, size = 8, normalized size = 0.73

$$2\sqrt{x + e^x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))/(exp(x)+x)^(1/2),x, algorithm="maxima")
```

```
[Out] 2*sqrt(x + e^x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))/(exp(x)+x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

Sympy [A]
time = 0.06, size = 8, normalized size = 0.73

$$2\sqrt{x + e^x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))/(exp(x)+x)**(1/2),x)
```

```
[Out] 2*sqrt(x + exp(x))
```

Giac [A]
time = 6.13, size = 8, normalized size = 0.73

$$2\sqrt{x + e^x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))/(exp(x)+x)^(1/2),x, algorithm="giac")
```

```
[Out] 2*sqrt(x + e^x)
```

Mupad [B]
time = 3.50, size = 8, normalized size = 0.73

$$2\sqrt{x+\mathrm{e}^x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(x) + 1)/(x + exp(x))^(1/2),x)
```

```
[Out] 2*(x + exp(x))^(1/2)
```

3.733 $\int \frac{1+e^x}{e^x+x} \, dx$

Optimal. Leaf size=6

$$\log(e^x+x)$$

[Out] ln(x+exp(x))

Rubi [A]
time = 0.01, antiderivative size = 6, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {6816}

$$\log(x+e^x)$$

Antiderivative was successfully verified.

[In] Int[(1 + E^x)/(E^x + x),x]

[Out] Log[E^x + x]

Rule 6816

```
Int[(u_)/(y_), x_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Simp[q*L
og[RemoveContent[y, x]], x] /;  !FalseQ[q]]
```

Rubi steps

$$\int \frac{1+e^x}{e^x+x} \, dx = \log(e^x+x)$$

Mathematica [A]
time = 0.01, size = 6, normalized size = 1.00

$$\log(e^x+x)$$

Antiderivative was successfully verified.

[In] Integrate[(1 + E^x)/(E^x + x),x]

[Out] Log[E^x + x]

Maple [A]
time = 0.01, size = 6, normalized size = 1.00

method	result	size

derivativedivides	$\ln(e^x + x)$	6
default	$\ln(e^x + x)$	6
norman	$\ln(e^x + x)$	6
risch	$\ln(e^x + x)$	6

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1+exp(x))/(exp(x)+x),x,method=_RETURNVERBOSE)
```

```
[Out] ln(exp(x)+x)
```

Maxima [A]
time = 0.30, size = 5, normalized size = 0.83

$$\log(x + e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))/(exp(x)+x),x, algorithm="maxima")
```

```
[Out] log(x + e^x)
```

Fricas [A]
time = 0.35, size = 5, normalized size = 0.83

$$\log(x + e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))/(exp(x)+x),x, algorithm="fricas")
```

```
[Out] log(x + e^x)
```

Sympy [A]
time = 0.03, size = 5, normalized size = 0.83

$$\log(x + e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))/(exp(x)+x),x)
```

```
[Out] log(x + exp(x))
```

Giac [A]
time = 3.48, size = 5, normalized size = 0.83

$$\log(x + e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))/(exp(x)+x),x, algorithm="giac")
```

```
[Out] log(x + e^x)
```

Mupad [B]
time = 0.03, size = 5, normalized size = 0.83

$$\ln\left(x+\mathrm{e}^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(x) + 1)/(x + exp(x)),x)
```

```
[Out] log(x + exp(x))
```

3.734 $\int \frac{e^{x^2}}{x^2}\,dx$

Optimal. Leaf size=19

$$-\frac{e^{x^2}}{x}+\sqrt{\pi}\,\text{erfi}(x)$$

```
[Out] -exp(x^2)/x+erfi(x)*Pi^(1/2)
```

Rubi [A]
time = 0.01, antiderivative size = 19, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {2245, 2235}

$$\sqrt{\pi}\,\text{Erfi}(x)-\frac{e^{x^2}}{x}$$

Antiderivative was successfully verified.

```
[In] Int[E^x^2/x^2,x]
```

```
[Out] -(E^x^2/x) + Sqrt[Pi]*Erfi[x]
```

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int \frac{e^{x^2}}{x^2}\,dx &= -\frac{e^{x^2}}{x}+2\int e^{x^2}\,dx\\ &= -\frac{e^{x^2}}{x}+\sqrt{\pi}\,\text{erfi}(x)\end{aligned}$$

Mathematica [A]
time = 0.02, size = 19, normalized size = 1.00

$$-\frac{e^{x^2}}{x}+\sqrt{\pi}\,\text{erfi}(x)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x^2/x^2,x]
```

```
[Out] -(E^x^2/x) + Sqrt[Pi]*Erfi[x]
```

Maple [A]
time = 0.02, size = 17, normalized size = 0.89

method	result	size
default	$-\frac{e^{x^2}}{x}+\text{erfi}\left(x\right)\sqrt{\pi}$	17
risch	$-\frac{e^{x^2}}{x}+\text{erfi}\left(x\right)\sqrt{\pi}$	17
meijerg	$\frac{i\left(\frac{2i e^{x^2}}{x}-2i\,\text{erfi}(x)\sqrt{\pi}\right)}{2}$	23

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^2)/x^2,x,method=_RETURNVERBOSE)
```

```
[Out] -exp(x^2)/x+erfi(x)*Pi^(1/2)
```

Maxima [A]
time = 0.31, size = 19, normalized size = 1.00

$$-\frac{\sqrt{-x^2}\,\Gamma\left(-\frac{1}{2},-x^2\right)}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)/x^2,x, algorithm="maxima")
```

```
[Out] -1/2*sqrt(-x^2)*gamma(-1/2, -x^2)/x
```

Fricas [A]
time = 0.35, size = 18, normalized size = 0.95

$$\frac{\sqrt{\pi}\,x\,\text{erfi}\left(x\right)-e^{\left(x^2\right)}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)/x^2,x, algorithm="fricas")
```

```
[Out] (sqrt(pi)*x*erfi(x) - e^(x^2))/x
```

Sympy [A]
time = 0.14, size = 14, normalized size = 0.74

$$\sqrt{\pi}\,\operatorname{erfi}\left(x\right)-\frac{e^{x^2}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**2)/x**2,x)
[Out] sqrt(pi)*erfi(x) - exp(x**2)/x
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)/x^2,x, algorithm="giac")
[Out] integrate(e^(x^2)/x^2, x)
```

Mupad [B]
time = 3.60, size = 21, normalized size = 1.11

$$-\frac{\mathrm{e}^{x^2}}{x}+\sqrt{\pi}\,\mathrm{erfc}(x\,1\mathrm{i})\;1\mathrm{i}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^2)/x^2,x)
[Out] pi^(1/2)*erfc(x*1i)*1i - exp(x^2)/x
```

3.735 $\int \frac{e^{x^2}(1+4x^4)}{x^2}\,dx$

Optimal. Leaf size=19

$$-\frac{e^{x^2}}{x}+2e^{x^2}x$$

[Out] -exp(x^2)/x+2*exp(x^2)*x

Rubi [A]
time = 0.07, antiderivative size = 19, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {6874, 2245, 2235, 2243}

$$2e^{x^2}x-\frac{e^{x^2}}{x}$$

Antiderivative was successfully verified.

[In] Int[(E^x^2*(1 + 4*x^4))/x^2,x]

[Out] -(E^x^2/x) + 2*E^x^2*x

Rule 2235

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[F^a*Sqrt
[Pi]*(Erfi[(c + d*x)*Rt[b*Log[F], 2]]/(2*d*Rt[b*Log[F], 2])), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2243

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m - n + 1)*(F^(a + b*(c + d*x)^n)/(b*d*n*L
og[F])), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n
)] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rule 2245

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[(c + d*x)^(m + 1)*(F^(a + b*(c + d*x)^n)/(d*(m + 1)))
, x] - Dist[b*n*(Log[F]/(m + 1)), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2*((m + 1)/n)] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{x^2}(1+4x^4)}{x^2}\,dx &= \int \left(\frac{e^{x^2}}{x^2}+4e^{x^2}x^2\right)dx\\ &= 4\int e^{x^2}x^2\,dx+\int \frac{e^{x^2}}{x^2}\,dx\\ &= -\frac{e^{x^2}}{x}+2e^{x^2}x\end{aligned}$$

Mathematica [A]
time = 0.08, size = 15, normalized size = 0.79

$$e^{x^2}\left(-\frac{1}{x}+2x\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^x^2*(1 + 4*x^4))/x^2,x]
[Out] E^x^2*(-x^(-1) + 2*x)
```

Maple [A]
time = 0.02, size = 18, normalized size = 0.95

method	result	size
gosper	$\frac{e^{x^2}(2x^2-1)}{x}$	16
risch	$\frac{e^{x^2}(2x^2-1)}{x}$	16
default	$-\frac{e^{x^2}}{x}+2\,e^{x^2}x$	18
norman	$\frac{2\,e^{x^2}x^2-e^{x^2}}{x}$	21
meijerg	$2i\left(-ix\,e^{x^2}+\frac{i\,\mathrm{erfi}(x)\sqrt{\pi}}{2}\right)+\frac{i\left(\frac{2ie^{x^2}}{x}-2i\,\mathrm{erfi}(x)\sqrt{\pi}\right)}{2}$	44

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^2)*(4*x^4+1)/x^2,x,method=_RETURNVERBOSE)
[Out] -exp(x^2)/x+2*exp(x^2)*x
```

Maxima [C] Result contains higher order function than in optimal. Order 4 vs. order 3.
time = 0.31, size = 36, normalized size = 1.89

$$2\,xe^{\left(x^2\right)} + i\,\sqrt{\pi}\,\operatorname{erf}\left(i\,x\right) - \frac{\sqrt{-x^2}\,\Gamma\left(-\frac{1}{2}, -x^2\right)}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*(4*x^4+1)/x^2,x, algorithm="maxima")
[Out] 2*x*e^(x^2) + I*sqrt(pi)*erf(I*x) - 1/2*sqrt(-x^2)*gamma(-1/2, -x^2)/x
```

Fricas [A]
time = 0.36, size = 15, normalized size = 0.79

$$\frac{\left(2\,x^2 - 1\right)e^{\left(x^2\right)}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*(4*x^4+1)/x^2,x, algorithm="fricas")
[Out] (2*x^2 - 1)*e^(x^2)/x
```

Sympy [A]
time = 0.02, size = 12, normalized size = 0.63

$$\frac{\left(2x^2 - 1\right)e^{x^2}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**2)*(4*x**4+1)/x**2,x)
[Out] (2*x**2 - 1)*exp(x**2)/x
```

Giac [A]
time = 3.52, size = 20, normalized size = 1.05

$$\frac{2\,x^2e^{\left(x^2\right)} - e^{\left(x^2\right)}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*(4*x^4+1)/x^2,x, algorithm="giac")
[Out] (2*x^2*e^(x^2) - e^(x^2))/x
```

Mupad [B]
time = 0.07, size = 15, normalized size = 0.79

$$\frac{e^{x^2}\left(2\,x^2 - 1\right)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(x^2)*(4*x^4 + 1))/x^2,x)
[Out] (exp(x^2)*(2*x^2 - 1))/x
```

3.736 $\int \sqrt{f^x} (a+bx)^2 \, dx$

Optimal. Leaf size=56

$$\frac{16b^2\sqrt{f^x}}{\log^3(f)}-\frac{8b\sqrt{f^x}\,(a+bx)}{\log^2(f)}+\frac{2\sqrt{f^x}\,(a+bx)^2}{\log(f)}$$

```
[Out] 16*b^2*(f^x)^(1/2)/ln(f)^3-8*b*(b*x+a)*(f^x)^(1/2)/ln(f)^2+2*(b*x+a)^2*(f^x
)^(1/2)/ln(f)
```

Rubi [A]
time = 0.03, antiderivative size = 56, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {2207, 2225}

$$-\frac{8b\sqrt{f^x}\,(a+bx)}{\log^2(f)}+\frac{2\sqrt{f^x}\,(a+bx)^2}{\log(f)}+\frac{16b^2\sqrt{f^x}}{\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[f^x]*(a + b*x)^2,x]
```

```
[Out] (16*b^2*Sqrt[f^x])/Log[f]^3 - (8*b*Sqrt[f^x]*(a + b*x))/Log[f]^2 + (2*Sqrt[
f^x]*(a + b*x)^2)/Log[f]
```

Rule 2207

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[(c + d*x)^m*((b*F^(g*(e + f*x)))^n/(f*g*n*Log[F])),
x] - Dist[d*(m/(f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !TrueQ[$UseGamma]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned}\int \sqrt{f^x}\,(a+bx)^2\,dx &= \frac{2\sqrt{f^x}\,(a+bx)^2}{\log(f)}-\frac{(4b)\int \sqrt{f^x}\,(a+bx)\,dx}{\log(f)}\\ &= -\frac{8b\sqrt{f^x}\,(a+bx)}{\log^2(f)}+\frac{2\sqrt{f^x}\,(a+bx)^2}{\log(f)}+\frac{(8b^2)\int \sqrt{f^x}\,dx}{\log^2(f)}\\ &= \frac{16b^2\sqrt{f^x}}{\log^3(f)}-\frac{8b\sqrt{f^x}\,(a+bx)}{\log^2(f)}+\frac{2\sqrt{f^x}\,(a+bx)^2}{\log(f)}\end{aligned}$$

Mathematica [A]
time = 0.04, size = 41, normalized size = 0.73

$$\frac{2\sqrt{f^x}\left(8b^2-4b(a+bx)\log(f)+(a+bx)^2\log^2(f)\right)}{\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[f^x]*(a + b*x)^2,x]
[Out] (2*Sqrt[f^x]*(8*b^2 - 4*b*(a + b*x)*Log[f] + (a + b*x)^2*Log[f]^2))/Log[f]^
3
```

Maple [A]
time = 0.08, size = 60, normalized size = 1.07

method	result
gosper	$\frac{2\left(b^2x^2\ln(f)^2+2\ln(f)^2abx+\ln(f)^2a^2-4\ln(f)b^2x-4\ln(f)ba+8b^2\right)\sqrt{f^x}}{\ln(f)^3}$
risch	$\frac{2\left(b^2x^2\ln(f)^2+2\ln(f)^2abx+\ln(f)^2a^2-4\ln(f)b^2x-4\ln(f)ba+8b^2\right)\sqrt{f^x}}{\ln(f)^3}$
meijerg	$-\frac{8b^2\sqrt{f^x}\,f^{-\frac{x}{2}}\left(2-\frac{\left(\frac{3\ln(f)^2x^2}{4}-3x\ln(f)+6\right)e^{\frac{x\ln(f)}{2}}}{3}\right)}{\ln(f)^3}+\frac{8ba\sqrt{f^x}\,f^{-\frac{x}{2}}\left(1-\frac{(2-x\ln(f))e^{\frac{x\ln(f)}{2}}}{2}\right)}{\ln(f)^2}-\frac{2a^2\sqrt{f^x}\,f^{-\frac{x}{2}}\left(1-e\right.}{\ln(f)}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^2*(f^x)^(1/2),x,method=_RETURNVERBOSE)
[Out] 2*(b^2*x^2*ln(f)^2+2*ln(f)^2*a*b*x+ln(f)^2*a^2-4*ln(f)*b^2*x-4*ln(f)*b*a+8*
b^2)*(f^x)^(1/2)/ln(f)^3
```

Maxima [A]
time = 0.28, size = 63, normalized size = 1.12

$$\frac{4\,(x\log{(f)}-2)abf^{\frac{1}{2}\,x}}{\log{(f)}^2}+\frac{2\,a^2f^{\frac{1}{2}\,x}}{\log{(f)}}+\frac{2\,\left(x^2\log{(f)}^2-4\,x\log{(f)}+8\right)b^2f^{\frac{1}{2}\,x}}{\log{(f)}^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(f^x)^(1/2),x, algorithm="maxima")
[Out] 4*(x*log(f) - 2)*a*b*f^(1/2*x)/log(f)^2 + 2*a^2*f^(1/2*x)/log(f) + 2*(x^2*l
og(f)^2 - 4*x*log(f) + 8)*b^2*f^(1/2*x)/log(f)^3
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(f^x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

Sympy [A]
time = 0.06, size = 94, normalized size = 1.68

$$\begin{cases} \frac{\left(2a^2\log{(f)}^2+4abx\log{(f)}^2-8ab\log{(f)}+2b^2x^2\log{(f)}^2-8b^2x\log{(f)}+16b^2\right)\sqrt{f^x}}{\log{(f)}^3} & \text{for}\ \log{(f)}^3\neq 0 \\ a^2x+abx^2+\frac{b^2x^3}{3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**2*(f**x)**(1/2),x)
```

```
[Out] Piecewise(((2*a**2*log(f)**2 + 4*a*b*x*log(f)**2 - 8*a*b*log(f) + 2*b**2*x*
*2*log(f)**2 - 8*b**2*x*log(f) + 16*b**2)*sqrt(f**x)/log(f)**3, Ne(log(f)**
3, 0)), (a**2*x + a*b*x**2 + b**2*x**3/3, True))
```

Giac [C] Result contains complex when optimal does not.
time = 5.52, size = 1392, normalized size = 24.86

Too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(f^x)^(1/2),x, algorithm="giac")
```

```
[Out] -2*((2*(pi*b^2*x^2*log(abs(f))*sgn(f) - pi*b^2*x^2*log(abs(f)) + 2*pi*a*b*x
*log(abs(f))*sgn(f) - 2*pi*a*b*x*log(abs(f)) - 2*pi*b^2*x*sgn(f) + pi*a^2*l
og(abs(f))*sgn(f) + 2*pi*b^2*x - pi*a^2*log(abs(f)) - 2*pi*a*b*sgn(f) + 2*p
i*a*b)*(pi^3*sgn(f) - 3*pi*log(abs(f))^2*sgn(f) - pi^3 + 3*pi*log(abs(f))^2
)/((pi^3*sgn(f) - 3*pi*log(abs(f))^2*sgn(f) - pi^3 + 3*pi*log(abs(f))^2)^2
+ (3*pi^2*log(abs(f))*sgn(f) - 3*pi^2*log(abs(f)) + 2*log(abs(f))^3)^2) - (
pi^2*b^2*x^2*sgn(f) - pi^2*b^2*x^2 + 2*b^2*x^2*log(abs(f))^2 + 2*pi^2*a*b*x
*sgn(f) - 2*pi^2*a*b*x + 4*a*b*x*log(abs(f))^2 + pi^2*a^2*sgn(f) - pi^2*a^2
 - 8*b^2*x*log(abs(f)) + 2*a^2*log(abs(f))^2 - 8*a*b*log(abs(f)) + 16*b^2)*
(3*pi^2*log(abs(f))*sgn(f) - 3*pi^2*log(abs(f)) + 2*log(abs(f))^3)/((pi^3*s
gn(f) - 3*pi*log(abs(f))^2*sgn(f) - pi^3 + 3*pi*log(abs(f))^2)^2 + (3*pi^2*
log(abs(f))*sgn(f) - 3*pi^2*log(abs(f)) + 2*log(abs(f))^3)^2))*cos(-1/4*pi*
x*sgn(f) + 1/4*pi*x) - ((pi^2*b^2*x^2*sgn(f) - pi^2*b^2*x^2 + 2*b^2*x^2*log
(abs(f))^2 + 2*pi^2*a*b*x*sgn(f) - 2*pi^2*a*b*x + 4*a*b*x*log(abs(f))^2 + p
i^2*a^2*sgn(f) - pi^2*a^2 - 8*b^2*x*log(abs(f)) + 2*a^2*log(abs(f))^2 - 8*a
*b*log(abs(f)) + 16*b^2)*(pi^3*sgn(f) - 3*pi*log(abs(f))^2*sgn(f) - pi^3 +
3*pi*log(abs(f))^2)/((pi^3*sgn(f) - 3*pi*log(abs(f))^2*sgn(f) - pi^3 + 3*pi
```

```
*log(abs(f))^2)^2 + (3*pi^2*log(abs(f))*sgn(f) - 3*pi^2*log(abs(f)) + 2*log
(abs(f))^3)^2) + 2*(pi*b^2*x^2*log(abs(f))*sgn(f) - pi*b^2*x^2*log(abs(f))
+ 2*pi*a*b*x*log(abs(f))*sgn(f) - 2*pi*a*b*x*log(abs(f)) - 2*pi*b^2*x*sgn(f
) + pi*a^2*log(abs(f))*sgn(f) + 2*pi*b^2*x - pi*a^2*log(abs(f)) - 2*pi*a*b*
sgn(f) + 2*pi*a*b)*(3*pi^2*log(abs(f))*sgn(f) - 3*pi^2*log(abs(f)) + 2*log(
abs(f))^3)/((pi^3*sgn(f) - 3*pi*log(abs(f))^2*sgn(f) - pi^3 + 3*pi*log(abs(
f))^2)^2 + (3*pi^2*log(abs(f))*sgn(f) - 3*pi^2*log(abs(f)) + 2*log(abs(f))^
3)^2))*sin(-1/4*pi*x*sgn(f) + 1/4*pi*x))*abs(f)^(1/2*x) - 4*I*abs(f)^(1/2*x
)*((-I*pi^2*b^2*x^2*sgn(f) + 2*pi*b^2*x^2*log(abs(f))*sgn(f) + I*pi^2*b^2*x
^2 - 2*pi*b^2*x^2*log(abs(f)) - 2*I*b^2*x^2*log(abs(f))^2 - 2*I*pi^2*a*b*x*
sgn(f) + 4*pi*a*b*x*log(abs(f))*sgn(f) + 2*I*pi^2*a*b*x - 4*pi*a*b*x*log(ab
s(f)) - 4*I*a*b*x*log(abs(f))^2 - I*pi^2*a^2*sgn(f) - 4*pi*b^2*x*sgn(f) + 2
*pi*a^2*log(abs(f))*sgn(f) + I*pi^2*a^2 + 4*pi*b^2*x - 2*pi*a^2*log(abs(f))
 + 8*I*b^2*x*log(abs(f)) - 2*I*a^2*log(abs(f))^2 - 4*pi*a*b*sgn(f) + 4*pi*a
*b + 8*I*a*b*log(abs(f)) - 16*I*b^2)*e^(1/4*I*pi*x*sgn(f) - 1/4*I*pi*x)/(-4
*I*pi^3*sgn(f) + 12*pi^2*log(abs(f))*sgn(f) + 12*I*pi*log(abs(f))^2*sgn(f)
+ 4*I*pi^3 - 12*pi^2*log(abs(f)) - 12*I*pi*log(abs(f))^2 + 8*log(abs(f))^3)
 - (-I*pi^2*b^2*x^2*sgn(f) - 2*pi*b^2*x^2*log(abs(f))*sgn(f) + I*pi^2*b^2*x
^2 + 2*pi*b^2*x^2*log(abs(f)) - 2*I*b^2*x^2*log(abs(f))^2 - 2*I*pi^2*a*b*x*
sgn(f) - 4*pi*a*b*x*log(abs(f))*sgn(f) + 2*I*pi^2*a*b*x + 4*pi*a*b*x*log(ab
s(f)) - 4*I*a*b*x*log(abs(f))^2 - I*pi^2*a^2*sgn(f) + 4*pi*b^2*x*sgn(f) - 2
*pi*a^2*log(abs(f))*sgn(f) + I*pi^2*a^2 - 4*pi*b^2*x + 2*pi*a^2*log(abs(f))
 + 8*I*b^2*x*log(abs(f)) - 2*I*a^2*log(abs(f))^2 + 4*pi*a*b*sgn(f) - 4*pi*a
*b + 8*I*a*b*log(abs(f)) - 16*I*b^2)*e^(-1/4*I*pi*x*sgn(f) + 1/4*I*pi*x)/(4
*I*pi^3*sgn(f) + 12*pi^2*log(abs(f))*sgn(f) - 12*I*pi*log(abs(f))^2*sgn(f)
- 4*I*pi^3 - 12*pi^2*log(abs(f)) + 12*I*pi*log(abs(f))^2 + 8*log(abs(f))^3)
)
```

Mupad [B]
time = 3.67, size = 62, normalized size = 1.11

$$\sqrt{f^x}\,\left(\frac{2\,a^2\,\ln\left(f\right)^2-8\,a\,b\,\ln\left(f\right)+16\,b^2}{\ln\left(f\right)^3}+\frac{2\,b^2\,x^2}{\ln\left(f\right)}-\frac{4\,b\,x\,\left(2\,b-a\,\ln\left(f\right)\right)}{\ln\left(f\right)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f^x)^(1/2)*(a + b*x)^2,x)
[Out] (f^x)^(1/2)*((2*a^2*log(f)^2 + 16*b^2 - 8*a*b*log(f))/log(f)^3 + (2*b^2*x^2
)/log(f) - (4*b*x*(2*b - a*log(f)))/log(f)^2)
```

3.737 $\int 3^{1+x^2} x \, dx$

Optimal. Leaf size=15

$$\frac{3^{1+x^2}}{2\log(3)}$$

```
[Out] 1/2*3^(x^2+1)/ln(3)
```

Rubi [A]
time = 0.01, antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = $\{2240\}$

$$\frac{3^{x^2+1}}{2\log(3)}$$

Antiderivative was successfully verified.

```
[In] Int[3^(1 + x^2)*x,x]
```

```
[Out] 3^(1 + x^2)/(2*Log[3])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int 3^{1+x^2} x \, dx = \frac{3^{1+x^2}}{2\log(3)}$$

Mathematica [A]
time = 0.03, size = 12, normalized size = 0.80

$$\frac{3^{1+x^2}}{\log(9)}$$

Antiderivative was successfully verified.

```
[In] Integrate[3^(1 + x^2)*x,x]
```

```
[Out] 3^(1 + x^2)/Log[9]
```

Maple [A]
time = 0.02, size = 14, normalized size = 0.93

method	result	size
gosper	$\frac{3^{x^2+1}}{2\ln(3)}$	14
derivativedivides	$\frac{3^{x^2+1}}{2\ln(3)}$	14
default	$\frac{3^{x^2+1}}{2\ln(3)}$	14
risch	$\frac{3^{x^2+1}}{2\ln(3)}$	14
norman	$\frac{e^{\left(x^2+1\right)\ln(3)}}{2\ln(3)}$	16
meijerg	$-\frac{3\left(1-e^{\ln(3)x^2}\right)}{2\ln(3)}$	18

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(3^(x^2+1)*x,x,method=_RETURNVERBOSE)
[Out] 1/2*3^(x^2+1)/ln(3)
```

Maxima [A]
time = 0.29, size = 13, normalized size = 0.87

$$\frac{3^{x^2+1}}{2\log(3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(3^(x^2+1)*x,x, algorithm="maxima")
[Out] 1/2*3^(x^2 + 1)/log(3)
```

Fricas [A]
time = 0.35, size = 13, normalized size = 0.87

$$\frac{3^{x^2+1}}{2\log(3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(3^(x^2+1)*x,x, algorithm="fricas")
[Out] 1/2*3^(x^2 + 1)/log(3)
```

Sympy [A]
time = 0.03, size = 10, normalized size = 0.67

$$\frac{3^{x^2+1}}{2\log(3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(3**(x**2+1)*x,x)
```

```
[Out] 3**(x**2 + 1)/(2*log(3))
```

Giac [A]
time = 4.13, size = 13, normalized size = 0.87

$$\frac{3^{x^2+1}}{2 \log(3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(3^(x^2+1)*x,x, algorithm="giac")
```

```
[Out] 1/2*3^(x^2 + 1)/log(3)
```

Mupad [B]
time = 3.50, size = 11, normalized size = 0.73

$$\frac{3\,3^{x^2}}{2 \ln(3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(3^(x^2 + 1)*x,x)
```

```
[Out] (3*3^(x^2))/(2*log(3))
```

3.738 $\int \frac{2^{\sqrt{x}}}{\sqrt{x}} \, dx$

Optimal. Leaf size=14

$$\frac{2^{1+\sqrt{x}}}{\log(2)}$$

```
[Out] 2^(1+x^(1/2))/ln(2)
```

Rubi [A]
time = 0.01, antiderivative size = 14, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2240}

$$\frac{2^{\sqrt{x}+1}}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^Sqrt[x]/Sqrt[x],x]
```

```
[Out] 2^(1 + Sqrt[x])/Log[2]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{2^{\sqrt{x}}}{\sqrt{x}} \, dx = \frac{2^{1+\sqrt{x}}}{\log(2)}$$

Mathematica [A]
time = 0.00, size = 14, normalized size = 1.00

$$\frac{2^{1+\sqrt{x}}}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^Sqrt[x]/Sqrt[x],x]
```

```
[Out] 2^(1 + Sqrt[x])/Log[2]
```

Maple [A]
time = 0.02, size = 12, normalized size = 0.86

method	result	size
derivativedivides	$\frac{2\,2^{\sqrt{x}}}{\ln(2)}$	12
default	$\frac{2\,2^{\sqrt{x}}}{\ln(2)}$	12
meijerg	$-\frac{2\left(1-\mathrm{e}^{\sqrt{x}\,\ln(2)}\right)}{\ln(2)}$	18

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(x^(1/2))/x^(1/2),x,method=_RETURNVERBOSE)
[Out] 2*2^(x^(1/2))/ln(2)
```

Maxima [A]
time = 0.29, size = 12, normalized size = 0.86

$$\frac{2^{\sqrt{x}+1}}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(x^(1/2))/x^(1/2),x, algorithm="maxima")
[Out] 2^(sqrt(x) + 1)/log(2)
```

Fricas [A]
time = 0.34, size = 11, normalized size = 0.79

$$\frac{2 \cdot 2^{\left(\sqrt{x}\right)}}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(x^(1/2))/x^(1/2),x, algorithm="fricas")
[Out] 2*2^sqrt(x)/log(2)
```

Sympy [A]
time = 0.05, size = 10, normalized size = 0.71

$$\frac{2 \cdot 2^{\sqrt{x}}}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**(x**(1/2))/x**(1/2),x)
```

```
[Out] 2*2**(sqrt(x))/log(2)
```

Giac [A]
time = 6.25, size = 11, normalized size = 0.79

$$\frac{2 \cdot 2^{(\sqrt{x})}}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(x^(1/2))/x^(1/2),x, algorithm="giac")
```

```
[Out] 2*2^sqrt(x)/log(2)
```

Mupad [B]
time = 3.59, size = 11, normalized size = 0.79

$$\frac{2\,2^{\sqrt{x}}}{\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(x^(1/2))/x^(1/2),x)
```

```
[Out] (2*2^(x^(1/2)))/log(2)
```

3.739 $\int \frac{2^{\frac{1}{x}}}{x^2} \, dx$

Optimal. Leaf size=11

$$-\frac{2^{\frac{1}{x}}}{\log(2)}$$

```
[Out] -2^(1/x)/ln(2)
```

Rubi [A]
time = 0.01, antiderivative size = 11, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = $\{2240\}$

$$-\frac{2^{\frac{1}{x}}}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x^(-1)/x^2,x]
```

```
[Out] -(2^x^(-1)/Log[2])
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{2^{\frac{1}{x}}}{x^2} \, dx = -\frac{2^{\frac{1}{x}}}{\log(2)}$$

Mathematica [A]
time = 0.00, size = 11, normalized size = 1.00

$$-\frac{2^{\frac{1}{x}}}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x^(-1)/x^2,x]
```

```
[Out] -(2^x^(-1)/Log[2])
```

Maple [A]
time = 0.02, size = 12, normalized size = 1.09

method	result	size
gosper	$-\frac{2^{\frac{1}{x}}}{\ln(2)}$	12
derivativedivides	$-\frac{2^{\frac{1}{x}}}{\ln(2)}$	12
default	$-\frac{2^{\frac{1}{x}}}{\ln(2)}$	12
risch	$-\frac{2^{\frac{1}{x}}}{\ln(2)}$	12
norman	$-\frac{e^{\frac{\ln(2)}{x}}}{\ln(2)}$	14
meijerg	$\frac{1-e^{\frac{\ln(2)}{x}}}{\ln(2)}$	17

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(1/x)/x^2,x,method=_RETURNVERBOSE)
[Out] -2^(1/x)/ln(2)
```

Maxima [A]
time = 0.28, size = 11, normalized size = 1.00

$$-\frac{2^{\left(\frac{1}{x}\right)}}{\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(1/x)/x^2,x, algorithm="maxima")
[Out] -2^(1/x)/log(2)
```

Fricas [A]
time = 0.38, size = 11, normalized size = 1.00

$$-\frac{2^{\left(\frac{1}{x}\right)}}{\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(1/x)/x^2,x, algorithm="fricas")
[Out] -2^(1/x)/log(2)
```

Sympy [A]
time = 0.03, size = 8, normalized size = 0.73

$$-\frac{2^{\frac{1}{x}}}{\log{(2)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**(1/x)/x**2,x)
```

```
[Out] -2**(1/x)/log(2)
```

Giac [A]
time = 4.62, size = 11, normalized size = 1.00

$$-\frac{2^{\left(\frac{1}{x}\right)}}{\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(1/x)/x^2,x, algorithm="giac")
```

```
[Out] -2^(1/x)/log(2)
```

Mupad [B]
time = 3.50, size = 11, normalized size = 1.00

$$-\frac{2^{1/x}}{\ln\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(1/x)/x^2,x)
```

```
[Out] -2^(1/x)/log(2)
```

3.740 $\int (2^{-x}+2^x)\,dx$

Optimal. Leaf size=20

$$-\frac{2^{-x}}{\log(2)}+\frac{2^x}{\log(2)}$$

```
[Out] -1/(2^x)/ln(2)+2^x/ln(2)
```

Rubi [A]
time = 0.00, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2225}

$$\frac{2^x}{\log(2)}-\frac{2^{-x}}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^(-x) + 2^x,x]
```

```
[Out] -(1/(2^x*Log[2])) + 2^x/Log[2]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned}\int (2^{-x}+2^x)\,dx &= \int 2^{-x}\,dx+\int 2^x\,dx\\ &= -\frac{2^{-x}}{\log(2)}+\frac{2^x}{\log(2)}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 20, normalized size = 1.00

$$-\frac{2^{-x}}{\log(2)}+\frac{2^x}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^(-x) + 2^x,x]
```

```
[Out] -(1/(2^x*Log[2])) + 2^x/Log[2]
```

Maple [A]
time = 0.02, size = 21, normalized size = 1.05

method	result	size
derivativedivides	$\frac{2^{x}-2^{-x}}{\ln(2)}$	17
risch	$\frac{(2^{2x}-1)2^{-x}}{\ln(2)}$	18
default	$-\frac{2^{-x}}{\ln(2)}+\frac{2^{x}}{\ln(2)}$	21
norman	$\left(\frac{e^{2x\ln(2)}}{\ln(2)}-\frac{1}{\ln(2)}\right)e^{-x\ln(2)}$	28
meijerg	$\frac{1-e^{-x\ln(2)}}{\ln(2)}-\frac{1-e^{x\ln(2)}}{\ln(2)}$	32

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(2^x)+2^x,x,method=_RETURNVERBOSE)
```

```
[Out] -1/(2^x)/ln(2)+2^x/ln(2)
```

Maxima [A]
time = 0.28, size = 20, normalized size = 1.00

$$\frac{2^{x}}{\log(2)}-\frac{1}{2^{x}\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2^x)+2^x,x, algorithm="maxima")
```

```
[Out] 2^x/log(2) - 1/(2^x*log(2))
```

Fricas [A]
time = 0.34, size = 17, normalized size = 0.85

$$\frac{2^{2x}-1}{2^{x}\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2^x)+2^x,x, algorithm="fricas")
```

```
[Out] (2^(2*x) - 1)/(2^x*log(2))
```

Sympy [A]
time = 0.04, size = 17, normalized size = 0.85

$$\frac{2^{x}\log(2)-2^{-x}\log(2)}{\log(2)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2**x)+2**x,x)
```

```
[Out] (2**x*log(2) - log(2)/2**x)/log(2)**2
```

Giac [A]
time = 4.78, size = 20, normalized size = 1.00

$$\frac{2^{x}}{\log\left(2\right)}-\frac{1}{2^{x}\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2^x)+2^x,x, algorithm="giac")
```

```
[Out] 2^x/log(2) - 1/(2^x*log(2))
```

Mupad [B]
time = 3.45, size = 17, normalized size = 0.85

$$\frac{2^{2\,x}-1}{2^{x}\,\ln\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/2^x + 2^x,x)
```

```
[Out] (2^(2*x) - 1)/(2^x*log(2))
```

3.741 $\int e^{-4x}(2-3x+x^2)\,dx$

Optimal. Leaf size=32

$$-\frac{11}{32}e^{-4x}+\frac{5}{8}e^{-4x}x-\frac{1}{4}e^{-4x}x^2$$

```
[Out] -11/32/exp(4*x)+5/8*x/exp(4*x)-1/4*x^2/exp(4*x)
```

Rubi [A]
time = 0.03, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 3, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}=0.214$, Rules used = {2227, 2225, 2207}

$$-\frac{1}{4}e^{-4x}x^2+\frac{5}{8}e^{-4x}x-\frac{11e^{-4x}}{32}$$

Antiderivative was successfully verified.

```
[In] Int[(2 - 3*x + x^2)/E^(4*x),x]
```

```
[Out] -11/(32*E^(4*x)) + (5*x)/(8*E^(4*x)) - x^2/(4*E^(4*x))
```

Rule 2207

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[(c + d*x)^m*((b*F^(g*(e + f*x)))^n/(f*g*n*Log[F])),
x] - Dist[d*(m/(f*g*n*Log[F])), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !TrueQ[$UseGamma]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2227

```
Int[(F_)^((c_.)*(v_))*(u_), x_Symbol] :> Int[ExpandIntegrand[F^(c*ExpandToS
um[v, x]), u, x], x] /; FreeQ[{F, c}, x] && PolynomialQ[u, x] && LinearQ[v,
 x] &&  !TrueQ[$UseGamma]
```

Rubi steps

$$\begin{aligned}\int e^{-4x}(2-3x+x^2)\,dx &= \int \left(2e^{-4x}-3e^{-4x}x+e^{-4x}x^2\right)\,dx\\ &= 2\int e^{-4x}\,dx - 3\int e^{-4x}x\,dx + \int e^{-4x}x^2\,dx\\ &= -\frac{1}{2}e^{-4x}+\frac{3}{4}e^{-4x}x-\frac{1}{4}e^{-4x}x^2+\frac{1}{2}\int e^{-4x}x\,dx-\frac{3}{4}\int e^{-4x}\,dx\\ &= -\frac{5}{16}e^{-4x}+\frac{5}{8}e^{-4x}x-\frac{1}{4}e^{-4x}x^2+\frac{1}{8}\int e^{-4x}\,dx\\ &= -\frac{11}{32}e^{-4x}+\frac{5}{8}e^{-4x}x-\frac{1}{4}e^{-4x}x^2\end{aligned}$$

Mathematica [A]
time = 0.05, size = 19, normalized size = 0.59

$$-\frac{1}{32}e^{-4x}\left(11-20x+8x^2\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(2 - 3*x + x^2)/E^(4*x),x]
[Out] -1/32*(11 - 20*x + 8*x^2)/E^(4*x)
```

Maple [A]
time = 0.02, size = 30, normalized size = 0.94

method	result	size
risch	$\left(-\frac{1}{4}x^2+\frac{5}{8}x-\frac{11}{32}\right)\mathrm{e}^{-4x}$	16
norman	$\left(-\frac{1}{4}x^2+\frac{5}{8}x-\frac{11}{32}\right)\mathrm{e}^{-4x}$	18
gosper	$-\frac{(8x^2-20x+11)\mathrm{e}^{-4x}}{32}$	19
derivativedivides	$-\frac{11\,\mathrm{e}^{-4x}}{32}+\frac{5x\,\mathrm{e}^{-4x}}{8}-\frac{x^2\mathrm{e}^{-4x}}{4}$	30
default	$-\frac{11\,\mathrm{e}^{-4x}}{32}+\frac{5x\,\mathrm{e}^{-4x}}{8}-\frac{x^2\mathrm{e}^{-4x}}{4}$	30
meijerg	$\frac{11}{32}-\frac{(48x^2+24x+6)\mathrm{e}^{-4x}}{192}+\frac{3(2+8x)\mathrm{e}^{-4x}}{32}-\frac{\mathrm{e}^{-4x}}{2}$	36

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2-3*x+2)/exp(4*x),x,method=_RETURNVERBOSE)
[Out] -11/32/exp(4*x)+5/8*x/exp(4*x)-1/4*x^2/exp(4*x)
```

Maxima [A]
time = 0.28, size = 34, normalized size = 1.06

$$-\frac{1}{32}\left(8\,x^2+4\,x+1\right)e^{(-4\,x)}+\frac{3}{16}\left(4\,x+1\right)e^{(-4\,x)}-\frac{1}{2}\,e^{(-4\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((x^2-3*x+2)/exp(4*x),x, algorithm="maxima")
[Out] -1/32*(8*x^2 + 4*x + 1)*e^(-4*x) + 3/16*(4*x + 1)*e^(-4*x) - 1/2*e^(-4*x)
```

Fricas [A]
time = 0.36, size = 16, normalized size = 0.50

$$-\frac{1}{32}\left(8\,x^{2}-20\,x+11\right)e^{\left(-4\,x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((x^2-3*x+2)/exp(4*x),x, algorithm="fricas")
[Out] -1/32*(8*x^2 - 20*x + 11)*e^(-4*x)
```

Sympy [A]
time = 0.02, size = 15, normalized size = 0.47

$$\frac{\left(-8x^{2}+20x-11\right)e^{-4x}}{32}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((x**2-3*x+2)/exp(4*x),x)
[Out] (-8*x**2 + 20*x - 11)*exp(-4*x)/32
```

Giac [A]
time = 4.95, size = 16, normalized size = 0.50

$$-\frac{1}{32}\left(8\,x^{2}-20\,x+11\right)e^{\left(-4\,x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((x^2-3*x+2)/exp(4*x),x, algorithm="giac")
[Out] -1/32*(8*x^2 - 20*x + 11)*e^(-4*x)
```

Mupad [B]
time = 0.05, size = 16, normalized size = 0.50

$$-\frac{\mathrm{e}^{-4\,x}\,\left(8\,x^{2}-20\,x+11\right)}{32}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-4*x)*(x^2 - 3*x + 2),x)
[Out] -(exp(-4*x)*(8*x^2 - 20*x + 11))/32
```

3.742 $\int \left(k^{x/2}+x^{\sqrt{k}}\right) dx$

Optimal. Leaf size=33

$$\frac{x^{1+\sqrt{k}}}{1+\sqrt{k}}+\frac{2k^{x/2}}{\log(k)}$$

```
[Out] 2*k^(1/2*x)/ln(k)+x^(1+k^(1/2))/(1+k^(1/2))
```

Rubi [A]
time = 0.01, antiderivative size = 33, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {2225}

$$\frac{2k^{x/2}}{\log(k)}+\frac{x^{\sqrt{k}+1}}{\sqrt{k}+1}$$

Antiderivative was successfully verified.

```
[In] Int[k^(x/2) + x^Sqrt[k],x]
```

```
[Out] x^(1 + Sqrt[k])/(1 + Sqrt[k]) + (2*k^(x/2))/Log[k]
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned}\int \left(k^{x/2}+x^{\sqrt{k}}\right) dx &= \frac{x^{1+\sqrt{k}}}{1+\sqrt{k}}+\int k^{x/2}\,dx\\ &= \frac{x^{1+\sqrt{k}}}{1+\sqrt{k}}+\frac{2k^{x/2}}{\log(k)}\end{aligned}$$

Mathematica [A]
time = 0.02, size = 33, normalized size = 1.00

$$\frac{x^{1+\sqrt{k}}}{1+\sqrt{k}}+\frac{2k^{x/2}}{\log(k)}$$

Antiderivative was successfully verified.

```
[In] Integrate[k^(x/2) + x^Sqrt[k],x]
```

```
[Out] x^(1 + Sqrt[k])/(1 + Sqrt[k]) + (2*k^(x/2))/Log[k]
```

Maple [A]
time = 0.04, size = 28, normalized size = 0.85

method	result	size
default	$\frac{2k^{\frac{x}{2}}}{\ln(k)}+\frac{x^{1+\sqrt{k}}}{1+\sqrt{k}}$	28
norman	$\frac{x\,\mathrm{e}^{\sqrt{k}\,\ln(x)}}{1+\sqrt{k}}+\frac{2\,\mathrm{e}^{\frac{x\ln(k)}{2}}}{\ln(k)}$	30
risch	$\frac{2k^{\frac{x}{2}}}{\ln(k)}+\frac{\left(\sqrt{k}-1\right)x\,x^{\sqrt{k}}}{k-1}$	30

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(k^(1/2*x)+x^(k^(1/2)),x,method=_RETURNVERBOSE)
[Out] 2*k^(1/2*x)/ln(k)+x^(1+k^(1/2))/(1+k^(1/2))
```

Maxima [A]
time = 0.28, size = 27, normalized size = 0.82

$$\frac{x^{\sqrt{k}+1}}{\sqrt{k}+1}+\frac{2\,k^{\frac{1}{2}\,x}}{\log\left(k\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(k^(1/2*x)+x^(k^(1/2)),x, algorithm="maxima")
[Out] x^(sqrt(k) + 1)/(sqrt(k) + 1) + 2*k^(1/2*x)/log(k)
```

Fricas [A]
time = 0.37, size = 40, normalized size = 1.21

$$\frac{2\,(k-1)k^{\frac{1}{2}\,x}+\left(\sqrt{k}\,x\log\left(k\right)-x\log\left(k\right)\right)x^{\left(\sqrt{k}\right)}}{(k-1)\log\left(k\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(k^(1/2*x)+x^(k^(1/2)),x, algorithm="fricas")
[Out] (2*(k - 1)*k^(1/2*x) + (sqrt(k)*x*log(k) - x*log(k))*x^sqrt(k))/((k - 1)*lo
g(k))
```

Sympy [A]
time = 0.03, size = 36, normalized size = 1.09

$$\begin{cases}\frac{2k^{\frac{x}{2}}}{\log\left(k\right)} & \text{for}\ \log\left(k\right)\neq 0\\ x & \text{otherwise}\end{cases}+\begin{cases}\frac{x^{\sqrt{k}+1}}{\sqrt{k}+1} & \text{for}\ \sqrt{k}\neq -1\\ \log\left(x\right) & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(k**(1/2*x)+x**(k**(1/2)),x)
```

```
[Out] Piecewise((2*k**(x/2)/log(k), Ne(log(k), 0)), (x, True)) + Piecewise((x**(s
qrt(k) + 1)/(sqrt(k) + 1), Ne(sqrt(k), -1)), (log(x), True))
```

Giac [A]
time = 5.43, size = 27, normalized size = 0.82

$$\frac{x^{\sqrt{k}+1}}{\sqrt{k}+1}+\frac{2\sqrt{k^x}}{\log(k)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(k^(1/2*x)+x^(k^(1/2)),x, algorithm="giac")
```

```
[Out] x^(sqrt(k) + 1)/(sqrt(k) + 1) + 2*sqrt(k^x)/log(k)
```

Mupad [B]
time = 3.63, size = 26, normalized size = 0.79

$$\frac{2\,k^{x/2}}{\ln(k)}+\frac{x\,x^{\sqrt{k}}}{\sqrt{k}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(k^(x/2) + x^(k^(1/2)),x)
```

```
[Out] (2*k^(x/2))/log(k) + (x*x^(k^(1/2)))/(k^(1/2) + 1)
```

3.743 $\int \frac{10^{\sqrt{x}}}{\sqrt{x}}\,dx$

Optimal. Leaf size=21

$$\frac{2^{1+\sqrt{x}}5^{\sqrt{x}}}{\log(10)}$$

[Out] 2^(1+x^(1/2))*5^(x^(1/2))/ln(10)

Rubi [A]
time = 0.01, antiderivative size = 21, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2240}

$$\frac{2^{\sqrt{x}+1}5^{\sqrt{x}}}{\log(10)}$$

Antiderivative was successfully verified.

[In] Int[10^Sqrt[x]/Sqrt[x],x]

[Out] (2^(1 + Sqrt[x])*5^Sqrt[x])/Log[10]

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(e + f*x)^n*(F^(a + b*(c + d*x)^n)/(b*f*n*(c + d*x)^n
*Log[F])), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{10^{\sqrt{x}}}{\sqrt{x}}\,dx = \frac{2^{1+\sqrt{x}}5^{\sqrt{x}}}{\log(10)}$$

Mathematica [A]
time = 0.00, size = 21, normalized size = 1.00

$$\frac{2^{1+\sqrt{x}}5^{\sqrt{x}}}{\log(10)}$$

Antiderivative was successfully verified.

[In] Integrate[10^Sqrt[x]/Sqrt[x],x]

```
[Out] (2^(1 + Sqrt[x])*5^Sqrt[x])/Log[10]
```

Maple [A]
time = 0.03, size = 12, normalized size = 0.57

method	result	size
derivativedivides	$\frac{2\,10^{\sqrt{x}}}{\ln(10)}$	12
default	$\frac{2\,10^{\sqrt{x}}}{\ln(10)}$	12
meijerg	$-\frac{2\left(1-\mathrm{e}^{\sqrt{x}\,\ln(10)}\right)}{\ln(10)}$	18

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(10^(x^(1/2))/x^(1/2),x,method=_RETURNVERBOSE)
[Out] 2*10^(x^(1/2))/ln(10)
```

Maxima [A]
time = 0.30, size = 11, normalized size = 0.52

$$\frac{2\cdot 10^{\left(\sqrt{x}\right)}}{\log\left(10\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(10^(x^(1/2))/x^(1/2),x, algorithm="maxima")
[Out] 2*10^sqrt(x)/log(10)
```

Fricas [A]
time = 0.35, size = 11, normalized size = 0.52

$$\frac{2\cdot 10^{\left(\sqrt{x}\right)}}{\log\left(10\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(10^(x^(1/2))/x^(1/2),x, algorithm="fricas")
[Out] 2*10^sqrt(x)/log(10)
```

Sympy [A]
time = 0.05, size = 10, normalized size = 0.48

$$\frac{2\cdot 10^{\sqrt{x}}}{\log\left(10\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(10**(x**(1/2))/x**(1/2),x)
```

```
[Out] 2*10**(sqrt(x))/log(10)
```

Giac [**A**]
time = 5.04, size = 11, normalized size = 0.52

$$\frac{2 \cdot 10^{\left(\sqrt{x}\right)}}{\log\left(10\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(10^(x^(1/2))/x^(1/2),x, algorithm="giac")
```

```
[Out] 2*10^sqrt(x)/log(10)
```

Mupad [**B**]
time = 3.49, size = 11, normalized size = 0.52

$$\frac{2\,10^{\sqrt{x}}}{\ln\left(10\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(10^(x^(1/2))/x^(1/2),x)
```

```
[Out] (2*10^(x^(1/2)))/log(10)
```

3.744 $\int \left(\frac{1}{\sqrt{e^x+x}}+\frac{e^x}{\sqrt{e^x+x}}\right) dx$

Optimal. Leaf size=11

$$2\sqrt{e^x+x}$$

```
[Out] 2*(x+exp(x))^(1/2)
```

Rubi [A]
time = 0.03, antiderivative size = 11, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 1, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.043$, Rules used = {2293}

$$2\sqrt{x+e^x}$$

Antiderivative was successfully verified.

```
[In] Int[1/Sqrt[E^x + x] + E^x/Sqrt[E^x + x],x]
```

```
[Out] 2*Sqrt[E^x + x]
```

Rule 2293

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_
))) + (a_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Simp[(a*x^n + b*F^(e*(c + d*x))
)^(p + 1)/(b*d*e*(p + 1)*Log[F]), x] - Dist[a*(n/(b*d*e*Log[F])), Int[x^(n
- 1)*(a*x^n + b*F^(e*(c + d*x)))^p, x], x] /; FreeQ[{F, a, b, c, d, e, n, p
}, x] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\int \left(\frac{1}{\sqrt{e^x+x}}+\frac{e^x}{\sqrt{e^x+x}}\right) dx &= \int \frac{1}{\sqrt{e^x+x}}\, dx+\int \frac{e^x}{\sqrt{e^x+x}}\, dx\\ &= 2\sqrt{e^x+x}\end{aligned}$$

Mathematica [A]
time = 0.00, size = 11, normalized size = 1.00

$$2\sqrt{e^x+x}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/Sqrt[E^x + x] + E^x/Sqrt[E^x + x],x]
```

```
[Out] 2*Sqrt[E^x + x]
```

Maple [A]
time = 0.02, size = 9, normalized size = 0.82

method	result	size
risch	$2\sqrt{e^{x}+x}$	9

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(x)+x)^(1/2)+1/(exp(x)+x)^(1/2),x,method=_RETURNVERBOSE)
[Out] 2*(exp(x)+x)^(1/2)
```

Maxima [A]
time = 0.32, size = 8, normalized size = 0.73

$$2\sqrt{x+e^{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(exp(x)+x)^(1/2)+1/(exp(x)+x)^(1/2),x, algorithm="maxima")
[Out] 2*sqrt(x + e^x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(exp(x)+x)^(1/2)+1/(exp(x)+x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{x}+1}{\sqrt{x+e^{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(exp(x)+x)**(1/2)+1/(exp(x)+x)**(1/2),x)
[Out] Integral((exp(x) + 1)/sqrt(x + exp(x)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(exp(x)+x)^(1/2)+1/(exp(x)+x)^(1/2),x, algorithm="giac")
[Out] integrate(e^x/sqrt(x + e^x) + 1/sqrt(x + e^x), x)
```

Mupad [B]
time = 3.45, size = 8, normalized size = 0.73

$$2\sqrt{x+\mathrm{e}^x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x + exp(x))^(1/2) + exp(x)/(x + exp(x))^(1/2),x)
[Out] 2*(x + exp(x))^(1/2)
```

3.745 $\int \left(\frac{(1+e^x)x}{\sqrt{e^x+x}}+2\sqrt{e^x+x}\right)\,dx$

Optimal. Leaf size=12

$$2x\sqrt{e^x+x}$$

[Out] 2*x*(x+exp(x))^(1/2)

Rubi [A]
time = 0.18, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.107$, Rules used = {6874, 2305, 2294}

$$2x\sqrt{x+e^x}$$

Antiderivative was successfully verified.

[In] Int[((1 + E^x)*x)/Sqrt[E^x + x] + 2*Sqrt[E^x + x],x]

[Out] 2*x*Sqrt[E^x + x]

Rule 2294

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*(x_)^(m_.)*((b_.)*(F_)^((e_.)*((c_.)
+ (d_.)*(x_))) + (a_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Simp[x^m*((a*x^n + b
*F^(e*(c + d*x)))^(p + 1)/(b*d*e*(p + 1)*Log[F])), x] + (-Dist[m/(b*d*e*(p
+ 1)*Log[F]), Int[x^(m - 1)*(a*x^n + b*F^(e*(c + d*x)))^(p + 1), x], x] - D
ist[a*(n/(b*d*e*Log[F])), Int[x^(m + n - 1)*(a*x^n + b*F^(e*(c + d*x)))^p,
x], x]) /; FreeQ[{F, a, b, c, d, e, m, n, p}, x] && NeQ[p, -1]
```

Rule 2305

```
Int[(x_)^(m_.)*(E^(x_) + (x_)^(m_.))^(n_), x_Symbol] :> Simp[-(E^x + x^m)^(
n + 1)/(n + 1), x] + (Dist[m, Int[x^(m - 1)*(E^x + x^m)^n, x], x] + Int[(E^
x + x^m)^(n + 1), x]) /; RationalQ[m, n] && GtQ[m, 0] && LtQ[n, 0] && NeQ[n
, -1]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}\int \left(\frac{(1+e^x)\,x}{\sqrt{e^x+x}}+2\sqrt{e^x+x}\right) dx &= 2\int \sqrt{e^x+x}\,dx+\int \frac{(1+e^x)\,x}{\sqrt{e^x+x}}\,dx \\ &= 2\int \sqrt{e^x+x}\,dx+\int \left(\frac{x}{\sqrt{e^x+x}}+\frac{e^x x}{\sqrt{e^x+x}}\right) dx \\ &= 2\int \sqrt{e^x+x}\,dx+\int \frac{x}{\sqrt{e^x+x}}\,dx+\int \frac{e^x x}{\sqrt{e^x+x}}\,dx \\ &= -2\sqrt{e^x+x}+2x\sqrt{e^x+x}+\int \frac{1}{\sqrt{e^x+x}}\,dx-\int \frac{x}{\sqrt{e^x+x}}\,dx+\int \\ &= 2x\sqrt{e^x+x}\end{aligned}$$

Mathematica [A]
time = 0.08, size = 12, normalized size = 1.00

$$2x\sqrt{e^x+x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((1 + E^x)*x)/Sqrt[E^x + x] + 2*Sqrt[E^x + x],x]
```

```
[Out] 2*x*Sqrt[E^x + x]
```

Maple [A]
time = 0.03, size = 10, normalized size = 0.83

method	result	size
risch	$2x\sqrt{e^x+x}$	10

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1+exp(x))*x/(exp(x)+x)^(1/2)+2*(exp(x)+x)^(1/2),x,method=_RETURNVERBOS
E)
```

```
[Out] 2*x*(exp(x)+x)^(1/2)
```

Maxima [A]
time = 0.33, size = 16, normalized size = 1.33

$$\frac{2\,(x^2+xe^x)}{\sqrt{x+e^x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))*x/(exp(x)+x)^(1/2)+2*(exp(x)+x)^(1/2),x, algorithm="ma
xima")
```

```
[Out] 2*(x^2 + x*e^x)/sqrt(x + e^x)
```

Fricas [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))*x/(exp(x)+x)^(1/2)+2*(exp(x)+x)^(1/2),x, algorithm="fr
icas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

Sympy [**F**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{xe^x + 3x + 2e^x}{\sqrt{x + e^x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))*x/(exp(x)+x)**(1/2)+2*(exp(x)+x)**(1/2),x)
```

```
[Out] Integral((x*exp(x) + 3*x + 2*exp(x))/sqrt(x + exp(x)), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))*x/(exp(x)+x)^(1/2)+2*(exp(x)+x)^(1/2),x, algorithm="gi
ac")
```

```
[Out] integrate(x*(e^x + 1)/sqrt(x + e^x) + 2*sqrt(x + e^x), x)
```

Mupad [**B**]
time = 3.63, size = 9, normalized size = 0.75

$$2\,x\,\sqrt{x + \mathrm{e}^x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2*(x + exp(x))^(1/2) + (x*(exp(x) + 1))/(x + exp(x))^(1/2),x)
```

```
[Out] 2*x*(x + exp(x))^(1/2)
```

3.746 $\int \left(\frac{x}{\sqrt{e^x+x}}+\frac{e^x x}{\sqrt{e^x+x}}+2\sqrt{e^x+x}\right) dx$

Optimal. Leaf size=12

$$2x\sqrt{e^x+x}$$

[Out] 2*x*(x+exp(x))^(1/2)

Rubi [A]
time = 0.09, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.054$, Rules used = {2305, 2294}

$$2x\sqrt{x+e^x}$$

Antiderivative was successfully verified.

[In] Int[x/Sqrt[E^x + x] + (E^x*x)/Sqrt[E^x + x] + 2*Sqrt[E^x + x],x]

[Out] 2*x*Sqrt[E^x + x]

Rule 2294

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*(x_)^(m_.)*((b_.)*(F_)^((e_.)*((c_.)
+ (d_.)*(x_))) + (a_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Simp[x^m*((a*x^n + b
*F^(e*(c + d*x)))^(p + 1)/(b*d*e*(p + 1)*Log[F])), x] + (-Dist[m/(b*d*e*(p
+ 1)*Log[F]), Int[x^(m - 1)*(a*x^n + b*F^(e*(c + d*x)))^(p + 1), x], x] - D
ist[a*(n/(b*d*e*Log[F])), Int[x^(m + n - 1)*(a*x^n + b*F^(e*(c + d*x)))^p,
x], x]) /; FreeQ[{F, a, b, c, d, e, m, n, p}, x] && NeQ[p, -1]
```

Rule 2305

```
Int[(x_)^(m_.)*(E^(x_) + (x_)^(m_.))^(n_), x_Symbol] :> Simp[-(E^x + x^m)^(
n + 1)/(n + 1), x] + (Dist[m, Int[x^(m - 1)*(E^x + x^m)^n, x], x] + Int[(E^
x + x^m)^(n + 1), x]) /; RationalQ[m, n] && GtQ[m, 0] && LtQ[n, 0] && NeQ[n
, -1]
```

Rubi steps

$$\begin{aligned}
\int \left(\frac{x}{\sqrt{e^x+x}}+\frac{e^x x}{\sqrt{e^x+x}}+2\sqrt{e^x+x}\right) dx &= 2\int \sqrt{e^x+x}\,dx+\int \frac{x}{\sqrt{e^x+x}}\,dx+\int \frac{e^x x}{\sqrt{e^x+x}}\,dx\\
&= -2\sqrt{e^x+x}+2x\sqrt{e^x+x}+\int \frac{1}{\sqrt{e^x+x}}\,dx-\int \frac{x}{\sqrt{e^x+
\end{aligned}$$

$$= 2x\sqrt{e^x+x}$$

Mathematica [A]
time = 0.02, size = 12, normalized size = 1.00

$$2x\sqrt{e^x + x}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/Sqrt[E^x + x] + (E^x*x)/Sqrt[E^x + x] + 2*Sqrt[E^x + x],x]
```

```
[Out] 2*x*Sqrt[E^x + x]
```

Maple [A]
time = 0.02, size = 10, normalized size = 0.83

method	result	size
risch	$2x\sqrt{e^x + x}$	10

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(exp(x)+x)^(1/2)+exp(x)*x/(exp(x)+x)^(1/2)+2*(exp(x)+x)^(1/2),x,metho
d=_RETURNVERBOSE)
```

```
[Out] 2*x*(exp(x)+x)^(1/2)
```

Maxima [A]
time = 0.32, size = 9, normalized size = 0.75

$$2\sqrt{x + e^x}\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(exp(x)+x)^(1/2)+exp(x)*x/(exp(x)+x)^(1/2)+2*(exp(x)+x)^(1/2),x
, algorithm="maxima")
```

```
[Out] 2*sqrt(x + e^x)*x
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(exp(x)+x)^(1/2)+exp(x)*x/(exp(x)+x)^(1/2)+2*(exp(x)+x)^(1/2),x
, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{xe^x + 3x + 2e^x}{\sqrt{x + e^x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(exp(x)+x)**(1/2)+exp(x)*x/(exp(x)+x)**(1/2)+2*(exp(x)+x)**(1/2
),x)
```

```
[Out] Integral((x*exp(x) + 3*x + 2*exp(x))/sqrt(x + exp(x)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(exp(x)+x)^(1/2)+exp(x)*x/(exp(x)+x)^(1/2)+2*(exp(x)+x)^(1/2),x
, algorithm="giac")
```

```
[Out] integrate(x*e^x/sqrt(x + e^x) + 2*sqrt(x + e^x) + x/sqrt(x + e^x), x)
```

Mupad [B]
time = 3.35, size = 9, normalized size = 0.75

$$2\,x\,\sqrt{x+\mathrm{e}^x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2*(x + exp(x))^(1/2) + x/(x + exp(x))^(1/2) + (x*exp(x))/(x + exp(x))^(
1/2),x)
```

```
[Out] 2*x*(x + exp(x))^(1/2)
```

3.747 $\int \frac{(1+e^x)x}{\sqrt{e^x+x}} \, dx$

Optimal. Leaf size=27

$$2x\sqrt{e^x+x} - 2\text{Int}\left(\sqrt{e^x+x}, x\right)$$

```
[Out] -2*CannotIntegrate((x+exp(x))^(1/2),x)+2*x*(x+exp(x))^(1/2)
```

Rubi [A]
time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{(1+e^x)\,x}{\sqrt{e^x+x}} \, dx$$

Verification is not applicable to the result.

```
[In] Int[((1 + E^x)*x)/Sqrt[E^x + x],x]
[Out] 2*x*Sqrt[E^x + x] - 2*Defer[Int][Sqrt[E^x + x], x]
```

Rubi steps

$$\begin{aligned}
\int \frac{(1+e^x)\,x}{\sqrt{e^x+x}} \, dx &= \int \left(\frac{x}{\sqrt{e^x+x}} + \frac{e^x x}{\sqrt{e^x+x}}\right) dx \\
&= \int \frac{x}{\sqrt{e^x+x}} \, dx + \int \frac{e^x x}{\sqrt{e^x+x}} \, dx \\
&= -2\sqrt{e^x+x} + 2x\sqrt{e^x+x} - 2\int \sqrt{e^x+x} \, dx + \int \frac{1}{\sqrt{e^x+x}} \, dx - \int \frac{x}{\sqrt{e^x+x}} \, dx + \int \\
&= 2x\sqrt{e^x+x} - 2\int \sqrt{e^x+x} \, dx
\end{aligned}$$

Mathematica [A]
time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{(1+e^x)\,x}{\sqrt{e^x+x}} \, dx$$

Verification is not applicable to the result.

```
[In] Integrate[((1 + E^x)*x)/Sqrt[E^x + x],x]
[Out] Integrate[((1 + E^x)*x)/Sqrt[E^x + x], x]
```

Maple [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(1+e^x)\,x}{\sqrt{e^x+x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1+exp(x))*x/(exp(x)+x)^(1/2),x)
```

```
[Out] int((1+exp(x))*x/(exp(x)+x)^(1/2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))*x/(exp(x)+x)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x*(e^x + 1)/sqrt(x + e^x), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))*x/(exp(x)+x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x(e^x+1)}{\sqrt{x+e^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))*x/(exp(x)+x)**(1/2),x)
```

```
[Out] Integral(x*(exp(x) + 1)/sqrt(x + exp(x)), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))*x/(exp(x)+x)^(1/2),x, algorithm="giac")
[Out] integrate(x*(e^x + 1)/sqrt(x + e^x), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\left(e^x+1\right)}{\sqrt{x+e^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(exp(x) + 1))/(x + exp(x))^(1/2),x)
[Out] int((x*(exp(x) + 1))/(x + exp(x))^(1/2), x)
```

3.748 $\int \left(\frac{x}{\sqrt{e^x+x}}+\frac{e^x x}{\sqrt{e^x+x}}\right) dx$

Optimal. Leaf size=27

$$2x\sqrt{e^x+x}-2\mathrm{Int}\left(\sqrt{e^x+x},x\right)$$

```
[Out] -2*CannotIntegrate((x+exp(x))^(1/2),x)+2*x*(x+exp(x))^(1/2)
```

Rubi [A]
time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \left(\frac{x}{\sqrt{e^x+x}}+\frac{e^x x}{\sqrt{e^x+x}}\right) dx$$

Verification is not applicable to the result.

```
[In] Int[x/Sqrt[E^x + x] + (E^x*x)/Sqrt[E^x + x],x]
[Out] 2*x*Sqrt[E^x + x] - 2*Defer[Int][Sqrt[E^x + x], x]
```

Rubi steps

$$\begin{aligned}
\int \left(\frac{x}{\sqrt{e^x+x}}+\frac{e^x x}{\sqrt{e^x+x}}\right) dx &= \int \frac{x}{\sqrt{e^x+x}}\,dx+\int \frac{e^x x}{\sqrt{e^x+x}}\,dx\\
&= -2\sqrt{e^x+x}+2x\sqrt{e^x+x}-2\int \sqrt{e^x+x}\,dx+\int \frac{1}{\sqrt{e^x+x}}\,dx-\int \cdot\\
&= 2x\sqrt{e^x+x}-2\int \sqrt{e^x+x}\,dx
\end{aligned}$$

Mathematica [A]
time = 0.04, size = 0, normalized size = 0.00

$$\int \left(\frac{x}{\sqrt{e^x+x}}+\frac{e^x x}{\sqrt{e^x+x}}\right) dx$$

Verification is not applicable to the result.

```
[In] Integrate[x/Sqrt[E^x + x] + (E^x*x)/Sqrt[E^x + x],x]
[Out] Integrate[x/Sqrt[E^x + x] + (E^x*x)/Sqrt[E^x + x], x]
```

Maple [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt{\mathrm{e}^x+x}}+\frac{\mathrm{e}^x x}{\sqrt{\mathrm{e}^x+x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(exp(x)+x)^(1/2)+exp(x)*x/(exp(x)+x)^(1/2),x)
```

```
[Out] int(x/(exp(x)+x)^(1/2)+exp(x)*x/(exp(x)+x)^(1/2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(exp(x)+x)^(1/2)+exp(x)*x/(exp(x)+x)^(1/2),x, algorithm="maxima
")
```

```
[Out] integrate(x*e^x/sqrt(x + e^x) + x/sqrt(x + e^x), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(exp(x)+x)^(1/2)+exp(x)*x/(exp(x)+x)^(1/2),x, algorithm="fricas
")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x(e^x + 1)}{\sqrt{x + e^x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(exp(x)+x)**(1/2)+exp(x)*x/(exp(x)+x)**(1/2),x)
```

```
[Out] Integral(x*(exp(x) + 1)/sqrt(x + exp(x)), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(exp(x)+x)^(1/2)+exp(x)*x/(exp(x)+x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(x*e^x/sqrt(x + e^x) + x/sqrt(x + e^x), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x}{\sqrt{x + e^x}} + \frac{x\,e^x}{\sqrt{x + e^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(x + exp(x))^(1/2) + (x*exp(x))/(x + exp(x))^(1/2),x)
[Out] int(x/(x + exp(x))^(1/2) + (x*exp(x))/(x + exp(x))^(1/2), x)
```

3.749 $\int \frac{e^x x}{\sqrt{e^x + x}} \, dx$

Optimal. Leaf size=52

$$2\sqrt{e^x+x}+2x\sqrt{e^x+x}-\text{Int}\left(\frac{1}{\sqrt{e^x+x}},x\right)-3\text{Int}\left(\sqrt{e^x+x},x\right)$$

```
[Out] -CannotIntegrate(1/(x+exp(x))^(1/2),x)-3*CannotIntegrate((x+exp(x))^(1/2),x
)+2*(x+exp(x))^(1/2)+2*x*(x+exp(x))^(1/2)
```

Rubi [A]
time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{e^x x}{\sqrt{e^x + x}} \, dx$$

Verification is not applicable to the result.

```
[In] Int[(E^x*x)/Sqrt[E^x + x],x]
```

```
[Out] 2*Sqrt[E^x + x] + 2*x*Sqrt[E^x + x] - Defer[Int][1/Sqrt[E^x + x], x] - 3*De
fer[Int][Sqrt[E^x + x], x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^x x}{\sqrt{e^x+x}} \, dx &= 2x\sqrt{e^x+x}-2\int \sqrt{e^x+x} \, dx-\int \frac{x}{\sqrt{e^x+x}} \, dx\\ &= 2\sqrt{e^x+x}+2x\sqrt{e^x+x}-2\int \sqrt{e^x+x} \, dx-\int \frac{1}{\sqrt{e^x+x}} \, dx-\int \sqrt{e^x+x} \, dx\end{aligned}$$

Mathematica [A]
time = 0.13, size = 0, normalized size = 0.00

$$\int \frac{e^x x}{\sqrt{e^x + x}} \, dx$$

Verification is not applicable to the result.

```
[In] Integrate[(E^x*x)/Sqrt[E^x + x],x]
```

```
[Out] Integrate[(E^x*x)/Sqrt[E^x + x], x]
```

Maple [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{x} x}{\sqrt{e^{x}+x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*x/(exp(x)+x)^(1/2),x)
[Out] int(exp(x)*x/(exp(x)+x)^(1/2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x/(exp(x)+x)^(1/2),x, algorithm="maxima")
[Out] integrate(x*e^x/sqrt(x + e^x), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x/(exp(x)+x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x e^{x}}{\sqrt{x+e^{x}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x/(exp(x)+x)**(1/2),x)
[Out] Integral(x*exp(x)/sqrt(x + exp(x)), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x/(exp(x)+x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(x*e^x/sqrt(x + e^x), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x\,e^x}{\sqrt{x+e^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*exp(x))/(x + exp(x))^(1/2),x)
```

```
[Out] int((x*exp(x))/(x + exp(x))^(1/2), x)
```

3.750 $\int \left(\frac{x^2(5e^x+3x^2)}{5\sqrt{5e^x+x^3}}+\frac{4}{5}x\sqrt{5e^x+x^3}\right)\,dx$

Optimal. Leaf size=20

$$\frac{2}{5}x^2\sqrt{5e^x+x^3}$$

[Out] 2/5*x^2*(5*exp(x)+x^3)^(1/2)

Rubi [A]
time = 0.40, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 50, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.040, Rules used = {6874, 2294}

$$\frac{2}{5}x^2\sqrt{x^3+5e^x}$$

Antiderivative was successfully verified.

[In] Int[(x^2*(5*E^x + 3*x^2))/(5*Sqrt[5*E^x + x^3]) + (4*x*Sqrt[5*E^x + x^3])/5,x]

[Out] (2*x^2*Sqrt[5*E^x + x^3])/5

Rule 2294

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*(x_)^(m_.)*((b_.)*(F_)^((e_.)*((c_.)
+ (d_.)*(x_))) + (a_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Simp[x^m*((a*x^n + b
*F^(e*(c + d*x)))^(p + 1)/(b*d*e*(p + 1)*Log[F])), x] + (-Dist[m/(b*d*e*(p
+ 1)*Log[F]), Int[x^(m - 1)*(a*x^n + b*F^(e*(c + d*x)))^(p + 1), x], x] - D
ist[a*(n/(b*d*e*Log[F])), Int[x^(m + n - 1)*(a*x^n + b*F^(e*(c + d*x)))^p,
x], x]) /; FreeQ[{F, a, b, c, d, e, m, n, p}, x] && NeQ[p, -1]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}\int \left(\frac{x^2(5e^x+3x^2)}{5\sqrt{5e^x+x^3}}+\frac{4}{5}x\sqrt{5e^x+x^3}\right)dx &= \frac{1}{5}\int \frac{x^2(5e^x+3x^2)}{\sqrt{5e^x+x^3}}dx+\frac{4}{5}\int x\sqrt{5e^x+x^3}\,dx\\ &= \frac{1}{5}\int \left(\frac{5e^x x^2}{\sqrt{5e^x+x^3}}+\frac{3x^4}{\sqrt{5e^x+x^3}}\right)dx+\frac{4}{5}\int x\sqrt{5e^x+x^3}\,dx\\ &= \frac{3}{5}\int \frac{x^4}{\sqrt{5e^x+x^3}}dx+\frac{4}{5}\int x\sqrt{5e^x+x^3}\,dx+\int \frac{e^x x^2}{\sqrt{5e^x+x^3}}dx\\ &= \frac{2}{5}x^2\sqrt{5e^x+x^3}\end{aligned}$$

Mathematica [A]
time = 0.21, size = 20, normalized size = 1.00

$$\frac{2}{5}x^2\sqrt{5e^x+x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(5*E^x + 3*x^2))/(5*Sqrt[5*E^x + x^3]) + (4*x*Sqrt[5*E^x + x
^3])/5,x]
```

```
[Out] (2*x^2*Sqrt[5*E^x + x^3])/5
```

Maple [A]
time = 0.03, size = 16, normalized size = 0.80

method	result	size
risch	$\frac{2x^2\sqrt{5\,e^x+x^3}}{5}$	16

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/5*x^2*(5*exp(x)+3*x^2)/(5*exp(x)+x^3)^(1/2)+4/5*x*(5*exp(x)+x^3)^(1/2
),x,method=_RETURNVERBOSE)
```

```
[Out] 2/5*x^2*(5*exp(x)+x^3)^(1/2)
```

Maxima [A]
time = 0.32, size = 23, normalized size = 1.15

$$\frac{2\left(x^5+5\,x^2e^x\right)}{5\,\sqrt{x^3+5\,e^x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/5*x^2*(5*exp(x)+3*x^2)/(5*exp(x)+x^3)^(1/2)+4/5*x*(5*exp(x)+x^3
)^(1/2),x, algorithm="maxima")
```

```
[Out] 2/5*(x^5 + 5*x^2*e^x)/sqrt(x^3 + 5*e^x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/5*x^2*(5*exp(x)+3*x^2)/(5*exp(x)+x^3)^(1/2)+4/5*x*(5*exp(x)+x^3
)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{7x^4}{\sqrt{x^3+5e^x}}\,dx + \int \frac{20xe^x}{\sqrt{x^3+5e^x}}\,dx + \int \frac{5x^2e^x}{\sqrt{x^3+5e^x}}\,dx}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/5*x**2*(5*exp(x)+3*x**2)/(5*exp(x)+x**3)**(1/2)+4/5*x*(5*exp(x)
+x**3)**(1/2),x)
```

```
[Out] (Integral(7*x**4/sqrt(x**3 + 5*exp(x)), x) + Integral(20*x*exp(x)/sqrt(x**3
 + 5*exp(x)), x) + Integral(5*x**2*exp(x)/sqrt(x**3 + 5*exp(x)), x))/5
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/5*x^2*(5*exp(x)+3*x^2)/(5*exp(x)+x^3)^(1/2)+4/5*x*(5*exp(x)+x^3
)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(1/5*(3*x^2 + 5*e^x)*x^2/sqrt(x^3 + 5*e^x) + 4/5*sqrt(x^3 + 5*e^x)
*x, x)
```

Mupad [B]
time = 3.69, size = 15, normalized size = 0.75

$$\frac{2\,x^2\,\sqrt{5\,\mathrm{e}^x+x^3}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((4*x*(5*exp(x) + x^3)^(1/2))/5 + (x^2*(5*exp(x) + 3*x^2))/(5*(5*exp(x)
+ x^3)^(1/2)),x)
```

```
[Out] (2*x^2*(5*exp(x) + x^3)^(1/2))/5
```

3.751 $\int \frac{e^x x^2}{\sqrt{5e^x+x^3}}\,dx$

Optimal. Leaf size=67

$$\frac{2}{5}x^2\sqrt{5e^x+x^3}-\frac{3}{5}\text{Int}\left(\frac{x^4}{\sqrt{5e^x+x^3}},x\right)-\frac{4}{5}\text{Int}\left(x\sqrt{5e^x+x^3},x\right)$$

```
[Out] -3/5*CannotIntegrate(x^4/(5*exp(x)+x^3)^(1/2),x)-4/5*CannotIntegrate(x*(5*e
xp(x)+x^3)^(1/2),x)+2/5*x^2*(5*exp(x)+x^3)^(1/2)
```

Rubi [A]
time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{e^x x^2}{\sqrt{5e^x+x^3}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[(E^x*x^2)/Sqrt[5*E^x + x^3],x]
[Out] (2*x^2*Sqrt[5*E^x + x^3])/5 - (3*Defer[Int][x^4/Sqrt[5*E^x + x^3], x])/5 -
(4*Defer[Int][x*Sqrt[5*E^x + x^3], x])/5
```

Rubi steps

$$\int \frac{e^x x^2}{\sqrt{5e^x+x^3}}\,dx=\frac{2}{5}x^2\sqrt{5e^x+x^3}-\frac{3}{5}\int \frac{x^4}{\sqrt{5e^x+x^3}}\,dx-\frac{4}{5}\int x\sqrt{5e^x+x^3}\,dx$$

Mathematica [A]
time = 0.36, size = 0, normalized size = 0.00

$$\int \frac{e^x x^2}{\sqrt{5e^x+x^3}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[(E^x*x^2)/Sqrt[5*E^x + x^3],x]
[Out] Integrate[(E^x*x^2)/Sqrt[5*E^x + x^3], x]
```

Maple [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{x} x^2}{\sqrt{5\,e^{x}+x^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*x^2/(5*exp(x)+x^3)^(1/2),x)
```

```
[Out] int(exp(x)*x^2/(5*exp(x)+x^3)^(1/2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x^2/(5*exp(x)+x^3)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^2*e^x/sqrt(x^3 + 5*e^x), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x^2/(5*exp(x)+x^3)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2 e^x}{\sqrt{x^3 + 5e^x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x**2/(5*exp(x)+x**3)**(1/2),x)
```

```
[Out] Integral(x**2*exp(x)/sqrt(x**3 + 5*exp(x)), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x^2/(5*exp(x)+x^3)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(x^2*e^x/sqrt(x^3 + 5*e^x), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2 e^x}{\sqrt{5 e^x + x^3}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*exp(x))/(5*exp(x) + x^3)^(1/2),x)
[Out] int((x^2*exp(x))/(5*exp(x) + x^3)^(1/2), x)
```

3.752 $\int -\frac{1+e^x}{\sqrt[3]{e^x+x}}\,dx$

Optimal. Leaf size=13

$$-\frac{3}{2}(e^x+x)^{2/3}$$

```
[Out] -3/2*(x+exp(x))^(2/3)
```

Rubi [A]
time = 0.02, antiderivative size = 13, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.062$, Rules used = {6818}

$$-\frac{3}{2}(x+e^x)^{2/3}$$

Antiderivative was successfully verified.

```
[In] Int[-((1 + E^x)/(E^x + x)^(1/3)),x]
```

```
[Out] (-3*(E^x + x)^(2/3))/2
```

Rule 6818

```
Int[(u_)*(y_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Si
mp[q*(y^(m + 1)/(m + 1)), x] /;  !FalseQ[q]] /; FreeQ[m, x] && NeQ[m, -1]
```

Rubi steps

$$\int -\frac{1+e^x}{\sqrt[3]{e^x+x}}\,dx = -\frac{3}{2}(e^x+x)^{2/3}$$

Mathematica [A]
time = 0.02, size = 13, normalized size = 1.00

$$-\frac{3}{2}(e^x+x)^{2/3}$$

Antiderivative was successfully verified.

```
[In] Integrate[-((1 + E^x)/(E^x + x)^(1/3)),x]
```

```
[Out] (-3*(E^x + x)^(2/3))/2
```

Maple [A]
time = 0.01, size = 9, normalized size = 0.69

method	result	size
risch	$-\frac{3(e^x+x)^{\frac{2}{3}}}{2}$	9

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-1-exp(x))/(exp(x)+x)^(1/3),x,method=_RETURNVERBOSE)
```

```
[Out] -3/2*(exp(x)+x)^(2/3)
```

Maxima [A]
time = 0.34, size = 8, normalized size = 0.62

$$-\frac{3}{2}\,(x+e^x)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-1-exp(x))/(exp(x)+x)^(1/3),x, algorithm="maxima")
```

```
[Out] -3/2*(x + e^x)^(2/3)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-1-exp(x))/(exp(x)+x)^(1/3),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

Sympy [A]
time = 0.07, size = 12, normalized size = 0.92

$$-\frac{3(x+e^x)^{\frac{2}{3}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-1-exp(x))/(exp(x)+x)**(1/3),x)
```

```
[Out] -3*(x + exp(x))**(2/3)/2
```

Giac [A]
time = 5.40, size = 8, normalized size = 0.62

$$-\frac{3}{2}\,(x+e^x)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-1-exp(x))/(exp(x)+x)^(1/3),x, algorithm="giac")
```

```
[Out] -3/2*(x + e^x)^(2/3)
```

Mupad [B]
time = 3.37, size = 8, normalized size = 0.62

$$-\frac{3\left(x+e^x\right)^{2/3}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(exp(x) + 1)/(x + exp(x))^(1/3),x)
```

```
[Out] -(3*(x + exp(x))^(2/3))/2
```

3.753 $\int \left(-\frac{1}{\sqrt[3]{e^x+x}}+\frac{x}{\sqrt[3]{e^x+x}}-(e^x+x)^{2/3}\right)\,dx$

Optimal. Leaf size=13

$$-\frac{3}{2}(e^x+x)^{2/3}$$

```
[Out] -3/2*(x+exp(x))^(2/3)
```

Rubi [A]
time = 0.05, antiderivative size = 13, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 1, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}} = 0.029$, Rules used = {2305}

$$-\frac{3}{2}(x+e^x)^{2/3}$$

Antiderivative was successfully verified.

```
[In] Int[-(E^x + x)^(-1/3) + x/(E^x + x)^(1/3) - (E^x + x)^(2/3),x]
```

```
[Out] (-3*(E^x + x)^(2/3))/2
```

Rule 2305

```
Int[(x_)^(m_.)*(E^(x_) + (x_)^(m_.))^(n_), x_Symbol] :> Simp[-(E^x + x^m)^(
n + 1)/(n + 1), x] + (Dist[m, Int[x^(m - 1)*(E^x + x^m)^n, x], x] + Int[(E^
x + x^m)^(n + 1), x]) /; RationalQ[m, n] && GtQ[m, 0] && LtQ[n, 0] && NeQ[n
, -1]
```

Rubi steps

$$\begin{aligned}\int \left(-\frac{1}{\sqrt[3]{e^x+x}}+\frac{x}{\sqrt[3]{e^x+x}}-(e^x+x)^{2/3}\right)\,dx &= -\int \frac{1}{\sqrt[3]{e^x+x}}\,dx+\int \frac{x}{\sqrt[3]{e^x+x}}\,dx-\int (e^x+x)^{2/3}\,dx\\ &= -\frac{3}{2}(e^x+x)^{2/3}\end{aligned}$$

Mathematica [A]
time = 0.00, size = 13, normalized size = 1.00

$$-\frac{3}{2}(e^x+x)^{2/3}$$

Antiderivative was successfully verified.

```
[In] Integrate[-(E^x + x)^(-1/3) + x/(E^x + x)^(1/3) - (E^x + x)^(2/3),x]
```

```
[Out] (-3*(E^x + x)^(2/3))/2
```

Maple [A]
time = 0.02, size = 9, normalized size = 0.69

method	result	size
risch	$-\frac{3(e^{x}+x)^{\frac{2}{3}}}{2}$	9

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-1/(exp(x)+x)^(1/3)+x/(exp(x)+x)^(1/3)-(exp(x)+x)^(2/3),x,method=_RETUR
NVERBOSE)
```

```
[Out] -3/2*(exp(x)+x)^(2/3)
```

Maxima [A]
time = 0.34, size = 8, normalized size = 0.62

$$-\frac{3}{2}\,(x+e^{x})^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(-1/(exp(x)+x)^(1/3)+x/(exp(x)+x)^(1/3)-(exp(x)+x)^(2/3),x, algori
thm="maxima")
```

```
[Out] -3/2*(x + e^x)^(2/3)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(-1/(exp(x)+x)^(1/3)+x/(exp(x)+x)^(1/3)-(exp(x)+x)^(2/3),x, algori
thm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$-\int\frac{e^{x}}{\sqrt[3]{x+e^{x}}}\,dx-\int\frac{1}{\sqrt[3]{x+e^{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(-1/(exp(x)+x)**(1/3)+x/(exp(x)+x)**(1/3)-(exp(x)+x)**(2/3),x)
```

```
[Out] -Integral(exp(x)/(x + exp(x))**(1/3), x) - Integral((x + exp(x))**(-1/3), x
)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(-1/(exp(x)+x)^(1/3)+x/(exp(x)+x)^(1/3)-(exp(x)+x)^(2/3),x, algori
thm="giac")
```

```
[Out] integrate(-(x + e^x)^(2/3) + x/(x + e^x)^(1/3) - 1/(x + e^x)^(1/3), x)
```

Mupad [B]
time = 3.38, size = 8, normalized size = 0.62

$$-\frac{3\,{\left(x+\mathrm{e}^x\right)}^{2/3}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(x + exp(x))^(1/3) - (x + exp(x))^(2/3) - 1/(x + exp(x))^(1/3),x)
```

```
[Out] -(3*(x + exp(x))^(2/3))/2
```

3.754 $\int \frac{x}{\sqrt[3]{e^x+x}}\,dx$

Optimal. Leaf size=38

$$-\frac{3}{2}(e^x+x)^{2/3}+\text{Int}\left(\frac{1}{\sqrt[3]{e^x+x}},x\right)+\text{Int}\left((e^x+x)^{2/3},x\right)$$

```
[Out] -3/2*(x+exp(x))^(2/3)+CannotIntegrate(1/(x+exp(x))^(1/3),x)+CannotIntegrate
((x+exp(x))^(2/3),x)
```

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}=0.000$, Rules used = {}

$$\int \frac{x}{\sqrt[3]{e^x+x}}\,dx$$

Verification is not applicable to the result.

```
[In] Int[x/(E^x + x)^(1/3),x]
[Out] (-3*(E^x + x)^(2/3))/2 + Defer[Int][(E^x + x)^(-1/3), x] + Defer[Int][(E^x
+ x)^(2/3), x]
```

Rubi steps

$$\int \frac{x}{\sqrt[3]{e^x+x}}\,dx=-\frac{3}{2}(e^x+x)^{2/3}+\int \frac{1}{\sqrt[3]{e^x+x}}\,dx+\int (e^x+x)^{2/3}\,dx$$

Mathematica [A]
time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt[3]{e^x+x}}\,dx$$

Verification is not applicable to the result.

```
[In] Integrate[x/(E^x + x)^(1/3),x]
[Out] Integrate[x/(E^x + x)^(1/3), x]
```

Maple [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(e^x+x\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(exp(x)+x)^(1/3),x)
```

```
[Out] int(x/(exp(x)+x)^(1/3),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(exp(x)+x)^(1/3),x, algorithm="maxima")
```

```
[Out] integrate(x/(x + e^x)^(1/3), x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(exp(x)+x)^(1/3),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt[3]{x + e^{x}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(exp(x)+x)**(1/3),x)
```

```
[Out] Integral(x/(x + exp(x))**(1/3), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(exp(x)+x)^(1/3),x, algorithm="giac")
```

```
[Out] integrate(x/(x + e^x)^(1/3), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x}{(x + e^x)^{1/3}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(x + exp(x))^(1/3),x)
```

```
[Out] int(x/(x + exp(x))^(1/3), x)
```

3.755 $\int \frac{5x+e^x(3+2x)}{\sqrt[3]{e^x+x}} \, dx$

Optimal. Leaf size=12

$$3x(e^x+x)^{2/3}$$

[Out] 3*x*(x+exp(x))^(2/3)

Rubi [A]
time = 0.23, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$, Rules used = {6874, 2305, 2293, 2294}

$$3x(x+e^x)^{2/3}$$

Antiderivative was successfully verified.

[In] Int[(5*x + E^x*(3 + 2*x))/(E^x + x)^(1/3),x]

[Out] 3*x*(E^x + x)^(2/3)

Rule 2293

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_
))) + (a_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Simp[(a*x^n + b*F^(e*(c + d*x))
)^(p + 1)/(b*d*e*(p + 1)*Log[F]), x] - Dist[a*(n/(b*d*e*Log[F])), Int[x^(n
- 1)*(a*x^n + b*F^(e*(c + d*x)))^p, x], x] /; FreeQ[{F, a, b, c, d, e, n, p
}, x] && NeQ[p, -1]
```

Rule 2294

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*(x_)^(m_.)*((b_.)*(F_)^((e_.)*((c_.)
+ (d_.)*(x_))) + (a_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Simp[x^m*((a*x^n + b
*F^(e*(c + d*x)))^(p + 1)/(b*d*e*(p + 1)*Log[F])), x] + (-Dist[m/(b*d*e*(p
+ 1)*Log[F]), Int[x^(m - 1)*(a*x^n + b*F^(e*(c + d*x)))^(p + 1), x], x] - D
ist[a*(n/(b*d*e*Log[F])), Int[x^(m + n - 1)*(a*x^n + b*F^(e*(c + d*x)))^p,
x], x]) /; FreeQ[{F, a, b, c, d, e, m, n, p}, x] && NeQ[p, -1]
```

Rule 2305

```
Int[(x_)^(m_.)*(E^(x_) + (x_)^(m_.))^(n_), x_Symbol] :> Simp[-(E^x + x^m)^(
n + 1)/(n + 1), x] + (Dist[m, Int[x^(m - 1)*(E^x + x^m)^n, x], x] + Int[(E^
x + x^m)^(n + 1), x]) /; RationalQ[m, n] && GtQ[m, 0] && LtQ[n, 0] && NeQ[n
, -1]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$
\begin{aligned}
\int \frac{5x+e^x(3+2x)}{\sqrt[3]{e^x+x}}\,dx &= \int \left(\frac{5x}{\sqrt[3]{e^x+x}}+\frac{e^x(3+2x)}{\sqrt[3]{e^x+x}}\right)dx\\
&= 5\int \frac{x}{\sqrt[3]{e^x+x}}\,dx+\int \frac{e^x(3+2x)}{\sqrt[3]{e^x+x}}\,dx\\
&= -\frac{15}{2}(e^x+x)^{2/3}+5\int \frac{1}{\sqrt[3]{e^x+x}}\,dx+5\int (e^x+x)^{2/3}\,dx+\int \left(\frac{3e^x}{\sqrt[3]{e^x+x}}+\frac{2e
\end{aligned}
$$

$$
\begin{aligned}
&= -\frac{15}{2}(e^x+x)^{2/3}+2\int \frac{e^x x}{\sqrt[3]{e^x+x}}\,dx+3\int \frac{e^x}{\sqrt[3]{e^x+x}}\,dx+5\int \frac{1}{\sqrt[3]{e^x+x}}\,dx+5\int\\
&= -3(e^x+x)^{2/3}+3x(e^x+x)^{2/3}-2\int \frac{x}{\sqrt[3]{e^x+x}}\,dx-3\int \frac{1}{\sqrt[3]{e^x+x}}\,dx-3\int (e^x\\
&= 3x(e^x+x)^{2/3}-2\int \frac{1}{\sqrt[3]{e^x+x}}\,dx-2\int (e^x+x)^{2/3}\,dx-3\int \frac{1}{\sqrt[3]{e^x+x}}\,dx-3\int
\end{aligned}
$$

Mathematica [A]
time = 0.08, size = 12, normalized size = 1.00

$$3x(e^x+x)^{2/3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(5*x + E^x*(3 + 2*x))/(E^x + x)^(1/3),x]
[Out] 3*x*(E^x + x)^(2/3)
```

Maple [A]
time = 0.01, size = 10, normalized size = 0.83

method	result	size
risch	$3x(\mathrm{e}^x+x)^{\frac{2}{3}}$	10

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((5*x+exp(x)*(3+2*x))/(exp(x)+x)^(1/3),x,method=_RETURNVERBOSE)
[Out] 3*x*(exp(x)+x)^(2/3)
```

Maxima [A]
time = 0.32, size = 16, normalized size = 1.33

$$\frac{3\,(x^2+xe^x)}{(x+e^x)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x+exp(x)*(3+2*x))/(exp(x)+x)^(1/3),x, algorithm="maxima")
```

```
[Out] 3*(x^2 + x*e^x)/(x + e^x)^(1/3)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x+exp(x)*(3+2*x))/(exp(x)+x)^(1/3),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2xe^x + 5x + 3e^x}{\sqrt[3]{x + e^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x+exp(x)*(3+2*x))/(exp(x)+x)**(1/3),x)
```

```
[Out] Integral((2*x*exp(x) + 5*x + 3*exp(x))/(x + exp(x))**(1/3), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x+exp(x)*(3+2*x))/(exp(x)+x)^(1/3),x, algorithm="giac")
```

```
[Out] integrate(((2*x + 3)*e^x + 5*x)/(x + e^x)^(1/3), x)
```

Mupad [B]
time = 3.47, size = 9, normalized size = 0.75

$$3\,x\,{\left(x+\mathrm{e}^x\right)}^{2/3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((5*x + exp(x)*(2*x + 3))/(x + exp(x))^(1/3),x)
```

```
[Out] 3*x*(x + exp(x))^(2/3)
```

3.756 $\int \left(\frac{2x}{\sqrt[3]{e^x+x}}+\frac{2e^x x}{\sqrt[3]{e^x+x}}+3(e^x+x)^{2/3}\right) dx$

Optimal. Leaf size=12

$$3x(e^x+x)^{2/3}$$

```
[Out] 3*x*(x+exp(x))^(2/3)
```

Rubi [A]
time = 0.09, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 39, $\frac{\text{number of rules}}{\text{integrand size}} = 0.051$, Rules used = {2305, 2294}

$$3x(x+e^x)^{2/3}$$

Antiderivative was successfully verified.

```
[In] Int[(2*x)/(E^x + x)^(1/3) + (2*E^x*x)/(E^x + x)^(1/3) + 3*(E^x + x)^(2/3),x
]
```

```
[Out] 3*x*(E^x + x)^(2/3)
```

Rule 2294

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*(x_)^(m_.)*((b_.)*(F_)^((e_.)*((c_.)
+ (d_.)*(x_))) + (a_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Simp[x^m*((a*x^n + b
*F^(e*(c + d*x)))^(p + 1)/(b*d*e*(p + 1)*Log[F])), x] + (-Dist[m/(b*d*e*(p
+ 1)*Log[F]), Int[x^(m - 1)*(a*x^n + b*F^(e*(c + d*x)))^(p + 1), x], x] - D
ist[a*(n/(b*d*e*Log[F])), Int[x^(m + n - 1)*(a*x^n + b*F^(e*(c + d*x)))^p,
x], x]) /; FreeQ[{F, a, b, c, d, e, m, n, p}, x] && NeQ[p, -1]
```

Rule 2305

```
Int[(x_)^(m_.)*(E^(x_) + (x_)^(m_.))^(n_), x_Symbol] :> Simp[-(E^x + x^m)^(
n + 1)/(n + 1), x] + (Dist[m, Int[x^(m - 1)*(E^x + x^m)^n, x], x] + Int[(E^
x + x^m)^(n + 1), x]) /; RationalQ[m, n] && GtQ[m, 0] && LtQ[n, 0] && NeQ[n
, -1]
```

Rubi steps

$$\begin{aligned} \int \left(\frac{2x}{\sqrt[3]{e^x+x}}+\frac{2e^x x}{\sqrt[3]{e^x+x}}+3(e^x+x)^{2/3}\right) dx &= 2\int \frac{x}{\sqrt[3]{e^x+x}}\,dx+2\int \frac{e^x x}{\sqrt[3]{e^x+x}}\,dx+3\int (e^x+x)^{2/3}\,d \\ &= -3(e^x+x)^{2/3}+3x(e^x+x)^{2/3}+2\int \frac{1}{\sqrt[3]{e^x+x}}\,dx-2\int \\ &= 3x(e^x+x)^{2/3} \end{aligned}$$

Mathematica [A]
time = 0.02, size = 12, normalized size = 1.00

$$3x(e^x + x)^{2/3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(2*x)/(E^x + x)^(1/3) + (2*E^x*x)/(E^x + x)^(1/3) + 3*(E^x + x)^(
2/3),x]
```

```
[Out] 3*x*(E^x + x)^(2/3)
```

Maple [A]
time = 0.02, size = 10, normalized size = 0.83

method	result	size
risch	$3x(e^x + x)^{\frac{2}{3}}$	10

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2*x/(exp(x)+x)^(1/3)+2*exp(x)*x/(exp(x)+x)^(1/3)+3*(exp(x)+x)^(2/3),x,m
ethod=_RETURNVERBOSE)
```

```
[Out] 3*x*(exp(x)+x)^(2/3)
```

Maxima [A]
time = 0.32, size = 16, normalized size = 1.33

$$\frac{3\,(x^2 + xe^x)}{(x + e^x)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2*x/(exp(x)+x)^(1/3)+2*exp(x)*x/(exp(x)+x)^(1/3)+3*(exp(x)+x)^(2/
3),x, algorithm="maxima")
```

```
[Out] 3*(x^2 + x*e^x)/(x + e^x)^(1/3)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2*x/(exp(x)+x)^(1/3)+2*exp(x)*x/(exp(x)+x)^(1/3)+3*(exp(x)+x)^(2/
3),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2xe^x + 5x + 3e^x}{\sqrt[3]{x + e^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2*x/(exp(x)+x)**(1/3)+2*exp(x)*x/(exp(x)+x)**(1/3)+3*(exp(x)+x)**
(2/3),x)
```

```
[Out] Integral((2*x*exp(x) + 5*x + 3*exp(x))/(x + exp(x))**(1/3), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2*x/(exp(x)+x)^(1/3)+2*exp(x)*x/(exp(x)+x)^(1/3)+3*(exp(x)+x)^(2/
3),x, algorithm="giac")
```

```
[Out] integrate(2*x*e^x/(x + e^x)^(1/3) + 3*(x + e^x)^(2/3) + 2*x/(x + e^x)^(1/3)
, x)
```

Mupad [B]
time = 3.64, size = 9, normalized size = 0.75

$$3\,x\,{\left(x+\mathrm{e}^x\right)}^{2/3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(3*(x + exp(x))^(2/3) + (2*x)/(x + exp(x))^(1/3) + (2*x*exp(x))/(x + exp
(x))^(1/3),x)
```

```
[Out] 3*x*(x + exp(x))^(2/3)
```

3.757 $\int e^x(-e^{-x}+e^x)\left(e^{-x}+e^x\right)^2\,dx$

Optimal. Leaf size=31

$$\frac{e^{-2x}}{2}+\frac{e^{2x}}{2}+\frac{e^{4x}}{4}-x$$

```
[Out] 1/2/exp(2*x)+1/2*exp(2*x)+1/4*exp(4*x)-x
```

Rubi [A]
time = 0.03, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2320, 14}

$$-x+\frac{e^{-2x}}{2}+\frac{e^{2x}}{2}+\frac{e^{4x}}{4}$$

Antiderivative was successfully verified.

```
[In] Int[E^x*(-E^(-x) + E^x)*(E^(-x) + E^x)^2,x]
```

```
[Out] 1/(2*E^(2*x)) + E^(2*x)/2 + E^(4*x)/4 - x
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2320

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int e^x\left(-e^{-x}+e^x\right)\left(e^{-x}+e^x\right)^2\,dx &= \text{Subst}\left(\int\frac{-1-\frac{1}{x^2}+x^2+x^4}{x}\,dx,x,e^x\right)\\ &= \text{Subst}\left(\int\left(-\frac{1}{x^3}-\frac{1}{x}+x+x^3\right)dx,x,e^x\right)\\ &= \frac{e^{-2x}}{2}+\frac{e^{2x}}{2}+\frac{e^{4x}}{4}-x\end{aligned}$$

Mathematica [A]
time = 0.02, size = 31, normalized size = 1.00

$$\frac{e^{-2x}}{2}+\frac{e^{2x}}{2}+\frac{e^{4x}}{4}-x$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*(-E^(-x) + E^x)*(E^(-x) + E^x)^2,x]
```

```
[Out] 1/(2*E^(2*x)) + E^(2*x)/2 + E^(4*x)/4 - x
```

Maple [A]
time = 0.02, size = 23, normalized size = 0.74

method	result	size
default	$-x+\frac{e^{2x}}{2}+\frac{e^{4x}}{4}+\frac{e^{-2x}}{2}$	23
risch	$-x+\frac{e^{2x}}{2}+\frac{e^{4x}}{4}+\frac{e^{-2x}}{2}$	23
norman	$\left(\frac{e^{5x}}{2}+\frac{e^{7x}}{4}-e^{3x}x+\frac{e^{x}}{2}\right)e^{-3x}$	30

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(-1/exp(x)+exp(x))*(exp(-x)+exp(x))^2,x,method=_RETURNVERBOSE)
```

```
[Out] -x+1/2*exp(x)^2+1/4*exp(x)^4+1/2/exp(x)^2
```

Maxima [A]
time = 0.29, size = 24, normalized size = 0.77

$$\frac{1}{4}\left(2e^{(-2x)}+1\right)e^{(4x)}-x+\frac{1}{2}e^{(-2x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-1/exp(x)+exp(x))*(exp(-x)+exp(x))^2,x, algorithm="maxima
")
```

```
[Out] 1/4*(2*e^(-2*x) + 1)*e^(4*x) - x + 1/2*e^(-2*x)
```

Fricas [A]
time = 0.35, size = 27, normalized size = 0.87

$$-\frac{1}{4}\left(4xe^{(2x)}-e^{(6x)}-2e^{(4x)}-2\right)e^{(-2x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-1/exp(x)+exp(x))*(exp(-x)+exp(x))^2,x, algorithm="fricas
")
```

```
[Out] -1/4*(4*x*e^(2*x) - e^(6*x) - 2*e^(4*x) - 2)*e^(-2*x)
```

Sympy [A]
time = 0.04, size = 22, normalized size = 0.71

$$-x+\frac{e^{4x}}{4}+\frac{e^{2x}}{2}+\frac{e^{-2x}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-1/exp(x)+exp(x))*(exp(-x)+exp(x))**2,x)
[Out] -x + exp(4*x)/4 + exp(2*x)/2 + exp(-2*x)/2
```

Giac [A]
time = 5.04, size = 28, normalized size = 0.90

$$\frac{1}{2}\left(e^{(2x)}+1\right)e^{(-2x)}-x+\frac{1}{4}e^{(4x)}+\frac{1}{2}e^{(2x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-1/exp(x)+exp(x))*(exp(-x)+exp(x))^2,x, algorithm="giac")
[Out] 1/2*(e^(2*x) + 1)*e^(-2*x) - x + 1/4*e^(4*x) + 1/2*e^(2*x)
```

Mupad [B]
time = 3.39, size = 22, normalized size = 0.71

$$\frac{e^{-2x}}{2}-x+\frac{e^{2x}}{2}+\frac{e^{4x}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-exp(x)*(exp(-x) + exp(x))^2*(exp(-x) - exp(x)),x)
[Out] exp(-2*x)/2 - x + exp(2*x)/2 + exp(4*x)/4
```

3.758 $\int \frac{x}{e^x+x}\,dx$

Optimal. Leaf size=12

$$\text{Int}\left(\frac{x}{e^x+x},x\right)$$

[Out] CannotIntegrate(x/(x+exp(x)),x)

Rubi [A]
time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x}{e^x+x}\,dx$$

Verification is not applicable to the result.

[In] Int[x/(E^x + x),x]

[Out] Defer[Int][x/(E^x + x), x]

Rubi steps

$$\int \frac{x}{e^x+x}\,dx = \int \frac{x}{e^x+x}\,dx$$

Mathematica [A]
time = 3.77, size = 0, normalized size = 0.00

$$\int \frac{x}{e^x+x}\,dx$$

Verification is not applicable to the result.

[In] Integrate[x/(E^x + x),x]

[Out] Integrate[x/(E^x + x), x]

Maple [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{e^x+x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(exp(x)+x),x)
```

```
[Out] int(x/(exp(x)+x),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(exp(x)+x),x, algorithm="maxima")
```

```
[Out] integrate(x/(x + e^x), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(exp(x)+x),x, algorithm="fricas")
```

```
[Out] integral(x/(x + e^x), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{x + e^{x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(exp(x)+x),x)
```

```
[Out] Integral(x/(x + exp(x)), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(exp(x)+x),x, algorithm="giac")
```

```
[Out] integrate(x/(x + e^x), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.08

$$\int \frac{x}{x + \mathrm{e}^{x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(x + exp(x)),x)
[Out] int(x/(x + exp(x)), x)
```

3.759 $\int \frac{x^2}{\sqrt{e^x + x}} \, dx$

Optimal. Leaf size=16

$$\text{Int}\left(\frac{x^2}{\sqrt{e^x + x}}, x\right)$$

```
[Out] CannotIntegrate(x^2/(x+exp(x))^(1/2),x)
```

Rubi [A]
time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{x^2}{\sqrt{e^x + x}} \, dx$$

Verification is not applicable to the result.

```
[In] Int[x^2/Sqrt[E^x + x],x]
[Out] Defer[Int][x^2/Sqrt[E^x + x], x]
```

Rubi steps

$$\int \frac{x^2}{\sqrt{e^x + x}} \, dx = \int \frac{x^2}{\sqrt{e^x + x}} \, dx$$

Mathematica [A]
time = 0.06, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\sqrt{e^x + x}} \, dx$$

Verification is not applicable to the result.

```
[In] Integrate[x^2/Sqrt[E^x + x],x]
[Out] Integrate[x^2/Sqrt[E^x + x], x]
```

Maple [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\sqrt{\mathrm{e}^x + x}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(exp(x)+x)^(1/2),x)
```

```
[Out] int(x^2/(exp(x)+x)^(1/2),x)
```

Maxima [**A**]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(exp(x)+x)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^2/sqrt(x + e^x), x)
```

Fricas [**F(-2)**]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(exp(x)+x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

Sympy [**A**]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\sqrt{x + e^x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(exp(x)+x)**(1/2),x)
```

```
[Out] Integral(x**2/sqrt(x + exp(x)), x)
```

Giac [**A**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(exp(x)+x)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(x^2/sqrt(x + e^x), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{x^2}{\sqrt{x+e^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(x + exp(x))^(1/2),x)
[Out] int(x^2/(x + exp(x))^(1/2), x)
```

3.760 $\int \frac{e^x}{e^x+x} dx$

Optimal. Leaf size=14

$$\text{Int}\left(\frac{e^x}{e^x+x},x\right)$$

```
[Out] CannotIntegrate(exp(x)/(x+exp(x)),x)
```

Rubi [A]
time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{e^x}{e^x+x} dx$$

Verification is not applicable to the result.

```
[In] Int[E^x/(E^x + x),x]
```

```
[Out] Defer[Int][E^x/(E^x + x), x]
```

Rubi steps

$$\int \frac{e^x}{e^x+x} dx = \int \frac{e^x}{e^x+x} dx$$

Mathematica [A]
time = 0.01, size = 0, normalized size = 0.00

$$\int \frac{e^x}{e^x+x} dx$$

Verification is not applicable to the result.

```
[In] Integrate[E^x/(E^x + x),x]
```

```
[Out] Integrate[E^x/(E^x + x), x]
```

Maple [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{e}^x}{\mathrm{e}^x+x} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(x)+x),x)
```

```
[Out] int(exp(x)/(exp(x)+x),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(exp(x)+x),x, algorithm="maxima")
```

```
[Out] x - integrate(x/(x + e^x), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(exp(x)+x),x, algorithm="fricas")
```

```
[Out] integral(e^x/(x + e^x), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^x}{x + e^x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(exp(x)+x),x)
```

```
[Out] Integral(exp(x)/(x + exp(x)), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(exp(x)+x),x, algorithm="giac")
```

```
[Out] integrate(e^x/(x + e^x), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.07

$$\int \frac{\mathrm{e}^x}{x + \mathrm{e}^x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(x + exp(x)),x)
```

```
[Out] int(exp(x)/(x + exp(x)), x)
```

3.761 $\int \frac{e^x}{e^x+x^2} dx$

Optimal. Leaf size=16

$$\text{Int}\left(\frac{e^x}{e^x+x^2},x\right)$$

[Out] CannotIntegrate(exp(x)/(exp(x)+x^2),x)

Rubi [A]
time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{e^x}{e^x+x^2} dx$$

Verification is not applicable to the result.

[In] Int[E^x/(E^x + x^2),x]

[Out] Defer[Int][E^x/(E^x + x^2), x]

Rubi steps

$$\int \frac{e^x}{e^x+x^2} dx = \int \frac{e^x}{e^x+x^2} dx$$

Mathematica [A]
time = 0.06, size = 0, normalized size = 0.00

$$\int \frac{e^x}{e^x+x^2} dx$$

Verification is not applicable to the result.

[In] Integrate[E^x/(E^x + x^2),x]

[Out] Integrate[E^x/(E^x + x^2), x]

Maple [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^x}{e^x+x^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(x)+x^2),x)
[Out] int(exp(x)/(exp(x)+x^2),x)
```

Maxima [A]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(exp(x)+x^2),x, algorithm="maxima")
[Out] x - integrate(x^2/(x^2 + e^x), x)
```

Fricas [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(exp(x)+x^2),x, algorithm="fricas")
[Out] integral(e^x/(x^2 + e^x), x)
```

Sympy [A]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^x}{x^2 + e^x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(exp(x)+x**2),x)
[Out] Integral(exp(x)/(x**2 + exp(x)), x)
```

Giac [A]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(exp(x)+x^2),x, algorithm="giac")
[Out] integrate(e^x/(x^2 + e^x), x)
```

Mupad [A]
time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{\mathrm{e}^x}{\mathrm{e}^x + x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(x) + x^2),x)
[Out] int(exp(x)/(exp(x) + x^2), x)
```

3.762 $\int \left(aF^{c+dx}\right)^m \left(bF^{e+fx}\right)^n \, dx$

Optimal. Leaf size=36

$$\frac{\left(aF^{c+dx}\right)^m \left(bF^{e+fx}\right)^n}{(dm+fn)\log(F)}$$

```
[Out] (a*F^(d*x+c))^m*(b*F^(f*x+e))^n/(d*m+f*n)/ln(F)
```

Rubi [A]
time = 0.07, antiderivative size = 36, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.130$, Rules used = {2319, 2259, 2225}

$$\frac{\left(aF^{c+dx}\right)^m \left(bF^{e+fx}\right)^n}{\log(F)(dm+fn)}$$

Antiderivative was successfully verified.

```
[In] Int[(a*F^(c + d*x))^m*(b*F^(e + f*x))^n,x]
```

```
[Out] ((a*F^(c + d*x))^m*(b*F^(e + f*x))^n)/((d*m + f*n)*Log[F])
```

Rule 2225

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2259

```
Int[(u_.)*(F_)^((a_.) + (b_.)*(v_)), x_Symbol] :> Int[u*F^(a + b*NormalizeP
owerOfLinear[v, x]), x] /; FreeQ[{F, a, b}, x] && PolynomialQ[u, x] && Powe
rOfLinearQ[v, x] &&  !PowerOfLinearMatchQ[v, x]
```

Rule 2319

```
Int[(u_.)*((a_.)*(F_)^(v_))^(n_), x_Symbol] :> Dist[(a*F^v)^n/F^(n*v), Int[
u*F^(n*v), x], x] /; FreeQ[{F, a, n}, x] &&  !IntegerQ[n]
```

Rubi steps

$$\begin{aligned}\int \frac{\text{F0}(x)}{x+\text{F0}(x)}\,dx &= \int \left(1-\frac{x}{x+\text{F0}(x)}\right)dx\\ &= x-\int \frac{x}{x+\text{F0}(x)}\,dx\end{aligned}$$

Mathematica [A]
time = 0.07, size = 36, normalized size = 1.00

$$\frac{\left(aF^{c+dx}\right)^m \left(bF^{e+fx}\right)^n}{dm\log(F)+fn\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*F^(c + d*x))^m*(b*F^(e + f*x))^n,x]
```

```
[Out] ((a*F^(c + d*x))^m*(b*F^(e + f*x))^n)/(d*m*Log[F] + f*n*Log[F])
```

Maple [A]
time = 0.22, size = 37, normalized size = 1.03

method	result
gosper	$\frac{\left(a\,F^{dx+c}\right)^{m}\left(b\,F^{fx+e}\right)^{n}}{(md+fn)\ln(F)}$
risch	$\mathrm{e}^{-\frac{i\pi\mathrm{csgn}\left(ia\,F^{dx+c}\right)^{3}m}{2}+\frac{i\pi\mathrm{csgn}\left(ia\,F^{dx+c}\right)^{2}\mathrm{csgn}(ia)m}{2}+\frac{i\pi\mathrm{csgn}\left(ia\,F^{dx+c}\right)^{2}\mathrm{csgn}\left(iF^{dx+c}\right)m}{2}-\frac{i\pi\,\mathrm{csgn}\left(ia\,F^{dx+c}\right)\mathrm{csgn}(ia)\mathrm{csgn}\left(iF^{dx+c}\right)m}{2}+m\,\mathrm{l}}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*F^(d*x+c))^m*(b*F^(f*x+e))^n,x,method=_RETURNVERBOSE)
```

```
[Out] (a*F^(d*x+c))^m*(b*F^(f*x+e))^n/(d*m+f*n)/ln(F)
```

Maxima [A]
time = 0.33, size = 59, normalized size = 1.64

$$\frac{F^{-\frac{cfn}{d}+ne}a^m b^n e^{\left((dx+c)m\log(F)+\frac{(dx+c)fn\log(F)}{d}\right)}}{(dm+fn)\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a*F^(d*x+c))^m*(b*F^(f*x+e))^n,x, algorithm="maxima")
```

```
[Out] F^(-c*f*n/d + n*e)*a^m*b^n*e^((d*x + c)*m*log(F) + (d*x + c)*f*n*log(F)/d)/
((d*m + f*n)*log(F))
```

Fricas [A]
time = 0.37, size = 47, normalized size = 1.31

$$\frac{e^{((dmx+cm)\log(F)+(fnx+ne)\log(F)+m\log(a)+n\log(b))}}{(dm+fn)\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a*F^(d*x+c))^m*(b*F^(f*x+e))^n,x, algorithm="fricas")
```

```
[Out] e^((d*m*x + c*m)*log(F) + (f*n*x + n*e)*log(F) + m*log(a) + n*log(b))/((d*m
 + f*n)*log(F))
```

Sympy [B] Leaf count of result is larger than twice the leaf count of optimal. 85 vs. $2(29) = 58$.
time = 6.53, size = 85, normalized size = 2.36

$$\begin{cases} a^m b^n x & \text{for } F = 1 \wedge \left(F = 1 \vee d = -\frac{fn}{m}\right) \\ x\left(F^c F^{-\frac{fnx}{m}} a\right)^m \left(F^e F^{fx} b\right)^n & \text{for } d = -\frac{fn}{m} \\ \frac{\left(F^c F^{dx} a\right)^m \left(F^e F^{fx} b\right)^n}{dm \log\left(F\right) + fn \log\left(F\right)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a*F**(d*x+c))**m*(b*F**(f*x+e))**n,x)
```

```
[Out] Piecewise((a**m*b**n*x, Eq(F, 1) & (Eq(F, 1) | Eq(d, -f*n/m))), (x*(F**c*a/
F**(f*n*x/m))**m*(F**e*F**(f*x)*b)**n, Eq(d, -f*n/m)), ((F**c*F**(d*x)*a)**
m*(F**e*F**(f*x)*b)**n/(d*m*log(F) + f*n*log(F)), True))
```

Giac [A]
time = 3.31, size = 47, normalized size = 1.31

$$\frac{e^{(dmx \log(F) + fnx \log(F) + cm \log(F) + ne \log(F) + m \log(a) + n \log(b))}}{dm \log\left(F\right) + fn \log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a*F^(d*x+c))^m*(b*F^(f*x+e))^n,x, algorithm="giac")
```

```
[Out] e^(d*m*x*log(F) + f*n*x*log(F) + c*m*log(F) + n*e*log(F) + m*log(a) + n*log
(b))/(d*m*log(F) + f*n*log(F))
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.03

$$\int \left(F^{c+d\,x}\,a\right)^m\,\left(F^{e+f\,x}\,b\right)^n \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((F^(c + d*x)*a)^m*(F^(e + f*x)*b)^n,x)
```

```
[Out] int((F^(c + d*x)*a)^m*(F^(e + f*x)*b)^n, x)
```

3.763 $\int e^{a+c+bx^n+dx^n}\,dx$

Optimal. Leaf size=37

$$-\frac{e^{a+c}x(-((b+d)x^n))^{-1/n}\,\Gamma\left(\frac{1}{n},-((b+d)x^n)\right)}{n}$$

```
[Out] -exp(a+c)*x*GAMMA(1/n,-(b+d)*x^n)/n/((-(b+d)*x^n)^(1/n))
```

Rubi [A]
time = 0.02, antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {6873, 2239}

$$-\frac{xe^{a+c}(-((b+d)x^n))^{-1/n}\,\mathrm{Gamma}\left(\frac{1}{n},-((b+d)x^n)\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + c + b*x^n + d*x^n),x]
```

```
[Out] -((E^(a + c)*x*Gamma[n^(-1), -((b + d)*x^n)])/(n*(-((b + d)*x^n))^n^(-1)))
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 6873

```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

Rubi steps

$$\begin{aligned}\int \frac{\mathrm{F0}(x)}{x^2+\mathrm{F0}(x)}\,dx &= \int \left(1-\frac{x^2}{x^2+\mathrm{F0}(x)}\right)dx\\ &= x-\int \frac{x^2}{x^2+\mathrm{F0}(x)}\,dx\end{aligned}$$

Mathematica [A]
time = 0.01, size = 37, normalized size = 1.00

$$-\frac{e^{a+c}x(-((b+d)x^n))^{-1/n}\,\Gamma\left(\frac{1}{n},-((b+d)x^n)\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + c + b*x^n + d*x^n),x]
[Out] -((E^(a + c)*x*Gamma[n^(-1), -((b + d)*x^n)])/(n*(-((b + d)*x^n))^n^(-1)))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.03, size = 241, normalized size = 6.51

method	result
meijerg	$\frac{e^{a+c}(-b-d)^{-\frac{1}{n}}\left(\frac{n^2 x^{-n+1}(-b-d)^{\frac{1}{n}-1}(n\,x^n(-b-d)+n+1)(x^n(-b-d))^{-\frac{1+n}{2n}}e^{-\frac{x^n(-b-d)}{2}}\,\mathrm{WhittakerM}\left(\frac{1}{n}-\frac{1+n}{2n},\frac{1+n}{2n}+\frac{1}{2},x^n(-b-d)\right)}{(1+n)(2n+1)}+\frac{n\cdots}{\cdots}\right.}{n}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a+c+b*x^n+d*x^n),x,method=_RETURNVERBOSE)
[Out] exp(a+c)/n*(-b-d)^(-1/n)*(n^2*x^(-n+1)*(-b-d)^(1/n-1)*(n*x^n*(-b-d)+n+1)/(1
+n)/(2*n+1)*(x^n*(-b-d))^(-1/2*(1+n)/n)*exp(-1/2*x^n*(-b-d))*WhittakerM(1/n
-1/2*(1+n)/n,1/2*(1+n)/n+1/2,x^n*(-b-d))+n*x^(-n+1)*(-b-d)^(1/n-1)*(1+n)/(2
*n+1)*(x^n*(-b-d))^(-1/2*(1+n)/n)*exp(-1/2*x^n*(-b-d))*WhittakerM(1/n-1/2*(
1+n)/n+1,1/2*(1+n)/n+1/2,x^n*(-b-d)))
```

Maxima [A]
time = 0.08, size = 36, normalized size = 0.97

$$-\frac{xe^{(a+c)}\Gamma\left(\frac{1}{n},-(b+d)x^n\right)}{\left(-(b+d)x^n\right)^{\left(\frac{1}{n}\right)}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(a+c+b*x^n+d*x^n),x, algorithm="maxima")
[Out] -x*e^(a + c)*gamma(1/n, -(b + d)*x^n)/((-(b + d)*x^n)^(1/n)*n)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(a+c+b*x^n+d*x^n),x, algorithm="fricas")
[Out] integral(e^((b + d)*x^n + a + c), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$e^a e^c \int e^{bx^n} e^{dx^n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(a+c+b*x**n+d*x**n),x)
```

```
[Out] exp(a)*exp(c)*Integral(exp(b*x**n)*exp(d*x**n), x)
```

Giac [**F**]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(a+c+b*x^n+d*x^n),x, algorithm="giac")
```

```
[Out] integrate(e^(b*x^n + d*x^n + a + c), x)
```

Mupad [**F**]
time = 0.00, size = -1, normalized size = -0.03

$$\int \mathrm{e}^{a+c+b\,x^n+d\,x^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + c + b*x^n + d*x^n),x)
```

```
[Out] int(exp(a + c + b*x^n + d*x^n), x)
```

3.764 $\int f^{a+bx^n} g^{c+dx^n} \, dx$

Optimal. Leaf size=50

$$-\frac{f^a g^c x \Gamma\left(\frac{1}{n}, -x^n (b \log(f) + d \log(g))\right) \left(-x^n (b \log(f) + d \log(g))\right)^{-1/n}}{n}$$

```
[Out] -f^a*g^c*x*GAMMA(1/n,-x^n*(b*ln(f)+d*ln(g)))/n/((-x^n*(b*ln(f)+d*ln(g)))^(1
/n))
```

Rubi [A]
time = 0.03, antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.105$, Rules used = {2325, 2239}

$$-\frac{x f^a g^c (-x^n (b \log(f) + d \log(g)))^{-1/n} \operatorname{Gamma}\left(\frac{1}{n}, -x^n (b \log(f) + d \log(g))\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)*g^(c + d*x^n),x]
```

```
[Out] -((f^a*g^c*x*Gamma[n^(-1), -(x^n*(b*Log[f] + d*Log[g]))])/(n*(-(x^n*(b*Log[
f] + d*Log[g])))^n^(-1)))
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2325

```
Int[(u_.)*(F_)^(v_)*(G_)^(w_), x_Symbol] :> With[{z = v*Log[F] + w*Log[G]},
 Int[u*NormalizeIntegrand[E^z, x], x] /; BinomialQ[z, x] || (PolynomialQ[z,
 x] && LeQ[Exponent[z, x], 2])] /; FreeQ[{F, G}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{\mathrm{F0}(x)}{(x+\mathrm{F0}(x))^2} \, dx &= \int \left(-\frac{x}{(x+\mathrm{F0}(x))^2} + \frac{1}{x+\mathrm{F0}(x)}\right) dx \\ &= -\int \frac{x}{(x+\mathrm{F0}(x))^2} \, dx + \int \frac{1}{x+\mathrm{F0}(x)} \, dx\end{aligned}$$

Mathematica [A]
time = 0.02, size = 50, normalized size = 1.00

$$-\frac{f^a g^c x \Gamma\left(\frac{1}{n}, -x^n(b\log(f)+d\log(g))\right)\left(-x^n(b\log(f)+d\log(g))\right)^{-1/n}}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*g^(c + d*x^n),x]
```

```
[Out] -((f^a*g^c*x*Gamma[n^(-1), -(x^n*(b*Log[f] + d*Log[g]))])/(n*(-(x^n*(b*Log[
f] + d*Log[g])))^n^(-1)))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.06, size = 298, normalized size = 5.96

method	result
meijerg	$\frac{f^a g^c (-d)^{-\frac{1}{n}} \ln(g)^{-\frac{1}{n}} \left(1+\frac{b\ln(f)}{d\ln(g)}\right)^{-\frac{1}{n}} \left(\frac{n x (-d)^{\frac{1}{n}} \ln(g)^{\frac{1}{n}} \left(1+\frac{b\ln(f)}{d\ln(g)}\right)^{\frac{1}{n}} \left(x^n d\ln(g)\left(1+\frac{b\ln(f)}{d\ln(g)}\right)n+n+1\right)\Gamma\left(1-\frac{1}{n}\right)\Gamma\left(\frac{1+n}{n}+1\right) L_{-\frac{1}{n}}^{\left(\frac{1+n}{n}\right)}\left(x^n d\ln\right.}{(1+n)\Gamma\left(-\frac{1}{n}+\frac{1+n}{n}+1\right)}\right.}{n}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b*x^n)*g^(c+d*x^n),x,method=_RETURNVERBOSE)
```

```
[Out] f^a*g^c/n*(-d)^(-1/n)*ln(g)^(-1/n)*(1+b*ln(f)/d/ln(g))^(-1/n)*(n*x*(-d)^(1/
n)*ln(g)^(1/n)*(1+b*ln(f)/d/ln(g))^(1/n)*(x^n*d*ln(g)*(1+b*ln(f)/d/ln(g))*n
+n+1)/(1+n)/GAMMA(-1/n+(1+n)/n+1)*GAMMA(1-1/n)*GAMMA((1+n)/n+1)*LaguerreL(-
1/n,(1+n)/n,x^n*d*ln(g)*(1+b*ln(f)/d/ln(g)))-n^2*x^(1+n)*(-d)^(1/n)*ln(g)^(
1+1/n)*(1+b*ln(f)/d/ln(g))^(1+1/n)*d/(1+n)*LaguerreL(-1/n,(1+n)/n+1,x^n*d*l
n(g)*(1+b*ln(f)/d/ln(g)))*GAMMA(1-1/n)*GAMMA((1+n)/n+1)/GAMMA(-1/n+(1+n)/n+
1))
```

Maxima [A]
time = 0.12, size = 50, normalized size = 1.00

$$-\frac{f^a g^c x \Gamma\left(\frac{1}{n}, -(b\log(f)+d\log(g))x^n\right)}{\left(-(b\log(f)+d\log(g))x^n\right)^{\left(\frac{1}{n}\right)} n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*g^(c+d*x^n),x, algorithm="maxima")
```

```
[Out] -f^a*g^c*x*gamma(1/n, -(b*log(f) + d*log(g))*x^n)/((-(b*log(f) + d*log(g))*
x^n)^(1/n)*n)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*g^(c+d*x^n),x, algorithm="fricas")
```

```
[Out] integral(f^(b*x^n + a)*g^(d*x^n + c), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\begin{cases} \int f^{a+\frac{b}{x}} g^{c+\frac{d}{x}}\, dx & \text{for}\ n = -1 \\ bdf^{a} f^{\frac{b}{\sqrt{x}}} g^{c} g^{\frac{d}{\sqrt{x}}} \log(f) \log(g) \log(x) + bdf^{a} f^{\frac{b}{\sqrt{x}}} g^{c} g^{\frac{d}{\sqrt{x}}} \log(f) \log(g) + bf^{a} f^{\frac{b}{\sqrt{x}}} g^{c} g^{\frac{d}{\sqrt{x}}} \sqrt{x} \log(f) + df^{a} f^{\frac{b}{\sqrt{x}}} g^{c} g^{\frac{d}{\sqrt{x}}} \sqrt{x} \log(g) + f^{a} f^{\frac{b}{\sqrt{x}}} g^{c} g^{\frac{d}{\sqrt{x}}} x & \text{for}\ n = -\frac{1}{2} \\ \frac{2bdf^{a} f^{bx^{n}} g^{c} g^{dx^{n}} n^{2} x x^{2n} \log(f) \log(g)}{2n^{2}+3n+1} - \frac{2bf^{a} f^{bx^{n}} g^{c} g^{dx^{n}} n^{2} x x^{n} \log(f)}{2n^{2}+3n+1} - \frac{bf^{a} f^{bx^{n}} g^{c} g^{dx^{n}} n x x^{n} \log(f)}{2n^{2}+3n+1} - \frac{2df^{a} f^{bx^{n}} g^{c} g^{dx^{n}} n^{2} x x^{n} \log(g)}{2n^{2}+3n+1} - \frac{df^{a} f^{bx^{n}} g^{c} g^{dx^{n}} n x x^{n} \log(g)}{2n^{2}+3n+1} + \frac{2f^{a} f^{bx^{n}} g^{c} g^{dx^{n}} n^{2} x}{2n^{2}+3n+1} + \frac{3f^{a} f^{bx^{n}} g^{c} g^{dx^{n}} n x}{2n^{2}+3n+1} + \frac{f^{a} f^{bx^{n}} g^{c} g^{dx^{n}} x}{2n^{2}+3n+1} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*g**(c+d*x**n),x)
```

```
[Out] Piecewise((Integral(f**(a + b/x)*g**(c + d/x), x), Eq(n, -1)), (b*d*f**a*f*
*(b/sqrt(x))*g**c*g**(d/sqrt(x))*log(f)*log(g)*log(x) + b*d*f**a*f**(b/sqrt
(x))*g**c*g**(d/sqrt(x))*log(f)*log(g) + b*f**a*f**(b/sqrt(x))*g**c*g**(d/s
qrt(x))*sqrt(x)*log(f) + d*f**a*f**(b/sqrt(x))*g**c*g**(d/sqrt(x))*sqrt(x)*
log(g) + f**a*f**(b/sqrt(x))*g**c*g**(d/sqrt(x))*x, Eq(n, -1/2)), (2*b*d*f*
*a*f**(b*x**n)*g**c*g**(d*x**n)*n**2*x*x**(2*n)*log(f)*log(g)/(2*n**2 + 3*n
 + 1) - 2*b*f**a*f**(b*x**n)*g**c*g**(d*x**n)*n**2*x*x**n*log(f)/(2*n**2 +
3*n + 1) - b*f**a*f**(b*x**n)*g**c*g**(d*x**n)*n*x*x**n*log(f)/(2*n**2 + 3*
n + 1) - 2*d*f**a*f**(b*x**n)*g**c*g**(d*x**n)*n**2*x*x**n*log(g)/(2*n**2 +
 3*n + 1) - d*f**a*f**(b*x**n)*g**c*g**(d*x**n)*n*x*x**n*log(g)/(2*n**2 + 3
*n + 1) + 2*f**a*f**(b*x**n)*g**c*g**(d*x**n)*n**2*x/(2*n**2 + 3*n + 1) + 3
*f**a*f**(b*x**n)*g**c*g**(d*x**n)*n*x/(2*n**2 + 3*n + 1) + f**a*f**(b*x**n
)*g**c*g**(d*x**n)*x/(2*n**2 + 3*n + 1), True))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*g^(c+d*x^n),x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^n + a)*g^(d*x^n + c), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.02

$$\int f^{a+b\,x^n}\,g^{c+d\,x^n} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)*g^(c + d*x^n),x)
```

```
[Out] int(f^(a + b*x^n)*g^(c + d*x^n), x)
```

3.765 $\int e^{x^n} x^m \, dx$

Optimal. Leaf size=37

$$-\frac{x^{1+m}(-x^n)^{-\frac{1+m}{n}}\,\Gamma\left(\frac{1+m}{n},-x^n\right)}{n}$$

```
[Out] -x^(1+m)*GAMMA((1+m)/n,-x^n)/n/((-x^n)^((1+m)/n))
```

Rubi [A]
time = 0.01, antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2250}

$$-\frac{x^{m+1}(-x^n)^{-\frac{m+1}{n}}\,\text{Gamma}\left(\frac{m+1}{n},-x^n\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Int[E^x^n*x^m,x]
```

```
[Out] -((x^(1 + m)*Gamma[(1 + m)/n, -x^n])/(n*(-x^n)^((1 + m)/n)))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{\text{F0}(x)}{\left(x^2+\text{F0}(x)\right)^2}\,dx &= \int \left(-\frac{x^2}{\left(x^2+\text{F0}(x)\right)^2}+\frac{1}{x^2+\text{F0}(x)}\right)dx\\ &= -\int \frac{x^2}{\left(x^2+\text{F0}(x)\right)^2}\,dx+\int \frac{1}{x^2+\text{F0}(x)}\,dx\end{aligned}$$

Mathematica [A]
time = 0.01, size = 37, normalized size = 1.00

$$-\frac{x^{1+m}(-x^n)^{-\frac{1+m}{n}}\,\Gamma\left(\frac{1+m}{n},-x^n\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x^n*x^m,x]
```

```
[Out] -((x^(1 + m)*Gamma[(1 + m)/n, -x^n])/(n*(-x^n)^((1 + m)/n)))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.03, size = 219, normalized size = 5.92

method	result
meijerg	$\frac{(-1)^{-\frac{m}{n}-\frac{1}{n}} \left(\frac{n\, x^{1+m} (-1)^{\frac{m}{n}+\frac{1}{n}} (x^n n+m+n+1) L_{-\frac{1+m}{n}}^{\left(\frac{1+m+n}{n}\right)}(x^n)\Gamma\left(-\frac{1+m}{n}+1\right)\Gamma\left(\frac{1+m+n}{n}+1\right)}{(1+m)(1+m+n)\Gamma\left(-\frac{1+m}{n}+\frac{1+m+n}{n}+1\right)} - \frac{(-1)^{\frac{m}{n}+\frac{1}{n}} n^2 x^{1+m+n} L_{-\frac{1+m}{n}}^{\left(\frac{1+m+n}{n}+1\right)}(x^n}{(1+m)(1+m+n)\Gamma\left(-\frac{1+m}{n}\right.}}{n}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^n)*x^m,x,method=_RETURNVERBOSE)
```

```
[Out] (-1)^(-m/n-1/n)/n*(n/(1+m)*x^(1+m)*(-1)^(m/n+1/n)*(x^n*n+m+n+1)/(1+m+n)*Lag
uerreL(-(1+m)/n,(1+m+n)/n,x^n)*GAMMA(-(1+m)/n+1)*GAMMA((1+m+n)/n+1)/GAMMA(-
(1+m)/n+(1+m+n)/n+1)-(-1)^(m/n+1/n)*n^2/(1+m)*x^(1+m+n)/(1+m+n)*LaguerreL(-
(1+m)/n,(1+m+n)/n+1,x^n)*GAMMA(-(1+m)/n+1)*GAMMA((1+m+n)/n+1)/GAMMA(-(1+m)/
n+(1+m+n)/n+1))
```

Maxima [A]
time = 0.07, size = 38, normalized size = 1.03

$$-\frac{x^{m+1}\Gamma\left(\frac{m+1}{n}, -x^n\right)}{n\left(-x^n\right)^{\frac{m+1}{n}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^n)*x^m,x, algorithm="maxima")
```

```
[Out] -x^(m + 1)*gamma((m + 1)/n, -x^n)/(n*(-x^n)^((m + 1)/n))
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^n)*x^m,x, algorithm="fricas")
```

```
[Out] integral(x^m*e^(x^n), x)
```

Sympy [C] Result contains complex when optimal does not.
time = 0.69, size = 105, normalized size = 2.84

$$\frac{me^{-\frac{i\pi}{n}}e^{-\frac{i\pi m}{n}}\Gamma\left(\frac{m}{n}+\frac{1}{n}\right)\gamma\left(\frac{m}{n}+\frac{1}{n}, x^n e^{i\pi}\right)}{n^2\Gamma\left(\frac{m}{n}+1+\frac{1}{n}\right)} + \frac{e^{-\frac{i\pi}{n}}e^{-\frac{i\pi m}{n}}\Gamma\left(\frac{m}{n}+\frac{1}{n}\right)\gamma\left(\frac{m}{n}+\frac{1}{n}, x^n e^{i\pi}\right)}{n^2\Gamma\left(\frac{m}{n}+1+\frac{1}{n}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**n)*x**m,x)
```

```
[Out] m*exp(-I*pi/n)*exp(-I*pi*m/n)*gamma(m/n + 1/n)*lowergamma(m/n + 1/n, x**n*e
xp_polar(I*pi))/(n**2*gamma(m/n + 1 + 1/n)) + exp(-I*pi/n)*exp(-I*pi*m/n)*g
amma(m/n + 1/n)*lowergamma(m/n + 1/n, x**n*exp_polar(I*pi))/(n**2*gamma(m/n
 + 1 + 1/n))
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^n)*x^m,x, algorithm="giac")
```

```
[Out] integrate(x^m*e^(x^n), x)
```

Mupad [B]
time = 3.75, size = 58, normalized size = 1.57

$$\frac{x^{m+1}\,\mathrm{e}^{\frac{x^n}{2}}\,\mathrm{M}_{1-\frac{m+n+1}{2\,n},\frac{m+n+1}{2\,n}-\frac{1}{2}}\left(x^n\right)}{{\left(x^n\right)}^{\frac{m+n+1}{2\,n}}\,\left(m+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*exp(x^n),x)
```

```
[Out] (x^(m + 1)*exp(x^n/2)*whittakerM(1 - (m + n + 1)/(2*n), (m + n + 1)/(2*n) -
 1/2, x^n))/((x^n)^((m + n + 1)/(2*n))*(m + 1))
```

3.766 $\int f^{x^n} x^m \, dx$

Optimal. Leaf size=41

$$-\frac{x^{1+m}\Gamma\left(\frac{1+m}{n},-x^n\log(f)\right)\left(-x^n\log(f)\right)^{-\frac{1+m}{n}}}{n}$$

```
[Out] -x^(1+m)*GAMMA((1+m)/n,-x^n*ln(f))/n/((-x^n*ln(f))^((1+m)/n))
```

Rubi [A]
time = 0.01, antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2250}

$$-\frac{x^{m+1}(\log(f)(-x^n))^{-\frac{m+1}{n}}\text{Gamma}\left(\frac{m+1}{n},\log(f)(-x^n)\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Int[f^x^n*x^m,x]
```

```
[Out] -((x^(1 + m)*Gamma[(1 + m)/n, -(x^n*Log[f])])/(n*(-(x^n*Log[f]))^((1 + m)/n
)))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\begin{aligned}
\int \left(aF^{c+dx}\right)^m \left(bF^{e+fx}\right)^n \, dx &= \left(F^{-m(c+dx)}\left(aF^{c+dx}\right)^m\right)\int F^{m(c+dx)}\left(bF^{e+fx}\right)^n \, dx\\
&= \left(F^{-m(c+dx)-n(e+fx)}\left(aF^{c+dx}\right)^m \left(bF^{e+fx}\right)^n\right)\int F^{m(c+dx)+n(e+fx)} \, dx\\
&= \left(F^{-m(c+dx)-n(e+fx)}\left(aF^{c+dx}\right)^m \left(bF^{e+fx}\right)^n\right)\int F^{cm+en+(dm+fn)x} \, dx\\
&= \frac{\left(aF^{c+dx}\right)^m \left(bF^{e+fx}\right)^n}{(dm+fn)\log(F)}
\end{aligned}$$

Mathematica [A]
time = 0.01, size = 41, normalized size = 1.00

$$-\frac{x^{1+m}\Gamma\left(\frac{1+m}{n},-x^n\log(f)\right)\left(-x^n\log(f)\right)^{-\frac{1+m}{n}}}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^x^n*x^m,x]
```

```
[Out] -((x^(1 + m)*Gamma[(1 + m)/n, -(x^n*Log[f])])/(n*(-(x^n*Log[f]))^((1 + m)/n
)))
```

Maple [C] Result contains higher order function than in optimal. Order 9 vs. order 4.
time = 0.04, size = 267, normalized size = 6.51

method	result
meijerg	$\frac{(-1)^{-\frac{m}{n}-\frac{1}{n}} \ln(f)^{-\frac{m}{n}-\frac{1}{n}} \left(\frac{n\, x^{1+m} (-1)^{\frac{m}{n}+\frac{1}{n}} \ln(f)^{\frac{m}{n}+\frac{1}{n}} (x^n \ln(f) n+m+n+1) L_{-\frac{1+m}{n}}^{\left(\frac{1+m+n}{n}\right)}(x^n \ln(f)) \Gamma\left(-\frac{1+m}{n}+1\right) \Gamma\left(\frac{1+m+n}{n}+1\right)}{(1+m)(1+m+n) \Gamma\left(-\frac{1+m}{n}+\frac{1+m+n}{n}+1\right)} - \frac{(-1)^{\frac{m}{n}} \cdots}{\cdots}\right.}{n}$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(x^n)*x^m,x,method=_RETURNVERBOSE)
```

```
[Out] (-1)^(-m/n-1/n)*ln(f)^(-m/n-1/n)/n*(n/(1+m)*x^(1+m)*(-1)^(m/n+1/n)*ln(f)^(m
/n+1/n)*(x^n*ln(f)*n+m+n+1)/(1+m+n)*LaguerreL(-(1+m)/n,(1+m+n)/n,x^n*ln(f))
*GAMMA(-(1+m)/n+1)*GAMMA((1+m+n)/n+1)/GAMMA(-(1+m)/n+(1+m+n)/n+1)-(-1)^(m/n
+1/n)*n^2/(1+m)*x^(1+m+n)*ln(f)^(1+m/n+1/n)/(1+m+n)*LaguerreL(-(1+m)/n,(1+m
+n)/n+1,x^n*ln(f))*GAMMA(-(1+m)/n+1)*GAMMA((1+m+n)/n+1)/GAMMA(-(1+m)/n+(1+m
+n)/n+1))
```

Maxima [A]
time = 0.09, size = 42, normalized size = 1.02

$$-\frac{x^{m+1}\Gamma\left(\frac{m+1}{n}, -x^n \log\left(f\right)\right)}{\left(-x^n \log\left(f\right)\right)^{\frac{m+1}{n}} n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(x^n)*x^m,x, algorithm="maxima")
```

```
[Out] -x^(m + 1)*gamma((m + 1)/n, -x^n*log(f))/((-x^n*log(f))^((m + 1)/n)*n)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(x^n)*x^m,x, algorithm="fricas")
```

```
[Out] integral(f^(x^n)*x^m, x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{x^n} x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(x**n)*x**m,x)
```

```
[Out] Integral(f**(x**n)*x**m, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(x^n)*x^m,x, algorithm="giac")
```

```
[Out] integrate(f^(x^n)*x^m, x)
```

Mupad [B]
time = 3.78, size = 71, normalized size = 1.73

$$\frac{f^{x^n}\, x^{m+1}\, \mathrm{e}^{-\frac{x^n\,\ln(f)}{2}}\, \mathrm{M}_{1-\frac{m+n+1}{2\,n},\frac{m+n+1}{2\,n}-\frac{1}{2}}\left(x^n\,\ln\left(f\right)\right)}{\left(x^n\,\ln\left(f\right)\right)^{\frac{m+n+1}{2\,n}}\,\left(m+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(x^n)*x^m,x)
```

```
[Out] (f^(x^n)*x^(m + 1)*exp(-(x^n*log(f))/2)*whittakerM(1 - (m + n + 1)/(2*n), (
m + n + 1)/(2*n) - 1/2, x^n*log(f)))/((x^n*log(f))^((m + n + 1)/(2*n))*(m +
 1))
```

3.767 $\int e^{(a+bx)^n}(a+bx)^m\,dx$

Optimal. Leaf size=52

$$-\frac{(a+bx)^{1+m}\left(-(a+bx)^n\right)^{-\frac{1+m}{n}}\Gamma\left(\frac{1+m}{n},-(a+bx)^n\right)}{bn}$$

```
[Out] -(b*x+a)^(1+m)*GAMMA((1+m)/n,-(b*x+a)^n)/b/n/((-(b*x+a)^n)^((1+m)/n))
```

Rubi [A]
time = 0.02, antiderivative size = 52, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.059$, Rules used = {2250}

$$-\frac{(a+bx)^{m+1}\left(-(a+bx)^n\right)^{-\frac{m+1}{n}}\text{Gamma}\left(\frac{m+1}{n},-(a+bx)^n\right)}{bn}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x)^n*(a + b*x)^m,x]
```

```
[Out] -(((a + b*x)^(1 + m)*Gamma[(1 + m)/n, -(a + b*x)^n])/(b*n*(-(a + b*x)^n)^((
1 + m)/n)))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\begin{aligned}\int e^{a+c+bx^n+dx^n}\,dx &= \int e^{a+c+(b+d)x^n}\,dx\\ &= -\frac{e^{a+c}x\left(-(b+d)x^n\right)^{-1/n}\Gamma\left(\frac{1}{n},-(b+d)x^n\right)}{n}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 52, normalized size = 1.00

$$-\frac{(a+bx)^{1+m}\left(-(a+bx)^n\right)^{-\frac{1+m}{n}}\Gamma\left(\frac{1+m}{n},-(a+bx)^n\right)}{bn}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x)^n*(a + b*x)^m,x]
```

```
[Out] -(((a + b*x)^(1 + m)*Gamma[(1 + m)/n, -(a + b*x)^n])/(b*n*(-(a + b*x)^n)^((
1 + m)/n)))
```

Maple [F]
time = 0.02, size = 0, normalized size = 0.00

$$\int \mathrm{e}^{(bx+a)^n} (bx+a)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((b*x+a)^n)*(b*x+a)^m,x)
```

```
[Out] int(exp((b*x+a)^n)*(b*x+a)^m,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)^n)*(b*x+a)^m,x, algorithm="maxima")
```

```
[Out] integrate((b*x + a)^m*e^((b*x + a)^n), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)^n)*(b*x+a)^m,x, algorithm="fricas")
```

```
[Out] integral((b*x + a)^m*e^((b*x + a)^n), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int (a+bx)^m e^{(a+bx)^n} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)**n)*(b*x+a)**m,x)
```

```
[Out] Integral((a + b*x)**m*exp((a + b*x)**n), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)^n)*(b*x+a)^m,x, algorithm="giac")
```

```
[Out] integrate((b*x + a)^m*e^((b*x + a)^n), x)
```

Mupad [B]
time = 3.89, size = 77, normalized size = 1.48

$$\frac{e^{\frac{(a+b\,x)^n}{2}}\,(a+b\,x)^{m+1}\,\mathrm{M}_{1-\frac{m+n+1}{2\,n},\frac{m+n+1}{2\,n}-\frac{1}{2}}\left((a+b\,x)^n\right)}{b\left((a+b\,x)^n\right)^{\frac{m+n+1}{2\,n}}\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((a + b*x)^n)*(a + b*x)^m,x)
```

```
[Out] (exp((a + b*x)^n/2)*(a + b*x)^(m + 1)*whittakerM(1 - (m + n + 1)/(2*n), (m
+ n + 1)/(2*n) - 1/2, (a + b*x)^n))/(b*((a + b*x)^n)^((m + n + 1)/(2*n))*(m
 + 1))
```

3.768 $\int f^{(a+bx)^n}(a+bx)^m\,dx$

Optimal. Leaf size=56

$$-\frac{(a+bx)^{1+m}\Gamma\left(\frac{1+m}{n},-(a+bx)^n\log(f)\right)\left(-(a+bx)^n\log(f)\right)^{-\frac{1+m}{n}}}{bn}$$

```
[Out] -(b*x+a)^(1+m)*GAMMA((1+m)/n,-(b*x+a)^n*ln(f))/b/n/((-(b*x+a)^n*ln(f))^((1+
m)/n))
```

Rubi [A]
time = 0.02, antiderivative size = 56, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.059$, Rules used = {2250}

$$-\frac{(a+bx)^{m+1}\left(\log(f)\left(-(a+bx)^n\right)\right)^{-\frac{m+1}{n}}\text{Gamma}\left(\frac{m+1}{n},\log(f)\left(-(a+bx)^n\right)\right)}{bn}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x)^n*(a + b*x)^m,x]
```

```
[Out] -(((a + b*x)^(1 + m)*Gamma[(1 + m)/n, -((a + b*x)^n*Log[f])])/(b*n*(-((a +
b*x)^n*Log[f]))^((1 + m)/n)))
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\begin{aligned}\int f^{a+bx^n}g^{c+dx^n}\,dx &= \int \exp\left(a\log(f)+c\log(g)+x^n(b\log(f)+d\log(g))\right)\,dx\\ &= -\frac{f^a g^c x\Gamma\left(\frac{1}{n},-x^n(b\log(f)+d\log(g))\right)\left(-x^n(b\log(f)+d\log(g))\right)^{-1/n}}{n}\end{aligned}$$

Mathematica [A]
time = 0.01, size = 56, normalized size = 1.00

$$-\frac{(a+bx)^{1+m}\Gamma\left(\frac{1+m}{n},-(a+bx)^n\log(f)\right)\left(-(a+bx)^n\log(f)\right)^{-\frac{1+m}{n}}}{bn}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x)^n*(a + b*x)^m,x]
```

```
[Out] -(((a + b*x)^(1 + m)*Gamma[(1 + m)/n, -((a + b*x)^n*Log[f])])/(b*n*(-((a +
b*x)^n*Log[f]))^((1 + m)/n)))
```

Maple [F]
time = 0.03, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^{n}} (bx+a)^{m}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^((b*x+a)^n)*(b*x+a)^m,x)
```

```
[Out] int(f^((b*x+a)^n)*(b*x+a)^m,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^((b*x+a)^n)*(b*x+a)^m,x, algorithm="maxima")
```

```
[Out] integrate((b*x + a)^m*f^((b*x + a)^n), x)
```

Fricas [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^((b*x+a)^n)*(b*x+a)^m,x, algorithm="fricas")
```

```
[Out] integral((b*x + a)^m*f^((b*x + a)^n), x)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int f^{(a+bx)^{n}} (a+bx)^{m}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**((b*x+a)**n)*(b*x+a)**m,x)
```

```
[Out] Integral(f**((a + b*x)**n)*(a + b*x)**m, x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^((b*x+a)^n)*(b*x+a)^m,x, algorithm="giac")
```

```
[Out] integrate((b*x + a)^m*f^((b*x + a)^n), x)
```

Mupad [B]
time = 4.01, size = 94, normalized size = 1.68

$$\frac{f^{(a+b\,x)^n}\,\mathrm{e}^{-\frac{\ln(f)\,(a+b\,x)^n}{2}}\,(a+b\,x)^{m+1}\,\mathrm{M}_{1-\frac{m+n+1}{2\,n},\frac{m+n+1}{2\,n}-\frac{1}{2}}\left(\ln(f)\,(a+b\,x)^n\right)}{b\,(m+1)\,\left(\ln(f)\,(a+b\,x)^n\right)^{\frac{m+n+1}{2\,n}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^((a + b*x)^n)*(a + b*x)^m,x)
```

```
[Out] (f^((a + b*x)^n)*exp(-(log(f)*(a + b*x)^n)/2)*(a + b*x)^(m + 1)*whittakerM(
1 - (m + n + 1)/(2*n), (m + n + 1)/(2*n) - 1/2, log(f)*(a + b*x)^n))/(b*(m
+ 1)*(log(f)*(a + b*x)^n)^((m + n + 1)/(2*n)))
```

3.769 $\int e^{(a+bx)^3}x\,dx$

Optimal. Leaf size=80

$$\frac{a(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b^2\sqrt[3]{-(a+bx)^3}}-\frac{(a+bx)^2\Gamma\left(\frac{2}{3},-(a+bx)^3\right)}{3b^2\left(-(a+bx)^3\right)^{2/3}}$$

```
[Out] 1/3*a*(b*x+a)*GAMMA(1/3,-(b*x+a)^3)/b^2/(-(b*x+a)^3)^(1/3)-1/3*(b*x+a)^2*GA
MMA(2/3,-(b*x+a)^3)/b^2/(-(b*x+a)^3)^(2/3)
```

Rubi [A]
time = 0.03, antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.273$, Rules used = {2258, 2239, 2250}

$$\frac{a(a+bx)\text{Gamma}\left(\frac{1}{3},-(a+bx)^3\right)}{3b^2\sqrt[3]{-(a+bx)^3}}-\frac{(a+bx)^2\text{Gamma}\left(\frac{2}{3},-(a+bx)^3\right)}{3b^2\left(-(a+bx)^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x)^3*x,x]
```

```
[Out] (a*(a + b*x)*Gamma[1/3, -(a + b*x)^3])/(3*b^2*(-(a + b*x)^3)^(1/3)) - ((a +
 b*x)^2*Gamma[2/3, -(a + b*x)^3])/(3*b^2*(-(a + b*x)^3)^(2/3))
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[(-F^a
)*(c + d*x)*(Gamma[1/n, (-b)*(c + d*x)^n*Log[F]]/(d*n*((-b)*(c + d*x)^n*Log
[F])^(1/n))), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2250

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[(-F^a)*((e + f*x)^(m + 1)/(f*n*((-b)*(c + d*x)^n*Log[
F])^((m + 1)/n)))*Gamma[(m + 1)/n, (-b)*(c + d*x)^n*Log[F]], x] /; FreeQ[{F
, a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2258

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int e^{x^n}x^m\,dx=-\frac{x^{1+m}(-x^n)^{-\frac{1+m}{n}}\,\Gamma\left(\frac{1+m}{n},-x^n\right)}{n}$$

Mathematica [A]
time = 0.03, size = 74, normalized size = 0.92

$$\frac{(a+bx)\left(a\sqrt[3]{-(a+bx)^3}\,\Gamma\left(\frac{1}{3},-(a+bx)^3\right)-(a+bx)\Gamma\left(\frac{2}{3},-(a+bx)^3\right)\right)}{3b^2\left(-(a+bx)^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x)^3*x,x]
```

```
[Out] ((a + b*x)*(a*(-(a + b*x)^3)^(1/3)*Gamma[1/3, -(a + b*x)^3] - (a + b*x)*Gam
ma[2/3, -(a + b*x)^3]))/(3*b^2*(-(a + b*x)^3)^(2/3))
```

Maple [F]
time = 0.01, size = 0, normalized size = 0.00

$$\int e^{(bx+a)^3}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((b*x+a)^3)*x,x)
```

```
[Out] int(exp((b*x+a)^3)*x,x)
```

Maxima [F]
time = 0.00, size = 0, normalized size = 0.00

Failed to integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)^3)*x,x, algorithm="maxima")
```

```
[Out] integrate(x*e^((b*x + a)^3), x)
```

Fricas [A]
time = 0.08, size = 89, normalized size = 1.11

$$-\frac{(-b^3)^{\frac{2}{3}}\,a\Gamma\left(\frac{1}{3},-b^3x^3-3\,ab^2x^2-3\,a^2bx-a^3\right)-(-b^3)^{\frac{1}{3}}\,b\Gamma\left(\frac{2}{3},-b^3x^3-3\,ab^2x^2-3\,a^2bx-a^3\right)}{3\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)^3)*x,x, algorithm="fricas")
```

```
[Out] -1/3*((-b^3)^(2/3)*a*gamma(1/3, -b^3*x^3 - 3*a*b^2*x^2 - 3*a^2*b*x - a^3) -
 (-b^3)^(1/3)*b*gamma(2/3, -b^3*x^3 - 3*a*b^2*x^2 - 3*a^2*b*x - a^3))/b^4
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$e^{a^3}\int xe^{b^3x^3}e^{3ab^2x^2}e^{3a^2bx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)**3)*x,x)
```

```
[Out] exp(a**3)*Integral(x*exp(b**3*x**3)*exp(3*a*b**2*x**2)*exp(3*a**2*b*x), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)^3)*x,x, algorithm="giac")
```

```
[Out] integrate(x*e^((b*x + a)^3), x)
```

Mupad [F]
time = 0.00, size = -1, normalized size = -0.01

$$\int x\,\mathrm{e}^{(a+b\,x)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*exp((a + b*x)^3),x)
```

```
[Out] int(x*exp((a + b*x)^3), x)
```

3.770 $\int \frac{5x^2+3\sqrt[3]{e^x+x}+e^x(3x+2x^2)}{x\sqrt[3]{e^x+x}}\,dx$

Optimal. Leaf size=17

$$3x(e^x+x)^{2/3}+3\log(x)$$

```
[Out] 3*x*(x+exp(x))^(2/3)+3*ln(x)
```

Rubi [A]

time = 0.43, antiderivative size = 17, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 4, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}} = 0.093$, Rules used = {6874, 2293, 2305, 2294}

$$3(x+e^x)^{2/3}x+3\log(x)$$

Antiderivative was successfully verified.

```
[In] Int[(5*x^2 + 3*(E^x + x)^(1/3) + E^x*(3*x + 2*x^2))/(x*(E^x + x)^(1/3)),x]
```

```
[Out] 3*x*(E^x + x)^(2/3) + 3*Log[x]
```

Rule 2293

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_
))) + (a_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Simp[(a*x^n + b*F^(e*(c + d*x))
)^(p + 1)/(b*d*e*(p + 1)*Log[F]), x] - Dist[a*(n/(b*d*e*Log[F])), Int[x^(n
- 1)*(a*x^n + b*F^(e*(c + d*x)))^p, x], x] /; FreeQ[{F, a, b, c, d, e, n, p
}, x] && NeQ[p, -1]
```

Rule 2294

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*(x_)^(m_.)*((b_.)*(F_)^((e_.)*((c_.)
+ (d_.)*(x_))) + (a_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Simp[x^m*((a*x^n + b
*F^(e*(c + d*x)))^(p + 1)/(b*d*e*(p + 1)*Log[F])), x] + (-Dist[m/(b*d*e*(p
+ 1)*Log[F]), Int[x^(m - 1)*(a*x^n + b*F^(e*(c + d*x)))^(p + 1), x], x] - D
ist[a*(n/(b*d*e*Log[F])), Int[x^(m + n - 1)*(a*x^n + b*F^(e*(c + d*x)))^p,
x], x]) /; FreeQ[{F, a, b, c, d, e, m, n, p}, x] && NeQ[p, -1]
```

Rule 2305

```
Int[(x_)^(m_.)*(E^(x_) + (x_)^(m_.))^(n_), x_Symbol] :> Simp[-(E^x + x^m)^(
n + 1)/(n + 1), x] + (Dist[m, Int[x^(m - 1)*(E^x + x^m)^n, x], x] + Int[(E^
x + x^m)^(n + 1), x]) /; RationalQ[m, n] && GtQ[m, 0] && LtQ[n, 0] && NeQ[n
, -1]
```

Rule 6874

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int f^{x^n} x^m \, dx = -\frac{x^{1+m} \Gamma\left(\frac{1+m}{n}, -x^n \log(f)\right) \left(-x^n \log(f)\right)^{-\frac{1+m}{n}}}{n}$$

Mathematica [A]
time = 0.54, size = 17, normalized size = 1.00

$$3x(e^x + x)^{2/3} + 3\log(x)$$

Antiderivative was successfully verified.

```
[In] Integrate[(5*x^2 + 3*(E^x + x)^(1/3) + E^x*(3*x + 2*x^2))/(x*(E^x + x)^(1/3
)),x]
```

```
[Out] 3*x*(E^x + x)^(2/3) + 3*Log[x]
```

Maple [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{5x^2 + 3(e^x + x)^{\frac{1}{3}} + e^x(2x^2 + 3x)}{x\,(e^x + x)^{\frac{1}{3}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((5*x^2+3*(exp(x)+x)^(1/3)+exp(x)*(2*x^2+3*x))/x/(exp(x)+x)^(1/3),x)
```

```
[Out] int((5*x^2+3*(exp(x)+x)^(1/3)+exp(x)*(2*x^2+3*x))/x/(exp(x)+x)^(1/3),x)
```

Maxima [A]
time = 0.31, size = 21, normalized size = 1.24

$$\frac{3\,(x^2 + xe^x)}{(x + e^x)^{\frac{1}{3}}} + 3\,\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2+3*(exp(x)+x)^(1/3)+exp(x)*(2*x^2+3*x))/x/(exp(x)+x)^(1/3),
x, algorithm="maxima")
```

```
[Out] 3*(x^2 + x*e^x)/(x + e^x)^(1/3) + 3*log(x)
```

Fricas [F(-2)]
time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2+3*(exp(x)+x)^(1/3)+exp(x)*(2*x^2+3*x))/x/(exp(x)+x)^(1/3),
x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

Sympy [F]
time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2x^2e^x + 5x^2 + 3xe^x + 3\sqrt[3]{x + e^x}}{x\sqrt[3]{x + e^x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x**2+3*(exp(x)+x)**(1/3)+exp(x)*(2*x**2+3*x))/x/(exp(x)+x)**(1
/3),x)
```

```
[Out] Integral((2*x**2*exp(x) + 5*x**2 + 3*x*exp(x) + 3*(x + exp(x))**(1/3))/(x*(
x + exp(x))**(1/3)), x)
```

Giac [F]
time = 0.00, size = 0, normalized size = 0.00

could not integrate

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2+3*(exp(x)+x)^(1/3)+exp(x)*(2*x^2+3*x))/x/(exp(x)+x)^(1/3),
x, algorithm="giac")
```

```
[Out] integrate((5*x^2 + (2*x^2 + 3*x)*e^x + 3*(x + e^x)^(1/3))/((x + e^x)^(1/3)*
x), x)
```

Mupad [B]
time = 3.67, size = 14, normalized size = 0.82

$$3\,\ln\left(x\right)+3\,x\,{\left(x+\mathrm{e}^x\right)}^{2/3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((3*(x + exp(x))^(1/3) + exp(x)*(3*x + 2*x^2) + 5*x^2)/(x*(x + exp(x))^(
1/3)),x)
```

```
[Out] 3*log(x) + 3*x*(x + exp(x))^(2/3)
```

Chapter 4

Appendix

Local contents

4.1 Download section

The following zip files contain the raw integrals used in this test.

Mathematica format Mathematica_syntax.zip

Maple and Mupad format Maple_syntax.zip

Sympy format SYMPY_syntax.zip

Sage math format SAGE_syntax.zip

4.2 Listing of Grading functions

The following are the current version of the grading functions used for grading the quality of the antiderivative with reference to the optimal antiderivative included in the test suite.

There is a version for Maple and for Mathematica/Rubi. There is a version for grading Sympy and version for use with Sagemath.

The following are links to the current source code.

The following are the listings of source code of the grading functions.

4.2.1 Mathematica and Rubi grading function

```
(* Original version thanks to Albert Rich emailed on 03/21/2017 *)
(* ::Package:: *)

(* Nasser: April 7,2022. add second output which gives reason for the grade *)
(*                       Small rewrite of logic in main function to make it*)
(*                       match Maple's logic. No change in functionality otherwise*)

(* ::Subsection:: *)
(*GradeAntiderivative[result,optimal]*)


(* ::Text:: *)
(*If result and optimal are mathematical expressions, *)
(*         GradeAntiderivative[result,optimal] returns*)
(*  "F" if the result fails to integrate an expression that*)
(*      is integrable*)
(*  "C" if result involves higher level functions than necessary*)
(*  "B" if result is more than twice the size of the optimal*)
(*      antiderivative*)
(*  "A" if result can be considered optimal*)
```

```
GradeAntiderivative[result_,optimal_] := Module[{expnResult,expnOptimal,leafCountResult,leafC
    expnResult  = ExpnType[result];
    expnOptimal = ExpnType[optimal];
    leafCountResult = LeafCount[result];
    leafCountOptimal = LeafCount[optimal];

    (*Print["expnResult=",expnResult," expnOptimal=",expnOptimal];*)
    If[expnResult<=expnOptimal,
        If[Not[FreeQ[result,Complex]], (*result contains complex*)
            If[Not[FreeQ[optimal,Complex]], (*optimal contains complex*)
                If[leafCountResult<=2*leafCountOptimal,
                    finalresult={"A","none"}
                    ,(*ELSE*)
                    finalresult={"B","Both result and optimal contain complex but leaf count
                  ]
            ,(*ELSE*)
                finalresult={"C","Result contains complex when optimal does not."}
            ]
        ,(*ELSE*)(*result does not contains complex*)
            If[leafCountResult<=2*leafCountOptimal,
               finalresult={"A","none"}
            ,(*ELSE*)
               finalresult={"B","Leaf count is larger than twice the leaf count of optimal. $
              ]
        ]
    ,(*ELSE*) (*expnResult>expnOptimal*)
        If[FreeQ[result,Integrate] && FreeQ[result,Int],
            finalresult={"C","Result contains higher order function than in optimal. Order "<
            ,
            finalresult={"F","Contains unresolved integral."}
        ]
    ];

    finalresult
]

(* ::Text:: *)
(*The following summarizes the type number assigned an *)
(*expression based on the functions it involves*)
(*1 = rational function*)
(*2 = algebraic function*)
(*3 = elementary function*)
(*4 = special function*)
(*5 = hyperpergeometric function*)
(*6 = appell function*)
(*7 = rootsum function*)
(*8 = integrate function*)
```

```
(*9 = unknown function*)


ExpnType[expn_] :=
  If[AtomQ[expn],
    1,
  If[ListQ[expn],
    Max[Map[ExpnType,expn]],
  If[Head[expn]===Power,
    If[IntegerQ[expn[[2]]],
      ExpnType[expn[[1]]],
    If[Head[expn[[2]]]===Rational,
      If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,
        1,
      Max[ExpnType[expn[[1]]],2]],
    Max[ExpnType[expn[[1]]],ExpnType[expn[[2]]],3]]],
  If[Head[expn]===Plus || Head[expn]===Times,
    Max[ExpnType[First[expn]],ExpnType[Rest[expn]]],
  If[ElementaryFunctionQ[Head[expn]],
    Max[3,ExpnType[expn[[1]]]],
  If[SpecialFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
  If[HypergeometricFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
  If[AppellFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
  If[Head[expn]===RootSum,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
  If[Head[expn]===Integrate || Head[expn]===Int,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],8]],
  9]]]]]]]]]]


ElementaryFunctionQ[func_] :=
  MemberQ[{
  Exp,Log,
  Sin,Cos,Tan,Cot,Sec,Csc,
  ArcSin,ArcCos,ArcTan,ArcCot,ArcSec,ArcCsc,
  Sinh,Cosh,Tanh,Coth,Sech,Csch,
  ArcSinh,ArcCosh,ArcTanh,ArcCoth,ArcSech,ArcCsch
},func]


SpecialFunctionQ[func_] :=
  MemberQ[{
  Erf, Erfc, Erfi,
  FresnelS, FresnelC,
```

```
  ExpIntegralE, ExpIntegralEi, LogIntegral,
  SinIntegral, CosIntegral, SinhIntegral, CoshIntegral,
  Gamma, LogGamma, PolyGamma,
  Zeta, PolyLog, ProductLog,
  EllipticF, EllipticE, EllipticPi
},func]


HypergeometricFunctionQ[func_] :=
  MemberQ[{Hypergeometric1F1,Hypergeometric2F1,HypergeometricPFQ},func]


AppellFunctionQ[func_] :=
  MemberQ[{AppellF1},func]
```

4.2.2 Maple grading function

```
# File: GradeAntiderivative.mpl
# Original version thanks to Albert Rich emailed on 03/21/2017

#Nasser 03/22/2017  Use Maple leaf count instead since buildin
#Nasser 03/23/2017  missing 'ln' for ElementaryFunctionQ added
#Nasser 03/24/2017  corrected the check for complex result
#Nasser 10/27/2017  check for leafsize and do not call ExpnType()
#                   if leaf size is "too large". Set at 500,000
#Nasser 12/22/2019  Added debug flag, added 'dilog' to special functions
#                   see problem 156, file Apostol_Problems
#Nasser 4/07/2022   add second output which gives reason for the grade

GradeAntiderivative := proc(result,optimal)
local leaf_count_result,
        leaf_count_optimal,
        ExpnType_result,
        ExpnType_optimal,
        debug:=false;

        leaf_count_result:=leafcount(result);
        #do NOT call ExpnType() if leaf size is too large. Recursion problem
        if leaf_count_result > 500000 then
            return "B","result has leaf size over 500,000. Avoiding possible recursion issues
        fi;

        leaf_count_optimal := leafcount(optimal);
        ExpnType_result  := ExpnType(result);
        ExpnType_optimal := ExpnType(optimal);
```

```
        if debug then
            print("ExpnType_result",ExpnType_result," ExpnType_optimal=",ExpnType_optimal);
        fi;

# If result and optimal are mathematical expressions,
#  GradeAntiderivative[result,optimal] returns
#   "F" if the result fails to integrate an expression that
#       is integrable
#   "C" if result involves higher level functions than necessary
#   "B" if result is more than twice the size of the optimal
#       antiderivative
#   "A" if result can be considered optimal

    #This check below actually is not needed, since I only
    #call this grading only for passed integrals. i.e. I check
    #for "F" before calling this. But no harm of keeping it here.
    #just in case.


    if not type(result,freeof('int')) then
        return "F","Result contains unresolved integral";
    fi;


    if ExpnType_result<=ExpnType_optimal then
        if debug then
             print("ExpnType_result<=ExpnType_optimal");
        fi;
        if is_contains_complex(result) then
            if is_contains_complex(optimal) then
                if debug then
                        print("both result and optimal complex");
                fi;
                if leaf_count_result<=2*leaf_count_optimal then
                    return "A","";
                else
                   return "B",cat("Both result and optimal contain complex but leaf count of re
                                convert(leaf_count_result,string)," vs. $2 (",
                                convert(leaf_count_optimal,string)," ) = ",convert(2*leaf_co
                end if
            else #result contains complex but optimal is not
                if debug then
                        print("result contains complex but optimal is not");
                fi;
                return "C","Result contains complex when optimal does not.";
            fi;
        else # result do not contain complex
```

```
             # this assumes optimal do not as well. No check is needed here.
            if debug then
                   print("result do not contain complex, this assumes optimal do not as well"
            fi;
            if leaf_count_result<=2*leaf_count_optimal then
                if debug then
                    print("leaf_count_result<=2*leaf_count_optimal");
                fi;
                return "A","";
            else
                if debug then
                    print("leaf_count_result>2*leaf_count_optimal");
                fi;
                return "B",cat("Leaf count of result is larger than twice the leaf count of o
                               convert(leaf_count_result,string),"$ vs. $2(",
                               convert(leaf_count_optimal,string),")=",convert(2*leaf_cou
            fi;
        fi;
    else #ExpnType(result) > ExpnType(optimal)
        if debug then
            print("ExpnType(result) > ExpnType(optimal)");
        fi;
        return "C",cat("Result contains higher order function than in optimal. Order ",
                       convert(ExpnType_result,string)," vs. order ",
                       convert(ExpnType_optimal,string),".");
    fi;

end proc:

#
# is_contains_complex(result)
# takes expressions and returns true if it contains "I" else false
#
#Nasser 032417
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:

# The following summarizes the type number assigned an expression
# based on the functions it involves
# 1 = rational function
# 2 = algebraic function
# 3 = elementary function
# 4 = special function
# 5 = hyperpergeometric function
# 6 = appell function
# 7 = rootsum function
```

```
# 8 = integrate function
# 9 = unknown function

ExpnType := proc(expn)
  if type(expn,'atomic') then
    1
  elif type(expn,'list') then
    apply(max,map(ExpnType,expn))
  elif type(expn,'sqrt') then
    if type(op(1,expn),'rational') then
       1
    else
       max(2,ExpnType(op(1,expn)))
    end if
  elif type(expn,'`^`') then
    if type(op(2,expn),'integer') then
      ExpnType(op(1,expn))
    elif type(op(2,expn),'rational') then
      if type(op(1,expn),'rational') then
         1
      else
         max(2,ExpnType(op(1,expn)))
      end if
    else
         max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    end if
  elif type(expn,'`+`') or type(expn,'`*`') then
    max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif ElementaryFunctionQ(op(0,expn)) then
    max(3,ExpnType(op(1,expn)))
  elif SpecialFunctionQ(op(0,expn)) then
    max(4,apply(max,map(ExpnType,[op(expn)])))
  elif HypergeometricFunctionQ(op(0,expn)) then
    max(5,apply(max,map(ExpnType,[op(expn)])))
  elif AppellFunctionQ(op(0,expn)) then
    max(6,apply(max,map(ExpnType,[op(expn)])))
  elif op(0,expn)='int' then
    max(8,apply(max,map(ExpnType,[op(expn)]))) else
  9
  end if
end proc:


ElementaryFunctionQ := proc(func)
  member(func,[
        exp,log,ln,
        sin,cos,tan,cot,sec,csc,
```

```
        arcsin,arccos,arctan,arccot,arcsec,arccsc,
        sinh,cosh,tanh,coth,sech,csch,
        arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
end proc:

SpecialFunctionQ := proc(func)
  member(func,[
        erf,erfc,erfi,
        FresnelS,FresnelC,
        Ei,Ei,Li,Si,Ci,Shi,Chi,
        GAMMA,lnGAMMA,Psi,Zeta,polylog,dilog,LambertW,
        EllipticF,EllipticE,EllipticPi])
end proc:

HypergeometricFunctionQ := proc(func)
  member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
end proc:

AppellFunctionQ := proc(func)
  member(func,[AppellF1])
end proc:

# u is a sum or product.  rest(u) returns all but the
# first term or factor of u.
rest := proc(u) local v;
  if nops(u)=2 then
     op(2,u)
  else
     apply(op(0,u),op(2..nops(u),u))
  end if
end proc:

#leafcount(u) returns the number of nodes in u.
#Nasser 3/23/17  Replaced by build-in leafCount from package in Maple
leafcount := proc(u)
   MmaTranslator[Mma][LeafCount](u);
end proc:
```

4.2.3 Sympy grading function

```
#Dec 24, 2019. Nasser M. Abbasi:
#             Port of original Maple grading function by
#             Albert Rich to use with Sympy/Python
#Dec 27, 2019  Nasser. Added `RootSum`. See problem 177, Timofeev file
#             added 'exp_polar'
from sympy import *

def leaf_count(expr):
   #sympy do not have leaf count function. This is approximation
   return round(1.7*count_ops(expr))

def is_sqrt(expr):
   if isinstance(expr,Pow):
      if expr.args[1] == Rational(1,2):
         return True
      else:
         return False
   else:
      return False

def is_elementary_function(func):
   return func in [exp,log,ln,sin,cos,tan,cot,sec,csc,
         asin,acos,atan,acot,asec,acsc,sinh,cosh,tanh,coth,sech,csch,
         asinh,acosh,atanh,acoth,asech,acsch
      ]

def is_special_function(func):
   return func in [ erf,erfc,erfi,
          fresnels,fresnelc,Ei,Ei,Li,Si,Ci,Shi,Chi,
          gamma,loggamma,digamma,zeta,polylog,LambertW,
          elliptic_f,elliptic_e,elliptic_pi,exp_polar
       ]

def is_hypergeometric_function(func):
   return func in [hyper]

def is_appell_function(func):
   return func in [appellf1]

def is_atom(expn):
   try:
      if expn.isAtom or isinstance(expn,int) or isinstance(expn,float):
        return True
      else:
        return False
```

```
    except AttributeError as error:
        return False

def expnType(expn):
    debug=False
    if debug:
        print("expn=",expn,"type(expn)=",type(expn))

    if is_atom(expn):
       return 1
    elif isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
            return 1
        else:
            return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
    elif isinstance(expn,Pow):   #type(expn,'`^`')
        if isinstance(expn.args[1],Integer):  #type(op(2,expn),'integer')
            return expnType(expn.args[0])   #ExpnType(op(1,expn))
        elif isinstance(expn.args[1],Rational):  #type(op(2,expn),'rational')
            if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
                return 1
            else:
                return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
        else:
            return max(3,expnType(expn.args[0]),expnType(expn.args[1])) #max(3,ExpnType(op(1,expn)),ExpnT
    elif isinstance(expn,Add) or isinstance(expn,Mul): #type(expn,'`+`') or type(expn,'`*`')
        m1 = expnType(expn.args[0])
        m2 = expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.func):  #ElementaryFunctionQ(op(0,expn))
        return max(3,expnType(expn.args[0]))  #max(3,ExpnType(op(1,expn)))
    elif is_special_function(expn.func): #SpecialFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(4,m1)   #max(4,apply(max,map(ExpnType,[op(expn)])))
    elif is_hypergeometric_function(expn.func): #HypergeometricFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(5,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif is_appell_function(expn.func):
        m1 = max(map(expnType, list(expn.args)))
        return max(6,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif isinstance(expn,RootSum):
        m1 = max(map(expnType, list(expn.args))) #Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
        return max(7,m1)
    elif str(expn).find("Integral") != -1:
```

```
        m1 = max(map(expnType, list(expn.args)))
        return max(8,m1)    #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):

    #print ("Enter grade_antiderivative for sagemath")
    #print("Enter grade_antiderivative, result=",result," optimal=",optimal)

    leaf_count_result  = leaf_count(result)
    leaf_count_optimal = leaf_count(optimal)

    #print("leaf_count_result=",leaf_count_result)
    #print("leaf_count_optimal=",leaf_count_optimal)

    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if str(result).find("Integral") != -1:
        grade = "F"
        grade_annotation =""
    else:
        if expnType_result <= expnType_optimal:
            if result.has(I):
                if optimal.has(I): #both result and optimal complex
                    if leaf_count_result <= 2*leaf_count_optimal:
                        grade = "A"
                        grade_annotation =""
                    else:
                        grade = "B"
                        grade_annotation ="Both result and optimal contain complex but leaf count of result is larger
                else: #result contains complex but optimal is not
                    grade = "C"
                    grade_annotation ="Result contains complex when optimal does not."
            else: # result do not contain complex, this assumes optimal do not as well
                if leaf_count_result <= 2*leaf_count_optimal:
                    grade = "A"
                    grade_annotation =""
                else:
                    grade = "B"
                    grade_annotation ="Leaf count of result is larger than twice the leaf count of optimal. "+str(lea
        else:
            grade = "C"
            grade_annotation ="Result contains higher order function than in optimal. Order "+str(ExpnType_re
```

```
    #print("Before returning. grade=",grade, " grade_annotation=",grade_annotation)

    return grade, grade_annotation
```

4.2.4 SageMath grading function

```
#Dec 24, 2019. Nasser: Ported original Maple grading function by
#          Albert Rich to use with Sagemath. This is used to
#          grade Fricas, Giac and Maxima results.
#Dec 24, 2019. Nasser: Added 'exp_integral_e' and 'sng', 'sin_integral'
#          'arctan2','floor','abs','log_integral'
#June 4, 2022  Made default grade_annotation "none" instead of "" due
#          issue later when reading the file.
#July 14, 2022. Added ellipticF. This is until they fix sagemath, then remove it.

from sage.all import *
from sage.symbolic.operators import add_vararg, mul_vararg

debug=False;

def tree_size(expr):
    r"""
    Return the tree size of this expression.
    """
    #print("Enter tree_size, expr is ",expr)

    if expr not in SR:
        # deal with lists, tuples, vectors
        return 1 + sum(tree_size(a) for a in expr)
    expr = SR(expr)
    x, aa = expr.operator(), expr.operands()
    if x is None:
        return 1
    else:
        return 1 + sum(tree_size(a) for a in aa)

def is_sqrt(expr):
    if expr.operator() == operator.pow:   #isinstance(expr,Pow):
        if expr.operands()[1]==1/2: #expr.args[1] == Rational(1,2):
            if debug: print ("expr is sqrt")
            return True
        else:
            return False
    else:
        return False
```

```
def is_elementary_function(func):
    #debug=False
    m = func.name() in ['exp','log','ln',
            'sin','cos','tan','cot','sec','csc',
            'arcsin','arccos','arctan','arccot','arcsec','arccsc',
            'sinh','cosh','tanh','coth','sech','csch',
            'arcsinh','arccosh','arctanh','arccoth','arcsech','arccsch','sgn',
        'arctan2','floor','abs'
        ]
    if debug:
        if m:
            print ("func ", func , " is elementary_function")
        else:
            print ("func ", func , " is NOT elementary_function")


    return m

def is_special_function(func):
    #debug=False
    if debug:
        print ("type(func)=", type(func))

    m= func.name() in ['erf','erfc','erfi','fresnel_sin','fresnel_cos','Ei',
          'Ei','Li','Si','sin_integral','Ci','cos_integral','Shi','sinh_integral'
          'Chi','cosh_integral','gamma','log_gamma','psi,zeta',
          'polylog','lambert_w','elliptic_f','elliptic_e','ellipticF',
          'elliptic_pi','exp_integral_e','log_integral']

    if debug:
        print ("m=",m)
        if m:
            print ("func ", func ," is special_function")
        else:
            print ("func ", func ," is NOT special_function")


    return m


def is_hypergeometric_function(func):
    return func.name() in ['hypergeometric','hypergeometric_M','hypergeometric_U']

def is_appell_function(func):
    return func.name() in ['hypergeometric']    #[appellf1] can't find this in sagemath
```

```
def is_atom(expn):

   #debug=False
   if debug:
       print ("Enter is_atom, expn=",expn)

   if not hasattr(expn, 'parent'):
      return False


   #thanks to answer at https://ask.sagemath.org/question/49179/what-is-sagemath-equivalent-to-atomic-
   try:
      if expn.parent() is SR:
         return expn.operator() is None
      if expn.parent() in (ZZ, QQ, AA, QQbar):
         return expn in expn.parent() # Should always return True
      if hasattr(expn.parent(),"base_ring") and hasattr(expn.parent(),"gens"):
         return expn in expn.parent().base_ring() or expn in expn.parent().gens()

      return False

   except AttributeError as error:
      print("Exception,AttributeError in  is_atom")
      print ("cought exception" , type(error).__name__ )
      return False


def expnType(expn):

   if debug:
      print (">>>>>Enter expnType, expn=", expn)
      print (">>>>>is_atom(expn)=", is_atom(expn))

   if is_atom(expn):
      return 1
   elif type(expn)==list:   #isinstance(expn,list):
      return max(map(expnType, expn))    #apply(max,map(ExpnType,expn))
   elif  is_sqrt(expn):
      if  type(expn.operands()[0])==Rational:  #type(isinstance(expn.args[0],Rational):
         return 1
      else:
         return max(2,expnType(expn.operands()[0]))   #max(2,expnType(expn.args[0]))
   elif expn.operator() == operator.pow:    #isinstance(expn,Pow)
      if type(expn.operands()[1])==Integer:   #isinstance(expn.args[1],Integer)
         return expnType(expn.operands()[0])    #expnType(expn.args[0])
      elif type(expn.operands()[1])==Rational:   #isinstance(expn.args[1],Rational)
         if type(expn.operands()[0])==Rational:  #isinstance(expn.args[0],Rational)
```

```
            return 1
        else:
            return max(2,expnType(expn.operands()[0]))  #max(2,expnType(expn.args[0]))
    else:
        return max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1])) #max(3,expnType(expn.op
elif expn.operator() == add_vararg or expn.operator() == mul_vararg: #isinstance(expn,Add) or isinstan
    m1 = expnType(expn.operands()[0]) #expnType(expn.args[0])
    m2 = expnType(expn.operands()[1:]) #expnType(list(expn.args[1:]))
    return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
elif is_elementary_function(expn.operator()):  #is_elementary_function(expn.func)
    return max(3,expnType(expn.operands()[0]))
elif is_special_function(expn.operator()): #is_special_function(expn.func)
    m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(expn.args)))
    return max(4,m1)   #max(4,m1)
elif is_hypergeometric_function(expn.operator()): #is_hypergeometric_function(expn.func)
    m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(expn.args)))
    return max(5,m1)   #max(5,m1)
elif is_appell_function(expn.operator()):
    m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(expn.args)))
    return max(6,m1)   #max(6,m1)
elif str(expn).find("Integral") != -1: #this will never happen, since it
        #is checked before calling the grading function that is passed.
        #but kept it here.
    m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(expn.args)))
    return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
else:
    return 9

#main function
def grade_antiderivative(result,optimal):


    if debug:
        print ("Enter grade_antiderivative for sagemath")
        print("Enter grade_antiderivative, result=",result)
        print("Enter grade_antiderivative, optimal=",optimal)
        print("type(anti)=",type(result))
        print("type(optimal)=",type(optimal))

    leaf_count_result  = tree_size(result) #leaf_count(result)
    leaf_count_optimal = tree_size(optimal) #leaf_count(optimal)

    #if debug: print ("leaf_count_result=", leaf_count_result, "leaf_count_optimal=",leaf_count_optimal)


    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)
```

```
if debug: print ("expnType_result=", expnType_result, "expnType_optimal=",expnType_optimal)

if expnType_result <= expnType_optimal:
   if result.has(I):
      if optimal.has(I): #both result and optimal complex
         if leaf_count_result <= 2*leaf_count_optimal:
            grade = "A"
            grade_annotation ="none"
         else:
            grade = "B"
            grade_annotation ="Both result and optimal contain complex but leaf count of result is larger t
      else: #result contains complex but optimal is not
         grade = "C"
         grade_annotation ="Result contains complex when optimal does not."
   else: # result do not contain complex, this assumes optimal do not as well
      if leaf_count_result <= 2*leaf_count_optimal:
         grade = "A"
         grade_annotation ="none"
      else:
         grade = "B"
         grade_annotation ="Leaf count of result is larger than twice the leaf count of optimal. "+str(leaf_
else:
   grade = "C"
   grade_annotation ="Result contains higher order function than in optimal. Order "+str(expnType_resu


print("Before returning. grade=",grade, " grade_annotation=",grade_annotation)

return grade, grade_annotation
```