Computer algebra independent integration tests

`2_Exponentials/2.2-c+d_x-^m-F^-g-e+f_x-^n-a+b-F^-g-e+f_x-^n-^p`

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Contents

1 Introduction

This report gives the result of running the computer algebra independent integration problems. The listing of the problems are maintained by and can be downloaded from Albert Rich Rubi web site.

1.1 Listing of CAS systems tested

The following systems were tested at this time.

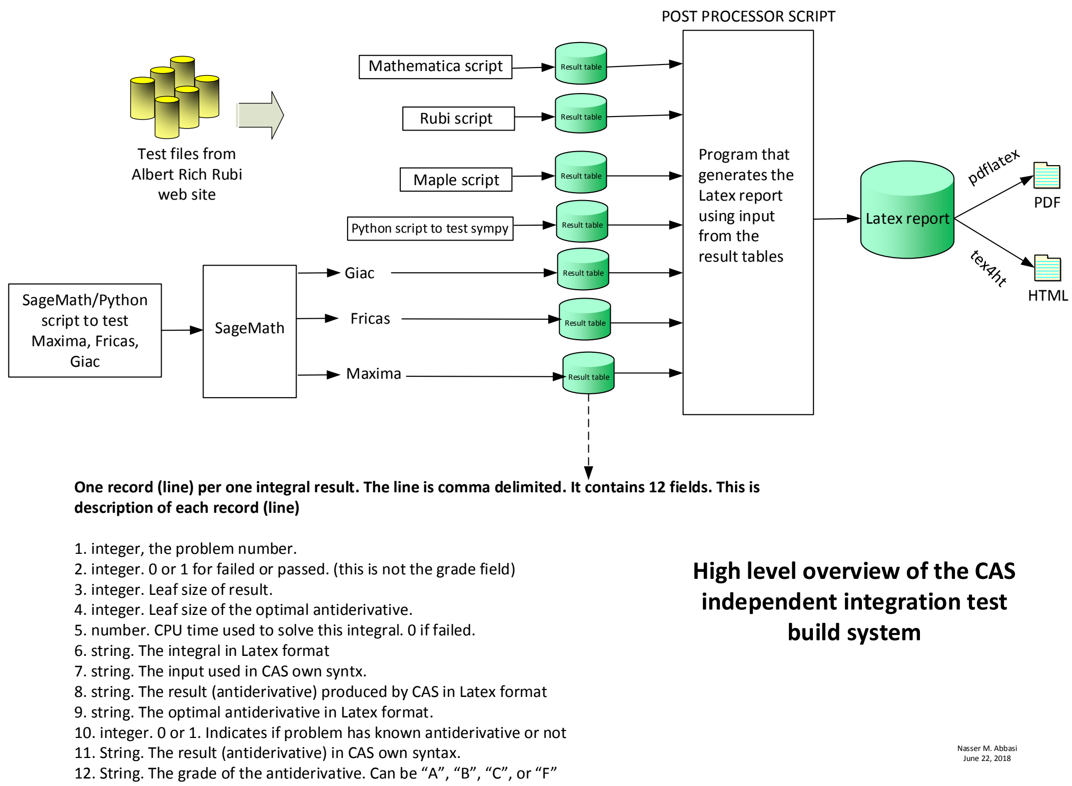
1. Mathematica 11.3 (64 bit).
2. Rubi 4.15.2 in Mathematica 11.3.
3. Rubi in Sympy (Version 1.3) under Python 3.7.0 using Anaconda distribution.
4. Maple 2018.1 (64 bit).
5. Maxima 5.41 Using Lisp ECL 16.1.2.
6. Fricas 1.3.4.
7. Sympy 1.3 under Python 3.7.0 using Anaconda distribution.
8. Giac/Xcas 1.4.9.

Maxima, Fricas and Giac/Xcas were called from inside SageMath version 8.3. This was done using SageMath integrate command by changing the name of the algorithm to use the different CAS systems.

Sympy was called directly using Python. Rubi in Sympy was also called directly using sympy 1.3 in python.

1.2 Design of the test system

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



1.3 Timing

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

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

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

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

1.4 Verification

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

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

1.5 Important notes about some of the results

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

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

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

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

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

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

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

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

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

Important note about FriCAS and Giac/XCAS results There are Few integrals which failed due to SageMath not able to translate the result back to SageMath syntax and not because these CAS system were not able to do the integrations.

These will fail With error `Exception raised: NotImplementedError`

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

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

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

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

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

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

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

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

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

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

  except Exception as ee:
         leafCount =1
```

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

1.6 Grading of results

The table below summarizes the grading of each CAS system.

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

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

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

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

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

System	solved	Failed
Rubi	% 100. (93)	% 0. (0)
Rubi in Sympy	% 77.42 (72)	% 22.58 (21)
Mathematica	% 87.1 (81)	% 12.9 (12)
Maple	% 80.65 (75)	% 19.35 (18)
Maxima	% 66.67 (62)	% 33.33 (31)
Fricas	% 100. (93)	% 0. (0)
Sympy	% 49.46 (46)	% 50.54 (47)
Giac	% 54.84 (51)	% 45.16 (42)

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

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

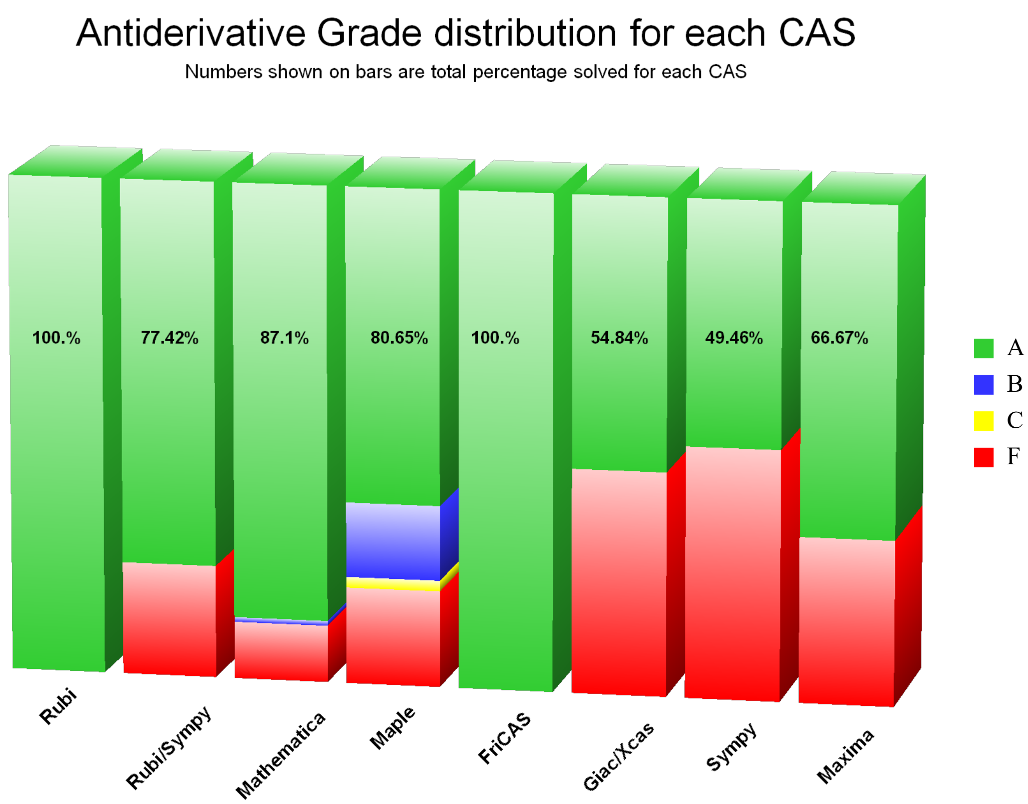
Grading is currently implemented only for for Mathematica, Rubi and Maple results. For all other CAS systems (Maxima, Fricas, Sympy, Giac, Rubi in sympy), the grading function is not yet implemented.

For these systems, a grade of A is assigned if the integrate command completes successfully and a grade of F otherwise.

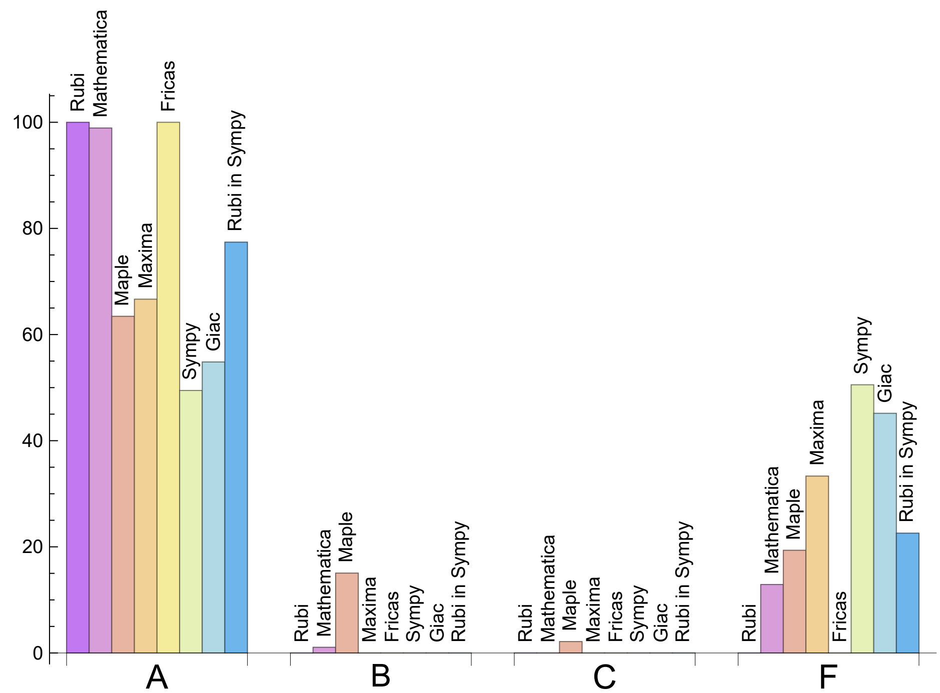
Based on the above, the following table summarizes the grading for this test suite.

System	% A grade	% B grade	% C grade	% F grade
Rubi	100.	0.	0.	0.
Rubi in Sympy	77.42	0.	0.	22.58
Mathematica	98.92	1.08	0.	12.9
Maple	63.44	15.05	2.15	19.35
Maxima	66.67	0.	0.	33.33
Fricas	100.	0.	0.	0.
Sympy	49.46	0.	0.	50.54
Giac	54.84	0.	0.	45.16

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



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



1.7 Performance

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

System	Mean time (sec)	Mean size	Normalized mean	Median size	Normalized median
Rubi	0.39	121.83	0.74	84.	1.
Rubi in Sympy	27.47	100.67	0.78	76.5	0.89
Mathematica	0.4	82.12	0.63	62.	0.72
Maple	0.06	274.24	1.53	77.	1.2
Maxima	0.5	90.97	0.92	67.	1.24
Fricas	0.2	285.59	1.47	135.	1.45
Sympy	0.77	125.3	0.86	40.5	0.87
Giac	0.16	71.84	0.99	1.	0.

1.8 list of integrals that has no closed form antiderivative

{5, 6, 13, 14, 21, 22, 50, 51, 56, 57, 62, 63, 67, 68, 69, 73, 74, 75, 80, 81, 86, 87, 92, 93}

1.9 list of integrals not solved by each system

Not solved by Rubi {}

Not solved by Rubi in Sympy {9, 10, 11, 17, 18, 19, 28, 35, 42, 50, 51, 52, 53, 54, 58, 59, 60, 68, 69, 88, 89}

Not solved by Mathematica {46, 47, 48, 52, 53, 54, 58, 59, 60, 70, 71, 72}

Not solved by Maple {25, 29, 30, 31, 32, 33, 36, 37, 38, 39, 40, 41, 43, 44, 45, 70, 71, 72}

Not solved by Maxima {25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 47, 48, 52, 53, 54, 58, 59, 60, 70, 71, 72}

Not solved by Fricas {}

Not solved by Sympy {1, 2, 3, 9, 10, 11, 17, 18, 19, 29, 30, 31, 36, 37, 38, 43, 44, 45, 46, 47, 48, 50, 51, 52, 53, 54, 56, 57, 58, 59, 60, 62, 63, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 82, 83, 88, 89}

Not solved by Giac {1, 2, 3, 9, 10, 11, 17, 18, 19, 29, 30, 31, 36, 37, 38, 43, 44, 45, 46, 47, 48, 49, 52, 53, 54, 55, 58, 59, 60, 61, 70, 71, 72, 76, 77, 78, 82, 83, 84, 88, 89, 90}

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

Rubi {}

Rubi in Sympy {}

Mathematica {}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

1.11 list of integrals solved by CAS but failed verification

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

Rubi {}

Mathematica {}

Maple Verification phase not implemented yet.

Maxima Verification phase not implemented yet.

Fricas Verification phase not implemented yet.

Sympy Verification phase not implemented yet.

Giac Verification phase not implemented yet.

Rubi in Sympy Verification phase not implemented yet.

2 detailed summary tables of results

2.1 Detailed conclusion table per each integral for all CAS systems

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

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

Problem 1	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	110	191	127	162	0	0	92
normalized size	1	1.	1.	1.74	1.15	1.47	0.	0.	0.84
time (sec)	N/A	0.308	0.02	0.02	0.799	0.249	0.	0.	21.588

Problem 2	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	84	166	97	135	0	0	66
normalized size	1	1.	1.	1.98	1.15	1.61	0.	0.	0.79
time (sec)	N/A	0.263	0.016	0.007	0.812	0.266	0.	0.	18.233

Problem 3	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	58	133	65	97	0	0	39
normalized size	1	1.	1.	2.29	1.12	1.67	0.	0.	0.67
time (sec)	N/A	0.154	0.014	0.006	0.871	0.266	0.	0.	9.748

Problem 4	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	26	35	43	32	17	45	56
normalized size	1	1.	1.	1.35	1.65	1.23	0.65	1.73	2.15
time (sec)	N/A	0.036	0.007	0.001	0.781	0.248	0.235	0.265	8.032

Problem 5	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	20	0	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.074	0.104	0.017	0.	0.	0.	0.	0.

Problem 6	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	20	0	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.071	0.236	0.019	0.	0.	0.	0.	0.

Problem 7	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	21	37	46	31	17	47	53
normalized size	1	1.	0.81	1.42	1.77	1.19	0.65	1.81	2.04
time (sec)	N/A	0.041	0.013	0.004	0.786	0.259	0.249	0.245	9.025

Problem 8	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	19	41	46	34	19	47	60
normalized size	1	1.	0.68	1.46	1.64	1.21	0.68	1.68	2.14
time (sec)	N/A	0.044	0.013	0.004	0.757	0.258	0.254	0.286	8.758

Problem 9	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	F	F(-2)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	217	217	158	382	263	446	0	0	0
normalized size	1	1.	0.73	1.76	1.21	2.06	0.	0.	0.
time (sec)	N/A	0.79	0.278	0.072	0.797	0.261	0.	0.	0.

Problem 10	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	165	165	113	324	201	355	0	0	0
normalized size	1	1.	0.68	1.96	1.22	2.15	0.	0.	0.
time (sec)	N/A	0.633	0.327	0.062	0.803	0.255	0.	0.	0.

Problem 11	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	85	231	128	238	0	0	0
normalized size	1	1.	0.79	2.16	1.2	2.22	0.	0.	0.
time (sec)	N/A	0.324	0.154	0.041	0.792	0.255	0.	0.	0.

Problem 12	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	41	54	69	81	39	70	88
normalized size	1	1.	0.89	1.17	1.5	1.76	0.85	1.52	1.91
time (sec)	N/A	0.065	0.058	0.003	0.862	0.255	0.311	0.269	12.947

Problem 13	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	20	0	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.07	0.859	0.041	0.	0.	0.	0.	0.

Problem 14	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	20	0	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.066	0.749	0.051	0.	0.	0.	0.	0.

Problem 15	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	42	58	74	88	39	76	83
normalized size	1	1.	0.88	1.21	1.54	1.83	0.81	1.58	1.73
time (sec)	N/A	0.066	0.052	0.003	0.789	0.275	0.318	0.255	14.041

Problem 16	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	35	64	77	99	42	78	94
normalized size	1	1.	0.67	1.23	1.48	1.9	0.81	1.5	1.81
time (sec)	N/A	0.07	0.051	0.003	0.862	0.26	0.335	0.256	13.867

Problem 17	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	F	F(-2)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	333	333	241	548	409	948	0	0	0
normalized size	1	1.	0.72	1.65	1.23	2.85	0.	0.	0.
time (sec)	N/A	1.694	0.305	0.089	0.866	0.257	0.	0.	0.

Problem 18	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	243	243	203	385	316	703	0	0	0
normalized size	1	1.	0.84	1.58	1.3	2.89	0.	0.	0.
time (sec)	N/A	1.193	0.23	0.078	0.981	0.27	0.	0.	0.

Problem 19	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	159	159	120	393	201	456	0	0	0
normalized size	1	1.	0.75	2.47	1.26	2.87	0.	0.	0.
time (sec)	N/A	0.534	0.183	0.036	0.924	0.255	0.	0.	0.

Problem 20	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	69	74	113	171	76	93	122
normalized size	1	1.	1.	1.07	1.64	2.48	1.1	1.35	1.77
time (sec)	N/A	0.085	0.117	0.001	0.799	0.246	0.392	0.25	16.624

Problem 21	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	20	0	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.071	0.984	0.055	0.	0.	0.	0.	0.

Problem 22	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	20	0	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.069	0.841	0.085	0.	0.	0.	0.	0.

Problem 23	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	62	79	119	178	78	99	116
normalized size	1	1.	0.86	1.1	1.65	2.47	1.08	1.38	1.61
time (sec)	N/A	0.085	0.081	0.003	0.791	0.259	0.424	0.262	17.749

Problem 24	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	54	87	124	189	85	104	129
normalized size	1	1.	0.69	1.12	1.59	2.42	1.09	1.33	1.65
time (sec)	N/A	0.092	0.08	0.003	0.769	0.262	0.422	0.249	17.488

Problem 25	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	153	153	130	0	0	360	332	1	144
normalized size	1	1.	0.85	0.	0.	2.35	2.17	0.01	0.94
time (sec)	N/A	0.412	0.209	0.039	0.	0.262	0.656	0.318	45.59

Problem 26	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	91	199	0	224	196	1	105
normalized size	1	1.	0.79	1.73	0.	1.95	1.7	0.01	0.91
time (sec)	N/A	0.269	0.145	0.046	0.	0.262	0.514	0.277	28.909

Problem 27	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	73	105	0	117	94	1	65
normalized size	1	1.	0.95	1.36	0.	1.52	1.22	0.01	0.84
time (sec)	N/A	0.136	0.168	0.03	0.	0.28	0.398	0.275	13.937

Problem 28	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	31	0	50	32	43	0
normalized size	1	1.	1.	1.03	0.	1.67	1.07	1.43	0.
time (sec)	N/A	0.035	0.033	0.004	0.	0.26	0.232	0.265	0.

Problem 29	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	56	0	0	68	0	0	65
normalized size	1	1.	0.82	0.	0.	1.	0.	0.	0.96
time (sec)	N/A	0.226	0.099	0.07	0.	0.283	0.	0.	15.413

Problem 30	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	78	0	0	117	0	0	92
normalized size	1	1.	0.78	0.	0.	1.17	0.	0.	0.92
time (sec)	N/A	0.287	0.303	0.068	0.	0.278	0.	0.	21.44

Problem 31	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	147	147	111	0	0	216	0	0	138
normalized size	1	1.	0.76	0.	0.	1.47	0.	0.	0.94
time (sec)	N/A	0.397	0.299	0.032	0.	0.279	0.	0.	33.072

Problem 32	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	322	322	239	0	0	651	709	1	309
normalized size	1	1.	0.74	0.	0.	2.02	2.2	0.	0.96
time (sec)	N/A	0.831	0.377	0.027	0.	0.267	1.158	0.446	109.006

Problem 33	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	239	239	171	0	0	387	439	1	221
normalized size	1	1.	0.72	0.	0.	1.62	1.84	0.	0.92
time (sec)	N/A	0.559	0.317	0.024	0.	0.292	0.91	0.405	70.021

Problem 34	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	117	220	0	188	233	1	138
normalized size	1	1.	0.75	1.41	0.	1.21	1.49	0.01	0.88
time (sec)	N/A	0.286	0.263	0.05	0.	0.284	0.682	0.355	36.249

Problem 35	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	52	90	101	82	94	914	0
normalized size	1	1.	0.78	1.34	1.51	1.22	1.4	13.64	0.
time (sec)	N/A	0.082	0.1	0.023	0.838	0.28	0.379	0.283	0.

Problem 36	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	134	108	0	0	128	0	0	138
normalized size	1	1.	0.81	0.	0.	0.96	0.	0.	1.03
time (sec)	N/A	0.438	0.269	0.079	0.	0.255	0.	0.	33.932

Problem 37	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	202	202	136	0	0	231	0	0	202
normalized size	1	1.	0.67	0.	0.	1.14	0.	0.	1.
time (sec)	N/A	0.588	0.813	0.032	0.	0.28	0.	0.	48.122

Problem 38	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	286	286	217	0	0	424	0	0	284
normalized size	1	1.	0.76	0.	0.	1.48	0.	0.	0.99
time (sec)	N/A	0.819	0.601	0.032	0.	0.282	0.	0.	78.454

Problem 39	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	496	496	341	0	0	956	1074	1	478
normalized size	1	1.	0.69	0.	0.	1.93	2.17	0.	0.96
time (sec)	N/A	1.238	0.582	0.032	0.	0.305	1.573	0.568	174.116

Problem 40	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	366	366	248	0	0	559	653	1	347
normalized size	1	1.	0.68	0.	0.	1.53	1.78	0.	0.95
time (sec)	N/A	0.812	0.486	0.03	0.	0.289	1.202	0.495	110.148

Problem 41	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	236	236	161	0	0	259	350	1	212
normalized size	1	1.	0.68	0.	0.	1.1	1.48	0.	0.9
time (sec)	N/A	0.408	0.382	0.018	0.	0.271	0.887	0.45	56.599

Problem 42	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	103	103	74	124	155	113	153	1393	0
normalized size	1	1.	0.72	1.2	1.5	1.1	1.49	13.52	0.
time (sec)	N/A	0.112	0.136	0.005	0.818	0.299	0.487	0.305	0.

Problem 43	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	200	200	160	0	0	189	0	0	211
normalized size	1	1.	0.8	0.	0.	0.94	0.	0.	1.05
time (sec)	N/A	0.592	0.485	0.034	0.	0.266	0.	0.	50.486

Problem 44	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	305	305	250	0	0	350	0	0	313
normalized size	1	1.	0.82	0.	0.	1.15	0.	0.	1.03
time (sec)	N/A	0.849	1.88	0.031	0.	0.284	0.	0.	73.323

Problem 45	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	447	447	325	0	0	641	0	0	457
normalized size	1	1.	0.73	0.	0.	1.43	0.	0.	1.02
time (sec)	N/A	1.194	0.983	0.033	0.	0.281	0.	0.	124.056

Problem 46	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	A	F(-1)	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	192	192	0	2495	0	558	0	0	160
normalized size	1	1.	0.	12.99	0.	2.91	0.	0.	0.83
time (sec)	N/A	0.548	2.844	0.083	0.	0.266	0.	0.	94.025

Problem 47	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	A	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	145	145	0	1341	0	366	0	0	114
normalized size	1	1.	0.	9.25	0.	2.52	0.	0.	0.79
time (sec)	N/A	0.464	2.661	0.089	0.	0.265	0.	0.	52.758

Problem 48	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	A	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	0	526	0	198	0	0	66
normalized size	1	1.	0.	5.37	0.	2.02	0.	0.	0.67
time (sec)	N/A	0.257	89.733	0.06	0.	0.266	0.	0.	26.609

Problem 49	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	100	65	89	59	27	0	46
normalized size	1	1.	2.5	1.62	2.22	1.48	0.68	0.	1.15
time (sec)	N/A	0.064	0.017	0.004	0.88	0.264	0.348	0.	13.08

Problem 50	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	N/A	A	A	A	A	A	F(-1)	A	F(-1)
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.205	0.118	0.116	0.	0.	0.	0.	0.

Problem 51	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	N/A	A	A	A	A	A	F(-1)	A	F(-1)
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.185	0.461	0.135	0.	0.	0.	0.	0.

Problem 52	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	A	F	F	F(-1)
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	388	388	0	2553	0	1877	0	0	0
normalized size	1	1.	0.	6.58	0.	4.84	0.	0.	0.
time (sec)	N/A	1.421	3.575	0.072	0.	0.292	0.	0.	0.

Problem 53	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	A	F	F	F(-1)
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	294	294	0	1251	0	1126	0	0	0
normalized size	1	1.	0.	4.26	0.	3.83	0.	0.	0.
time (sec)	N/A	1.118	3.27	0.05	0.	0.283	0.	0.	0.

Problem 54	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	A	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	191	191	0	437	0	540	0	0	0
normalized size	1	1.	0.	2.29	0.	2.83	0.	0.	0.
time (sec)	N/A	0.569	90.721	0.085	0.	0.267	0.	0.	0.

Problem 55	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	68	99	135	135	66	0	75
normalized size	1	1.	0.92	1.34	1.82	1.82	0.89	0.	1.01
time (sec)	N/A	0.108	0.192	0.003	0.773	0.276	0.428	0.	20.243

Problem 56	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.2	1.462	0.415	0.	0.	0.	0.	0.

Problem 57	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.185	1.51	0.219	0.	0.	0.	0.	0.

Problem 58	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	A	F	F	F(-1)
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	594	594	0	3116	0	3650	0	0	0
normalized size	1	1.	0.	5.25	0.	6.14	0.	0.	0.
time (sec)	N/A	3.152	4.084	0.079	0.	0.285	0.	0.	0.

Problem 59	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	A	F	F	F(-1)
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	439	439	0	1457	0	2049	0	0	0
normalized size	1	1.	0.	3.32	0.	4.67	0.	0.	0.
time (sec)	N/A	2.185	3.536	0.053	0.	0.27	0.	0.	0.

Problem 60	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	A	F	F	F(-1)
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	276	276	0	514	0	940	0	0	0
normalized size	1	1.	0.	1.86	0.	3.41	0.	0.	0.
time (sec)	N/A	0.954	90.36	0.039	0.	0.252	0.	0.	0.

Problem 61	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	97	134	196	257	116	0	105
normalized size	1	1.	0.87	1.21	1.77	2.32	1.05	0.	0.95
time (sec)	N/A	0.142	0.34	0.004	0.891	0.281	0.56	0.	24.563

Problem 62	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.198	2.743	0.227	0.	0.	0.	0.	0.

Problem 63	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.182	2.183	0.405	0.	0.	0.	0.	0.

Problem 64	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	106	77	111	101	76	93	61
normalized size	1	1.	1.49	1.08	1.56	1.42	1.07	1.31	0.86
time (sec)	N/A	0.151	0.594	0.008	0.807	0.294	4.425	0.321	12.45

Problem 65	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	145	145	197	144	216	182	167	182	133
normalized size	1	1.	1.36	0.99	1.49	1.26	1.15	1.26	0.92
time (sec)	N/A	0.332	0.766	0.006	0.853	0.255	6.622	0.264	25.878

Problem 66	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	224	224	285	211	321	267	265	271	212
normalized size	1	1.	1.27	0.94	1.43	1.19	1.18	1.21	0.95
time (sec)	N/A	0.449	1.086	0.007	0.878	0.257	9.355	0.24	37.185

Problem 67	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.063	0.352	0.038	0.	0.	0.	0.	0.

Problem 68	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	N/A	A	A	A	A	A	A	A	F(-1)
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.06	0.785	0.062	0.	0.	0.	0.	0.

Problem 69	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	N/A	A	A	A	A	A	F(-1)	A	F(-1)
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.059	1.061	0.075	0.	0.	0.	0.	0.

Problem 70	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	340	340	0	0	0	365	0	0	333
normalized size	1	1.	0.	0.	0.	1.07	0.	0.	0.98
time (sec)	N/A	0.833	0.258	0.064	0.	0.28	0.	0.	77.94

Problem 71	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	228	228	0	0	0	258	0	0	219
normalized size	1	1.	0.	0.	0.	1.13	0.	0.	0.96
time (sec)	N/A	0.499	0.2	0.051	0.	0.276	0.	0.	50.253

Problem 72	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	0	0	0	150	0	0	105
normalized size	1	1.	0.	0.	0.	1.29	0.	0.	0.91
time (sec)	N/A	0.239	0.145	0.052	0.	0.271	0.	0.	22.981

Problem 73	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.181	0.11	0.08	0.	0.	0.	0.	0.

Problem 74	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.173	0.148	0.333	0.	0.	0.	0.	0.

Problem 75	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.172	0.354	0.246	0.	0.	0.	0.	0.

Problem 76	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	103	217	180	181	0	0	104
normalized size	1	1.	0.9	1.89	1.57	1.57	0.	0.	0.9
time (sec)	N/A	0.217	0.051	0.04	0.816	0.301	0.	0.	32.533

Problem 77	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	76	187	144	146	0	0	75
normalized size	1	1.	0.89	2.2	1.69	1.72	0.	0.	0.88
time (sec)	N/A	0.18	0.027	0.026	0.827	0.287	0.	0.	27.057

Problem 78	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	47	148	107	101	0	0	44
normalized size	1	1.	0.87	2.74	1.98	1.87	0.	0.	0.81
time (sec)	N/A	0.105	0.023	0.023	0.797	0.272	0.	0.	18.6

Problem 79	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	23	24	31	31	17	32	17
normalized size	1	1.	1.	1.04	1.35	1.35	0.74	1.39	0.74
time (sec)	N/A	0.058	0.005	0.003	0.789	0.251	0.285	0.252	13.455

Problem 80	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.103	0.053	0.037	0.	0.	0.	0.	0.

Problem 81	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.1	0.055	0.036	0.	0.	0.	0.	0.

Problem 82	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	140	140	137	267	181	332	0	0	110
normalized size	1	1.	0.98	1.91	1.29	2.37	0.	0.	0.79
time (sec)	N/A	0.396	0.168	0.032	0.811	0.24	0.	0.	39.027

Problem 83	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	103	225	143	251	0	0	78
normalized size	1	1.	0.96	2.1	1.34	2.35	0.	0.	0.73
time (sec)	N/A	0.286	0.115	0.028	0.803	0.255	0.	0.	29.054

Problem 84	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	54	67	97	100	58	0	92
normalized size	1	1.	0.78	0.97	1.41	1.45	0.84	0.	1.33
time (sec)	N/A	0.127	0.079	0.019	0.851	0.246	0.403	0.	22.489

Problem 85	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	25	26	34	34	26	34	19
normalized size	1	1.	1.	1.04	1.36	1.36	1.04	1.36	0.76
time (sec)	N/A	0.057	0.02	0.003	0.777	0.256	0.268	0.227	7.625

Problem 86	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	61	0	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.183	0.144	0.036	0.	0.	0.	0.	0.

Problem 87	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	61	0	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.181	0.153	0.048	0.	0.	0.	0.	0.

Problem 88	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	261	261	220	488	355	779	0	0	0
normalized size	1	1.	0.84	1.87	1.36	2.98	0.	0.	0.
time (sec)	N/A	0.804	0.458	0.053	0.813	0.273	0.	0.	0.

Problem 89	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	182	182	177	295	289	512	0	0	0
normalized size	1	1.	0.97	1.62	1.59	2.81	0.	0.	0.
time (sec)	N/A	0.486	0.215	0.04	0.799	0.267	0.	0.	0.

Problem 90	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	106	106	98	127	203	200	122	0	141
normalized size	1	1.	0.92	1.2	1.92	1.89	1.15	0.	1.33
time (sec)	N/A	0.162	0.097	0.026	0.813	0.265	0.517	0.	30.51

Problem 91	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	26	34	62	53	34	22
normalized size	1	1.	1.	0.96	1.26	2.3	1.96	1.26	0.81
time (sec)	N/A	0.058	0.017	0.003	0.771	0.255	0.299	0.24	8.529

Problem 92	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	65	0	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.183	0.832	0.091	0.	0.	0.	0.	0.

Problem 93	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	63	0	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.179	0.908	0.119	0.	0.	0.	0.	0.

2.2 Detailed conclusion table specific for Rubi results

The following table is specific to Rubi. It gives additional statistics for each integral. the column **steps** is the number of steps used by Rubi to obtain the antiderivative. The **rules** column is the number of unique rules used. The **integrand size** column is the leaf size of the integrand. Finally the ratio $\frac{\text{number of rules}}{\text{integrand size}}$ is given. The larger this ratio is, the harder the integral was to solve. In this test, problem number [19] had the largest ratio of [0.7333]

Table 1: Rubi specific breakdown of results for each integral

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1	A	6	6	1.	17	0.353
2	A	5	5	1.	17	0.294
3	A	4	4	1.	15	0.267
4	A	4	4	1.	13	0.308
5	A	0	0	0.	0	0.
6	A	0	0	0.	0	0.
7	A	4	4	1.	14	0.286
8	A	4	4	1.	16	0.25
9	A	13	8	1.	17	0.471
10	A	11	9	1.	17	0.529
11	A	10	10	1.	15	0.667
12	A	3	2	1.	13	0.154
13	A	0	0	0.	0	0.
14	A	0	0	0.	0	0.
15	A	3	2	1.	14	0.143
16	A	3	2	1.	16	0.125
17	A	26	10	1.	17	0.588
18	A	23	12	1.	17	0.706
19	A	15	11	1.	15	0.733
20	A	3	2	1.	13	0.154
21	A	0	0	0.	0	0.
22	A	0	0	0.	0	0.
23	A	3	2	1.	14	0.143
24	A	3	2	1.	16	0.125
25	A	6	3	1.	23	0.13
26	A	5	3	1.	23	0.13
27	A	4	3	1.	21	0.143
28	A	2	1	1.	15	0.067
29	A	4	3	1.	23	0.13
30	A	5	4	1.	23	0.174
31	A	6	4	1.	23	0.174
32	A	10	3	1.	25	0.12
33	A	8	3	1.	25	0.12

Continued on next page

Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
34	A	6	3	1.	23	0.13
35	A	4	3	1.	17	0.176
36	A	6	3	1.	25	0.12
37	A	8	4	1.	25	0.16
38	A	10	4	1.	25	0.16
39	A	14	3	1.	25	0.12
40	A	11	3	1.	25	0.12
41	A	8	3	1.	23	0.13
42	A	4	3	1.	17	0.176
43	A	8	3	1.	25	0.12
44	A	11	4	1.	25	0.16
45	A	14	4	1.	25	0.16
46	A	6	6	1.	25	0.24
47	A	5	5	1.	25	0.2
48	A	4	4	1.	23	0.174
49	A	5	5	1.	17	0.294
50	A	0	0	0.	0	0.
51	A	0	0	0.	0	0.
52	A	13	8	1.	25	0.32
53	A	11	9	1.	25	0.36
54	A	11	11	1.	23	0.478
55	A	4	3	1.	17	0.176
56	A	0	0	0.	0	0.
57	A	0	0	0.	0	0.
58	A	26	10	1.	25	0.4
59	A	24	13	1.	25	0.52
60	A	17	12	1.	23	0.522
61	A	4	3	1.	17	0.176
62	A	0	0	0.	0	0.
63	A	0	0	0.	0	0.
64	A	5	4	1.	17	0.235
65	A	8	4	1.	19	0.21
66	A	11	4	1.	19	0.21
67	A	0	0	0.	0	0.

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
68	A	0	0	0.	0	0.
69	A	0	0	0.	0	0.
70	A	8	3	1.	25	0.12
71	A	6	3	1.	25	0.12
72	A	4	3	1.	23	0.13
73	A	0	0	0.	0	0.
74	A	0	0	0.	0	0.
75	A	0	0	0.	0	0.
76	A	5	5	1.	24	0.208
77	A	4	4	1.	24	0.167
78	A	3	3	1.	22	0.136
79	A	2	2	1.	21	0.095
80	A	0	0	0.	0	0.
81	A	0	0	0.	0	0.
82	A	6	6	1.	24	0.25
83	A	5	5	1.	24	0.208
84	A	5	5	1.	22	0.227
85	A	2	2	1.	21	0.095
86	A	0	0	0.	0	0.
87	A	0	0	0.	0	0.
88	A	12	9	1.	24	0.375
89	A	11	10	1.	24	0.417
90	A	4	3	1.	22	0.136
91	A	2	2	1.	21	0.095
92	A	0	0	0.	0	0.
93	A	0	0	0.	0	0.

3 Listing of integrals

3.1 $\int \frac{x^3}{a+be^{c+dx}}\,dx$

Optimal. Leaf size=110

$$-\frac{6\text{PolyLog}\left(4,-\frac{be^{c+dx}}{a}\right)}{ad^4}+\frac{6x\text{PolyLog}\left(3,-\frac{be^{c+dx}}{a}\right)}{ad^3}-\frac{3x^2\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{ad^2}-\frac{x^3\log\left(\frac{be^{c+dx}}{a}+1\right)}{ad}+\frac{x^4}{4a}$$

```
[Out] x^4/(4*a) - (x^3*Log[1 + (b*E^(c + d*x))/a])/(a*d) - (3*x^2*PolyL
og[2, -((b*E^(c + d*x))/a)])/(a*d^2) + (6*x*PolyLog[3, -((b*E^(c
+ d*x))/a)])/(a*d^3) - (6*PolyLog[4, -((b*E^(c + d*x))/a)])/(a*d^
4)
```

Rubi [A] time = 0.307828, antiderivative size = 110, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.353

$$-\frac{6\text{PolyLog}\left(4,-\frac{be^{c+dx}}{a}\right)}{ad^4}+\frac{6x\text{PolyLog}\left(3,-\frac{be^{c+dx}}{a}\right)}{ad^3}-\frac{3x^2\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{ad^2}-\frac{x^3\log\left(\frac{be^{c+dx}}{a}+1\right)}{ad}+\frac{x^4}{4a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b*E^(c + d*x)),x]
```

```
[Out] x^4/(4*a) - (x^3*Log[1 + (b*E^(c + d*x))/a])/(a*d) - (3*x^2*PolyL
og[2, -((b*E^(c + d*x))/a)])/(a*d^2) + (6*x*PolyLog[3, -((b*E^(c
+ d*x))/a)])/(a*d^3) - (6*PolyLog[4, -((b*E^(c + d*x))/a)])/(a*d^
4)
```

Rubi in Sympy [A] time = 21.5877, size = 92, normalized size = 0.84

$$-\frac{x^3\log\left(\frac{ae^{-c-dx}}{b}+1\right)}{ad}+\frac{3x^2\operatorname{Li}_2\left(-\frac{ae^{-c-dx}}{b}\right)}{ad^2}+\frac{6x\operatorname{Li}_3\left(-\frac{ae^{-c-dx}}{b}\right)}{ad^3}+\frac{6\operatorname{Li}_4\left(-\frac{ae^{-c-dx}}{b}\right)}{ad^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b*exp(d*x+c)),x)
```

```
[Out] -x**3*log(a*exp(-c - d*x)/b + 1)/(a*d) + 3*x**2*polylog(2, -a*exp
(-c - d*x)/b)/(a*d**2) + 6*x*polylog(3, -a*exp(-c - d*x)/b)/(a*d*
```

```
*3) + 6*polylog(4, -a*exp(-c - d*x)/b)/(a*d**4)
```

Mathematica [A] time = 0.0195039, size = 110, normalized size = 1.

$$-\frac{6\text{PolyLog}\left(4,-\frac{be^{c+dx}}{a}\right)}{ad^4}+\frac{6x\text{PolyLog}\left(3,-\frac{be^{c+dx}}{a}\right)}{ad^3}-\frac{3x^2\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{ad^2}-\frac{x^3\log\left(\frac{be^{c+dx}}{a}+1\right)}{ad}+\frac{x^4}{4a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + b*E^(c + d*x)),x]
```

```
[Out] x^4/(4*a) - (x^3*Log[1 + (b*E^(c + d*x))/a])/(a*d) - (3*x^2*PolyL
og[2, -((b*E^(c + d*x))/a)])/(a*d^2) + (6*x*PolyLog[3, -((b*E^(c
+ d*x))/a)])/(a*d^3) - (6*PolyLog[4, -((b*E^(c + d*x))/a)])/(a*d^
4)
```

Maple [A] time = 0.02, size = 191, normalized size = 1.7

$$\frac{x^4}{4\,a}+\frac{xc^3}{d^3a}+\frac{3\,c^4}{4\,d^4a}-\frac{x^3}{ad}\ln\left(1+\frac{be^{dx+c}}{a}\right)-\frac{c^3}{d^4a}\ln\left(1+\frac{be^{dx+c}}{a}\right)-3\,\frac{x^2}{ad^2}\mathit{polylog}\left(2,-\frac{be^{dx+c}}{a}\right)+6\,\frac{x}{d^3a}\mathit{polylog}\left(3,-\frac{be^{dx+c}}{a}\right)-6\,\frac{1}{d^4a}\mathit{polylog}\left(4,-\frac{be^{dx+c}}{a}\right)-\frac{c^3\ln\left(e^{dx+c}\right)}{d^4a}+\frac{c^3\ln\left(a+be^{dx+c}\right)}{d^4a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(a+b*exp(d*x+c)),x)
```

```
[Out] 1/4*x^4/a+1/d^3/a*x*c^3+3/4/d^4/a*c^4-x^3*ln(1+b*exp(d*x+c)/a)/a/
d-1/d^4/a*ln(1+b*exp(d*x+c)/a)*c^3-3*x^2*polylog(2,-b*exp(d*x+c)/
a)/a/d^2+6*x*polylog(3,-b*exp(d*x+c)/a)/a/d^3-6*polylog(4,-b*exp(
d*x+c)/a)/a/d^4-1/d^4*c^3/a*ln(exp(d*x+c))+1/d^4*c^3/a*ln(a+b*exp
(d*x+c))
```

Maxima [A] time = 0.799311, size = 127, normalized size = 1.15

$$\frac{x^4}{4\,a}-\frac{d^3x^3\log\left(\frac{be^{(dx+c)}}{a}+1\right)+3\,d^2x^2\text{Li}_2\left(-\frac{be^{(dx+c)}}{a}\right)-6\,dx\text{Li}_3(-\frac{be^{(dx+c)}}{a})+6\,\text{Li}_4(-\frac{be^{(dx+c)}}{a})}{ad^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*x^4/a - (d^3*x^3*log(b*e^(d*x + c)/a + 1) + 3*d^2*x^2*dilog(-
b*e^(d*x + c)/a) - 6*d*x*polylog(3, -b*e^(d*x + c)/a) + 6*polylog
(4, -b*e^(d*x + c)/a))/(a*d^4)
```

Fricas [A] time = 0.249467, size = 162, normalized size = 1.47

$$\frac{d^4x^4 - 12\,d^2x^2\mathrm{Li}_2\left(-\frac{be^{(dx+c)}+a}{a}+1\right) + 4\,c^3\log\left(be^{(dx+c)}+a\right) + 24\,dx\mathrm{Li}_3(-\frac{be^{(dx+c)}}{a}) - 4\left(d^3x^3+c^3\right)\log\left(\frac{be^{(dx+c)}+a}{a}\right) - 24\,\mathrm{Li}_4(}{4\,ad^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*(d^4*x^4 - 12*d^2*x^2*dilog(-(b*e^(d*x + c) + a)/a + 1) + 4*c
^3*log(b*e^(d*x + c) + a) + 24*d*x*polylog(3, -b*e^(d*x + c)/a) -
 4*(d^3*x^3 + c^3)*log((b*e^(d*x + c) + a)/a) - 24*polylog(4, -b*
e^(d*x + c)/a))/(a*d^4)
```

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

$$\int \frac{x^3}{a + be^c e^{dx}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b*exp(d*x+c)),x)
```

```
[Out] Integral(x**3/(a + b*exp(c)*exp(d*x)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{be^{(dx+c)} + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.2 $\int \frac{x^2}{a+be^{c+dx}}\,dx$

Optimal. Leaf size=84

$$\frac{2\text{PolyLog}\left(3,-\frac{be^{c+dx}}{a}\right)}{ad^3}-\frac{2x\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{ad^2}-\frac{x^2\log\left(\frac{be^{c+dx}}{a}+1\right)}{ad}+\frac{x^3}{3a}$$

```
[Out] x^3/(3*a) - (x^2*Log[1 + (b*E^(c + d*x))/a])/(a*d) - (2*x*PolyLog
[2, -((b*E^(c + d*x))/a)])/(a*d^2) + (2*PolyLog[3, -((b*E^(c + d*
x))/a)])/(a*d^3)
```

Rubi [A] time = 0.262524, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294

$$\frac{2\text{PolyLog}\left(3,-\frac{be^{c+dx}}{a}\right)}{ad^3}-\frac{2x\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{ad^2}-\frac{x^2\log\left(\frac{be^{c+dx}}{a}+1\right)}{ad}+\frac{x^3}{3a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b*E^(c + d*x)),x]
```

```
[Out] x^3/(3*a) - (x^2*Log[1 + (b*E^(c + d*x))/a])/(a*d) - (2*x*PolyLog
[2, -((b*E^(c + d*x))/a)])/(a*d^2) + (2*PolyLog[3, -((b*E^(c + d*
x))/a)])/(a*d^3)
```

Rubi in Sympy [A] time = 18.2331, size = 66, normalized size = 0.79

$$-\frac{x^2\log\left(\frac{ae^{-c-dx}}{b}+1\right)}{ad}+\frac{2x\operatorname{Li}_2\left(-\frac{ae^{-c-dx}}{b}\right)}{ad^2}+\frac{2\operatorname{Li}_3\left(-\frac{ae^{-c-dx}}{b}\right)}{ad^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b*exp(d*x+c)),x)
```

```
[Out] -x**2*log(a*exp(-c - d*x)/b + 1)/(a*d) + 2*x*polylog(2, -a*exp(-c
 - d*x)/b)/(a*d**2) + 2*polylog(3, -a*exp(-c - d*x)/b)/(a*d**3)
```

Mathematica [A] time = 0.0157006, size = 84, normalized size = 1.

$$\frac{2\text{PolyLog}\left(3,-\frac{be^{c+dx}}{a}\right)}{ad^3}-\frac{2x\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{ad^2}-\frac{x^2\log\left(\frac{be^{c+dx}}{a}+1\right)}{ad}+\frac{x^3}{3a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b*E^(c + d*x)),x]
```

```
[Out] x^3/(3*a) - (x^2*Log[1 + (b*E^(c + d*x))/a])/(a*d) - (2*x*PolyLog
[2, -((b*E^(c + d*x))/a)])/(a*d^2) + (2*PolyLog[3, -((b*E^(c + d*
x))/a)])/(a*d^3)
```

Maple [B] time = 0.007, size = 166, normalized size = 2.

$$\frac{x^3}{3\,a}-\frac{xc^2}{d^2a}-\frac{2\,c^3}{3\,d^3a}-\frac{x^2}{ad}\ln\left(1+\frac{b\mathrm{e}^{dx+c}}{a}\right)+\frac{c^2}{d^3a}\ln\left(1+\frac{b\mathrm{e}^{dx+c}}{a}\right)-2\,\frac{x}{d^2a}polylog\left(2,-\frac{b\mathrm{e}^{dx+c}}{a}\right)$$
$$+2\,\frac{1}{d^3a}polylog\left(3,-\frac{b\mathrm{e}^{dx+c}}{a}\right)+\frac{c^2\ln\left(\mathrm{e}^{dx+c}\right)}{d^3a}-\frac{c^2\ln\left(a+b\mathrm{e}^{dx+c}\right)}{d^3a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b*exp(d*x+c)),x)
```

```
[Out] 1/3*x^3/a-1/d^2/a*x*c^2-2/3/d^3/a*c^3-x^2*ln(1+b*exp(d*x+c)/a)/a/
d+1/d^3/a*ln(1+b*exp(d*x+c)/a)*c^2-2*x*polylog(2,-b*exp(d*x+c)/a)
/a/d^2+2*polylog(3,-b*exp(d*x+c)/a)/a/d^3+1/d^3*c^2/a*ln(exp(d*x+
c))-1/d^3*c^2/a*ln(a+b*exp(d*x+c))
```

Maxima [A] time = 0.812129, size = 97, normalized size = 1.15

$$\frac{x^3}{3\,a}-\frac{d^2x^2\log\left(\frac{be^{(dx+c)}}{a}+1\right)+2\,dx\mathrm{Li}_2\left(-\frac{be^{(dx+c)}}{a}\right)-2\,\mathrm{Li}_3(-\frac{be^{(dx+c)}}{a})}{ad^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*x^3/a - (d^2*x^2*log(b*e^(d*x + c)/a + 1) + 2*d*x*dilog(-b*e^
(d*x + c)/a) - 2*polylog(3, -b*e^(d*x + c)/a))/(a*d^3)
```

Fricas [A] time = 0.2656, size = 135, normalized size = 1.61

$$\frac{d^3x^3 - 6\,dx\mathrm{Li}_2\left(-\frac{be^{(dx+c)}+a}{a}+1\right) - 3\,c^2\log\left(be^{(dx+c)}+a\right) - 3\left(d^2x^2-c^2\right)\log\left(\frac{be^{(dx+c)}+a}{a}\right) + 6\,\mathrm{Li}_3(-\frac{be^{(dx+c)}}{a})}{3\,ad^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*(d^3*x^3 - 6*d*x*dilog(-(b*e^(d*x + c) + a)/a + 1) - 3*c^2*lo
g(b*e^(d*x + c) + a) - 3*(d^2*x^2 - c^2)*log((b*e^(d*x + c) + a)/
a) + 6*polylog(3, -b*e^(d*x + c)/a))/(a*d^3)
```

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

$$\int \frac{x^2}{a + be^c e^{dx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b*exp(d*x+c)),x)
```

```
[Out] Integral(x**2/(a + b*exp(c)*exp(d*x)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{be^{(dx+c)} + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.3 $\int \frac{x}{a+be^{c+dx}}\,dx$

Optimal. Leaf size=58

$$-\frac{\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{ad^2}-\frac{x\log\left(\frac{be^{c+dx}}{a}+1\right)}{ad}+\frac{x^2}{2a}$$

```
[Out] x^2/(2*a) - (x*Log[1 + (b*E^(c + d*x))/a])/(a*d) - PolyLog[2, -((
b*E^(c + d*x))/a)]/(a*d^2)
```

Rubi [A] time = 0.15413, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$

$$-\frac{\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{ad^2}-\frac{x\log\left(\frac{be^{c+dx}}{a}+1\right)}{ad}+\frac{x^2}{2a}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*E^(c + d*x)),x]
```

```
[Out] x^2/(2*a) - (x*Log[1 + (b*E^(c + d*x))/a])/(a*d) - PolyLog[2, -((
b*E^(c + d*x))/a)]/(a*d^2)
```

Rubi in Sympy [A] time = 9.74831, size = 39, normalized size = 0.67

$$-\frac{x\log\left(\frac{ae^{-c-dx}}{b}+1\right)}{ad}+\frac{\text{Li}_2\left(-\frac{ae^{-c-dx}}{b}\right)}{ad^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b*exp(d*x+c)),x)
```

```
[Out] -x*log(a*exp(-c - d*x)/b + 1)/(a*d) + polylog(2, -a*exp(-c - d*x)
/b)/(a*d**2)
```

Mathematica [A] time = 0.0138409, size = 58, normalized size = 1.

$$-\frac{\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{ad^2}-\frac{x\log\left(\frac{be^{c+dx}}{a}+1\right)}{ad}+\frac{x^2}{2a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b*E^(c + d*x)),x]
```

```
[Out] x^2/(2*a) - (x*Log[1 + (b*E^(c + d*x))/a])/(a*d) - PolyLog[2, -((
b*E^(c + d*x))/a)]/(a*d^2)
```

Maple [B] time = 0.006, size = 133, normalized size = 2.3

$$\frac{x^2}{2a} + \frac{xc}{da} + \frac{c^2}{2d^2a} - \frac{x}{da}\ln\left(1 + \frac{be^{dx+c}}{a}\right) - \frac{c}{d^2a}\ln\left(1 + \frac{be^{dx+c}}{a}\right) - \frac{1}{d^2a}polylog\left(2, -\frac{be^{dx+c}}{a}\right) - \frac{c\ln\left(e^{dx+c}\right)}{d^2a} + \frac{c\ln\left(a + be^{dx+c}\right)}{d^2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b*exp(d*x+c)),x)
```

```
[Out] 1/2*x^2/a+1/d/a*x*c+1/2/d^2/a*c^2-x*ln(1+b*exp(d*x+c)/a)/a/d-1/d^
2/a*ln(1+b*exp(d*x+c)/a)*c-polylog(2,-b*exp(d*x+c)/a)/a/d^2-1/d^2
*c/a*ln(exp(d*x+c))+1/d^2*c/a*ln(a+b*exp(d*x+c))
```

Maxima [A] time = 0.871188, size = 65, normalized size = 1.12

$$\frac{x^2}{2a} - \frac{dx\log\left(\frac{be^{(dx+c)}}{a} + 1\right) + \mathrm{Li}_2\left(-\frac{be^{(dx+c)}}{a}\right)}{ad^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*x^2/a - (d*x*log(b*e^(d*x + c)/a + 1) + dilog(-b*e^(d*x + c)/
a))/(a*d^2)
```

Fricas [A] time = 0.266497, size = 97, normalized size = 1.67

$$\frac{d^2x^2 + 2c\log\left(be^{(dx+c)} + a\right) - 2(dx+c)\log\left(\frac{be^{(dx+c)}+a}{a}\right) - 2\,\mathrm{Li}_2\left(-\frac{be^{(dx+c)}+a}{a} + 1\right)}{2ad^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*(d^2*x^2 + 2*c*log(b*e^(d*x + c) + a) - 2*(d*x + c)*log((b*e^
(d*x + c) + a)/a) - 2*dilog(-(b*e^(d*x + c) + a)/a + 1))/(a*d^2)
```

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

$$\int \frac{x}{a + be^c e^{dx}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b*exp(d*x+c)),x)
```

```
[Out] Integral(x/(a + b*exp(c)*exp(d*x)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{be^{(dx+c)} + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.4 $\int \frac{1}{a+be^{c+dx}}\,dx$

Optimal. Leaf size=26

$$\frac{x}{a}-\frac{\log\left(a+be^{c+dx}\right)}{ad}$$

```
[Out] x/a - Log[a + b*E^(c + d*x)]/(a*d)
```

Rubi [A] time = 0.0362134, antiderivative size = 26, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{x}{a}-\frac{\log\left(a+be^{c+dx}\right)}{ad}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*E^(c + d*x))^(-1),x]
```

```
[Out] x/a - Log[a + b*E^(c + d*x)]/(a*d)
```

Rubi in Sympy [A] time = 8.03223, size = 56, normalized size = 2.15

$$-\frac{e^{-c-dx}e^{c+dx}\log\left(a+be^{c+dx}\right)}{ad}+\frac{e^{-c-dx}e^{c+dx}\log\left(e^{c+dx}\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*exp(d*x+c)),x)
```

```
[Out] -exp(-c - d*x)*exp(c + d*x)*log(a + b*exp(c + d*x))/(a*d) + exp(-
c - d*x)*exp(c + d*x)*log(exp(c + d*x))/(a*d)
```

Mathematica [A] time = 0.00683772, size = 26, normalized size = 1.

$$\frac{x}{a}-\frac{\log\left(a+be^{c+dx}\right)}{ad}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*E^(c + d*x))^(-1),x]

[Out] x/a - Log[a + b*E^(c + d*x)]/(a*d)
```

Maple [A] time = 0.001, size = 35, normalized size = 1.4

$$\frac{\ln\left(e^{dx+c}\right)}{da}-\frac{\ln\left(a+be^{dx+c}\right)}{da}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*exp(d*x+c)),x)

[Out] 1/d/a*ln(exp(d*x+c))-ln(a+b*exp(d*x+c))/a/d
```

Maxima [A] time = 0.780702, size = 43, normalized size = 1.65

$$\frac{dx+c}{ad}-\frac{\log\left(be^{(dx+c)}+a\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] (d*x + c)/(a*d) - log(b*e^(d*x + c) + a)/(a*d)
```

Fricas [A] time = 0.247564, size = 32, normalized size = 1.23

$$\frac{dx-\log\left(be^{(dx+c)}+a\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] (d*x - log(b*e^(d*x + c) + a))/(a*d)
```

Sympy [A] time = 0.235303, size = 17, normalized size = 0.65

$$\frac{x}{a} - \frac{\log\left(\frac{a}{b} + e^{c+dx}\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*exp(d*x+c)),x)
```

```
[Out] x/a - log(a/b + exp(c + d*x))/(a*d)
```

GIAC/XCAS [A] time = 0.26498, size = 45, normalized size = 1.73

$$\frac{dx + c}{ad} - \frac{\ln\left(\left|be^{(dx+c)} + a\right|\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (d*x + c)/(a*d) - ln(abs(b*e^(d*x + c) + a))/(a*d)
```

3.5 $\int \frac{1}{\left(a+be^{c+dx}\right)x}\,dx$

Optimal. Leaf size=20

$$\text{Int}\left(\frac{1}{x\left(a+be^{c+dx}\right)},x\right)$$

```
[Out] Unintegrable[1/((a + b*E^(c + d*x))*x), x]
```

Rubi [A] time = 0.0741346, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$

$$\text{Int}\left(\frac{1}{\left(a+be^{c+dx}\right)x},x\right)$$

Verification is Not applicable to the result.

```
[In]  Int[1/((a + b*E^(c + d*x))*x),x]

[Out] Defer[Int][1/((a + b*E^(c + d*x))*x), x]
```

Rubi in Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x\left(a+be^{c+dx}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*exp(d*x+c))/x,x)

[Out] Integral(1/(x*(a + b*exp(c + d*x))), x)
```

Mathematica [A] time = 0.104162, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+be^{c+dx}\right)x}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[1/((a + b*E^(c + d*x))*x),x]

[Out] Integrate[1/((a + b*E^(c + d*x))*x), x]
```

Maple [A] time = 0.017, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a + b\mathrm{e}^{dx+c}\right) x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*exp(d*x+c))/x,x)

[Out] int(1/(a+b*exp(d*x+c))/x,x)
```

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

$$\int \frac{1}{\left(be^{(dx+c)} + a\right) x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] integrate(1/((b*e^(d*x + c) + a)*x), x)
```

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

$$\text{integral}\left(\frac{1}{bxe^{(dx+c)} + ax}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] integral(1/(b*x*e^(d*x + c) + a*x), x)
```

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

$$\int \frac{1}{x\left(a + be^{c}e^{dx}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*exp(d*x+c))/x,x)

[Out] Integral(1/(x*(a + b*exp(c)*exp(d*x))), x)
```

GIAC/XCAS [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(be^{(dx+c)} + a\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] integrate(1/((b*e^(d*x + c) + a)*x), x)
```

3.6 $\int \frac{1}{\left(a+be^{c+dx}\right)x^2}\,dx$

Optimal. Leaf size=20

$$\operatorname{Int}\left(\frac{1}{x^2\left(a+be^{c+dx}\right)},x\right)$$

```
[Out] Unintegrable[1/((a + b*E^(c + d*x))*x^2), x]
```

Rubi [A] time = 0.0710737, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.

$$\operatorname{Int}\left(\frac{1}{\left(a+be^{c+dx}\right)x^2},x\right)$$

Verification is Not applicable to the result.

```
[In]  Int[1/((a + b*E^(c + d*x))*x^2),x]

[Out] Defer[Int][1/((a + b*E^(c + d*x))*x^2), x]
```

Rubi in Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x^2\left(a+be^{c+dx}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*exp(d*x+c))/x**2,x)

[Out] Integral(1/(x**2*(a + b*exp(c + d*x))), x)
```

Mathematica [A] time = 0.235548, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+be^{c+dx}\right)x^2}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[1/((a + b*E^(c + d*x))*x^2),x]

[Out] Integrate[1/((a + b*E^(c + d*x))*x^2), x]
```

Maple [A] time = 0.019, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] int(1/(a+b*exp(d*x+c))/x^2,x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] integrate(1/((b*e^(d*x + c) + a)*x^2), x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Integral(1/(x**2*(a + b*exp(c)*exp(d*x))), x)
```

GIAC/XCAS [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(be^{(dx+c)} + a\right)x^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(1/((b*e^(d*x + c) + a)*x^2), x)
```

3.7 $\int \frac{1}{a+be^{c-dx}}\,dx$

Optimal. Leaf size=26

$$\frac{\log\left(a+be^{c-dx}\right)}{ad}+\frac{x}{a}$$

```
[Out] x/a + Log[a + b*E^(c - d*x)]/(a*d)
```

Rubi [A] time = 0.0413536, antiderivative size = 26, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286

$$\frac{\log\left(a+be^{c-dx}\right)}{ad}+\frac{x}{a}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*E^(c - d*x))^(-1),x]
```

```
[Out] x/a + Log[a + b*E^(c - d*x)]/(a*d)
```

Rubi in Sympy [A] time = 9.0251, size = 53, normalized size = 2.04

$$\frac{e^{-c+dx}e^{c-dx}\log\left(a+be^{c-dx}\right)}{ad}-\frac{e^{-c+dx}e^{c-dx}\log\left(e^{c-dx}\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b*exp(-d*x+c)),x)
```

```
[Out] exp(-c + d*x)*exp(c - d*x)*log(a + b*exp(c - d*x))/(a*d) - exp(-c
 + d*x)*exp(c - d*x)*log(exp(c - d*x))/(a*d)
```

Mathematica [A] time = 0.0134729, size = 21, normalized size = 0.81

$$\frac{\log\left(ae^{dx}+be^{c}\right)}{ad}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*E^(c - d*x))^(-1),x]

[Out] Log[b*E^c + a*E^(d*x)]/(a*d)
```

Maple [A] time = 0.004, size = 37, normalized size = 1.4

$$-\frac{\ln\left(\mathrm{e}^{-dx+c}\right)}{da}+\frac{\ln\left(a+b\mathrm{e}^{-dx+c}\right)}{da}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*exp(-d*x+c)),x)

[Out] -1/d/a*ln(exp(-d*x+c))+ln(a+b*exp(-d*x+c))/a/d
```

Maxima [A] time = 0.785641, size = 46, normalized size = 1.77

$$\frac{dx-c}{ad}+\frac{\log\left(be^{(-dx+c)}+a\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] (d*x - c)/(a*d) + log(b*e^(-d*x + c) + a)/(a*d)
```

Fricas [A] time = 0.258958, size = 31, normalized size = 1.19

$$\frac{dx+\log\left(be^{(-dx+c)}+a\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] (d*x + log(b*e^(-d*x + c) + a))/(a*d)
```

Sympy [A] time = 0.249047, size = 17, normalized size = 0.65

$$\frac{x}{a} + \frac{\log\left(\frac{a}{b} + e^{c-dx}\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*exp(-d*x+c)),x)

[Out] x/a + log(a/b + exp(c - d*x))/(a*d)
```

GIAC/XCAS [A] time = 0.245254, size = 47, normalized size = 1.81

$$\frac{dx-c}{ad} + \frac{\ln\left(\left|be^{(-dx+c)} + a\right|\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] (d*x - c)/(a*d) + ln(abs(b*e^(-d*x + c) + a))/(a*d)
```

3.8 $\int \frac{1}{a+be^{-c-dx}}\,dx$

Optimal. Leaf size=28

$$\frac{\log\left(a+be^{-c-dx}\right)}{ad}+\frac{x}{a}$$

```
[Out] x/a + Log[a + b*E^(-c - d*x)]/(a*d)
```

Rubi [A] time = 0.0439113, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25

$$\frac{\log\left(a+be^{-c-dx}\right)}{ad}+\frac{x}{a}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*E^(-c - d*x))^(-1),x]
```

```
[Out] x/a + Log[a + b*E^(-c - d*x)]/(a*d)
```

Rubi in Sympy [A] time = 8.75816, size = 60, normalized size = 2.14

$$\frac{e^{-c-dx}e^{c+dx}\log\left(a+be^{-c-dx}\right)}{ad}-\frac{e^{-c-dx}e^{c+dx}\log\left(e^{-c-dx}\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*exp(-d*x-c)),x)
```

```
[Out] exp(-c - d*x)*exp(c + d*x)*log(a + b*exp(-c - d*x))/(a*d) - exp(-
c - d*x)*exp(c + d*x)*log(exp(-c - d*x))/(a*d)
```

Mathematica [A] time = 0.0130159, size = 19, normalized size = 0.68

$$\frac{\log\left(ae^{c+dx}+b\right)}{ad}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*E^(-c - d*x))^(-1),x]
```

```
[Out] Log[b + a*E^(c + d*x)]/(a*d)
```

Maple [A] time = 0.004, size = 41, normalized size = 1.5

$$-\frac{\ln\left(e^{-dx-c}\right)}{da}+\frac{\ln\left(a+b e^{-dx-c}\right)}{da}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*exp(-d*x-c)),x)
```

```
[Out] -1/d/a*ln(exp(-d*x-c))+ln(a+b*exp(-d*x-c))/a/d
```

Maxima [A] time = 0.756931, size = 46, normalized size = 1.64

$$\frac{dx+c}{ad}+\frac{\log\left(be^{(-dx-c)}+a\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (d*x + c)/(a*d) + log(b*e^(-d*x - c) + a)/(a*d)
```

Fricas [A] time = 0.258171, size = 34, normalized size = 1.21

$$\frac{dx+\log\left(be^{(-dx-c)}+a\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (d*x + log(b*e^(-d*x - c) + a))/(a*d)
```

Sympy [A] time = 0.254066, size = 19, normalized size = 0.68

$$\frac{x}{a} + \frac{\log\left(\frac{a}{b} + e^{-c-dx}\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*exp(-d*x-c)),x)

[Out] x/a + log(a/b + exp(-c - d*x))/(a*d)
```

GIAC/XCAS [A] time = 0.285751, size = 47, normalized size = 1.68

$$\frac{dx + c}{ad} + \frac{\ln\left(\left|be^{(-dx-c)} + a\right|\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] (d*x + c)/(a*d) + ln(abs(b*e^(-d*x - c) + a))/(a*d)
```

3.9 $\int \frac{x^3}{(a+be^{c+dx})^2}\,dx$

Optimal. Leaf size=217

$$-\frac{6\text{PolyLog}\left(3,-\frac{be^{c+dx}}{a}\right)}{a^2d^4}-\frac{6\text{PolyLog}\left(4,-\frac{be^{c+dx}}{a}\right)}{a^2d^4}+\frac{6x\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{a^2d^3}+\frac{6x\text{PolyLog}\left(3,-\frac{be^{c+dx}}{a}\right)}{a^2d^3}-\frac{3x^2\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{a^2d^2}+\frac{3x^2\log\left(\frac{be^{c+dx}}{a}+1\right)}{a^2d^2}-\frac{x^3\log\left(\frac{be^{c+dx}}{a}+1\right)}{a^2d}-\frac{x^3}{a^2d}+\frac{x^4}{4a^2}+\frac{x^3}{ad\left(a+be^{c+dx}\right)}$$

```
[Out] -(x^3/(a^2*d)) + x^3/(a*d*(a + b*E^(c + d*x))) + x^4/(4*a^2) + (3
*x^2*Log[1 + (b*E^(c + d*x))/a])/(a^2*d^2) - (x^3*Log[1 + (b*E^(c
 + d*x))/a])/(a^2*d) + (6*x*PolyLog[2, -((b*E^(c + d*x))/a)])/(a^
2*d^3) - (3*x^2*PolyLog[2, -((b*E^(c + d*x))/a)])/(a^2*d^2) - (6*
PolyLog[3, -((b*E^(c + d*x))/a)])/(a^2*d^4) + (6*x*PolyLog[3, -((
b*E^(c + d*x))/a)])/(a^2*d^3) - (6*PolyLog[4, -((b*E^(c + d*x))/a
)])/(a^2*d^4)
```

Rubi [A] time = 0.789913, antiderivative size = 217, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 8, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.471

$$-\frac{6\text{PolyLog}\left(3,-\frac{be^{c+dx}}{a}\right)}{a^2d^4}-\frac{6\text{PolyLog}\left(4,-\frac{be^{c+dx}}{a}\right)}{a^2d^4}+\frac{6x\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{a^2d^3}+\frac{6x\text{PolyLog}\left(3,-\frac{be^{c+dx}}{a}\right)}{a^2d^3}-\frac{3x^2\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{a^2d^2}+\frac{3x^2\log\left(\frac{be^{c+dx}}{a}+1\right)}{a^2d^2}-\frac{x^3\log\left(\frac{be^{c+dx}}{a}+1\right)}{a^2d}-\frac{x^3}{a^2d}+\frac{x^4}{4a^2}+\frac{x^3}{ad\left(a+be^{c+dx}\right)}$$

Antiderivative was successfully verified.

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

```
[Out] -(x^3/(a^2*d)) + x^3/(a*d*(a + b*E^(c + d*x))) + x^4/(4*a^2) + (3
*x^2*Log[1 + (b*E^(c + d*x))/a])/(a^2*d^2) - (x^3*Log[1 + (b*E^(c
 + d*x))/a])/(a^2*d) + (6*x*PolyLog[2, -((b*E^(c + d*x))/a)])/(a^
2*d^3) - (3*x^2*PolyLog[2, -((b*E^(c + d*x))/a)])/(a^2*d^2) - (6*
PolyLog[3, -((b*E^(c + d*x))/a)])/(a^2*d^4) + (6*x*PolyLog[3, -((
b*E^(c + d*x))/a)])/(a^2*d^3) - (6*PolyLog[4, -((b*E^(c + d*x))/a
)])/(a^2*d^4)
```

Rubi in Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: PolificationFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b*exp(d*x+c))**2,x)
```

```
[Out] Exception raised: PolificationFailed
```

Mathematica [A] time = 0.277544, size = 158, normalized size = 0.73

$$\frac{\frac{24(dx-1)\text{PolyLog}\left(3,-\frac{be^{c+dx}}{a}\right)}{d^4}-\frac{24\text{PolyLog}\left(4,-\frac{be^{c+dx}}{a}\right)}{d^4}-\frac{12x(dx-2)\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{d^3}+\frac{12x^2\log\left(\frac{be^{c+dx}}{a}+1\right)}{d^2}+\frac{4ax^3}{ad+bde^{c+dx}}-4x^3\text{lo}\cdots}{4a^2}$$

Antiderivative was successfully verified.

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

```
[Out] ((-4*x^3)/d + (4*a*x^3)/(a*d + b*d*E^(c + d*x)) + x^4 + (12*x^2*L
og[1 + (b*E^(c + d*x))/a])/d^2 - (4*x^3*Log[1 + (b*E^(c + d*x))/a
])/d - (12*x*(-2 + d*x)*PolyLog[2, -((b*E^(c + d*x))/a)])/d^3 + (
24*(-1 + d*x)*PolyLog[3, -((b*E^(c + d*x))/a)])/d^4 - (24*PolyLog
[4, -((b*E^(c + d*x))/a)])/d^4)/(4*a^2)
```

Maple [A] time = 0.072, size = 382, normalized size = 1.8

$$\frac{x^3}{da\left(a+b\mathrm{e}^{dx+c}\right)}+\frac{3\,c^4}{4\,a^2d^4}-6\,\frac{1}{a^2d^4}polylog\left(4,-\frac{b\mathrm{e}^{dx+c}}{a}\right)-6\,\frac{1}{a^2d^4}polylog\left(3,-\frac{b\mathrm{e}^{dx+c}}{a}\right)$$
$$+2\,\frac{c^3}{a^2d^4}-3\,\frac{c^2\ln\left(\mathrm{e}^{dx+c}\right)}{a^2d^4}+3\,\frac{c^2\ln\left(a+b\mathrm{e}^{dx+c}\right)}{a^2d^4}-\frac{c^3\ln\left(\mathrm{e}^{dx+c}\right)}{a^2d^4}$$
$$+\frac{c^3\ln\left(a+b\mathrm{e}^{dx+c}\right)}{a^2d^4}+\frac{x^4}{4\,a^2}-\frac{x^3}{a^2d}-\frac{c^3}{a^2d^4}\ln\left(1+\frac{b\mathrm{e}^{dx+c}}{a}\right)-3\,\frac{c^2}{a^2d^4}\ln\left(1+\frac{b\mathrm{e}^{dx+c}}{a}\right)$$
$$-3\,\frac{x^2}{a^2d^2}polylog\left(2,-\frac{b\mathrm{e}^{dx+c}}{a}\right)-\frac{x^3}{a^2d}\ln\left(1+\frac{b\mathrm{e}^{dx+c}}{a}\right)+3\,\frac{x^2}{a^2d^2}\ln\left(1+\frac{b\mathrm{e}^{dx+c}}{a}\right)$$
$$+6\,\frac{x}{a^2d^3}polylog\left(2,-\frac{b\mathrm{e}^{dx+c}}{a}\right)+6\,\frac{x}{a^2d^3}polylog\left(3,-\frac{b\mathrm{e}^{dx+c}}{a}\right)+3\,\frac{c^2x}{a^2d^3}+\frac{c^3x}{a^2d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x^3/a/d/(a+b*exp(d*x+c))+3/4/a^2/d^4*c^4-6*polylog(4,-b*exp(d*x+c
)/a)/a^2/d^4-6*polylog(3,-b*exp(d*x+c)/a)/a^2/d^4+2/a^2/d^4*c^3-3
/a^2/d^4*c^2*ln(exp(d*x+c))+3/a^2/d^4*c^2*ln(a+b*exp(d*x+c))-1/a^
2/d^4*c^3*ln(exp(d*x+c))+1/a^2/d^4*c^3*ln(a+b*exp(d*x+c))+1/4*x^4
/a^2-x^3/a^2/d-1/a^2/d^4*c^3*ln(1+b*exp(d*x+c)/a)-3/a^2/d^4*c^2*l
n(1+b*exp(d*x+c)/a)-3*x^2*polylog(2,-b*exp(d*x+c)/a)/a^2/d^2-x^3*
ln(1+b*exp(d*x+c)/a)/a^2/d+3*x^2*ln(1+b*exp(d*x+c)/a)/a^2/d^2+6*x
*polylog(2,-b*exp(d*x+c)/a)/a^2/d^3+6*x*polylog(3,-b*exp(d*x+c)/a
)/a^2/d^3+3/a^2/d^3*c^2*x+1/a^2/d^3*c^3*x
```

Maxima [A] time = 0.797398, size = 263, normalized size = 1.21

$$\frac{x^3}{abde^{(dx+c)} + a^2 d} + \frac{d^4x^4 - 4\,d^3x^3}{4\,a^2d^4} - \frac{d^3x^3\log\left(\frac{be^{(dx+c)}}{a} + 1\right) + 3\,d^2x^2\mathrm{Li}_2\left(-\frac{be^{(dx+c)}}{a}\right) - 6\,dx\mathrm{Li}_3(-\frac{be^{(dx+c)}}{a}) + 6\,\mathrm{Li}_4(-\frac{be^{(dx+c)}}{a})}{a^2d^4} + \frac{3\left(d^2x^2\log\left(\frac{be^{(dx+c)}}{a} + 1\right) + 2\,dx\mathrm{Li}_2\left(-\frac{be^{(dx+c)}}{a}\right) - 2\,\mathrm{Li}_3(-\frac{be^{(dx+c)}}{a})\right)}{a^2d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x^3/(a*b*d*e^(d*x + c) + a^2*d) + 1/4*(d^4*x^4 - 4*d^3*x^3)/(a^2*
d^4) - (d^3*x^3*log(b*e^(d*x + c)/a + 1) + 3*d^2*x^2*dilog(-b*e^(
d*x + c)/a) - 6*d*x*polylog(3, -b*e^(d*x + c)/a) + 6*polylog(4, -
b*e^(d*x + c)/a))/(a^2*d^4) + 3*(d^2*x^2*log(b*e^(d*x + c)/a + 1)
 + 2*d*x*dilog(-b*e^(d*x + c)/a) - 2*polylog(3, -b*e^(d*x + c)/a)
)/(a^2*d^4)
```

Fricas [A] time = 0.260912, size = 446, normalized size = 2.06

$$ad^4x^4 - ac^4 - 4\,ac^3 - 12\left(ad^2x^2 - 2\,adx + \left(bd^2x^2 - 2\,bdx\right)e^{(dx+c)}\right)\mathrm{Li}_2\left(-\frac{be^{(dx+c)}+a}{a} + 1\right) + \left(bd^4x^4 - 4\,bd^3x^3 - bc^4 - 4\,bc^3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*(a*d^4*x^4 - a*c^4 - 4*a*c^3 - 12*(a*d^2*x^2 - 2*a*d*x + (b*d
^2*x^2 - 2*b*d*x)*e^(d*x + c))*dilog(-(b*e^(d*x + c) + a)/a + 1)
+ (b*d^4*x^4 - 4*b*d^3*x^3 - b*c^4 - 4*b*c^3)*e^(d*x + c) + 4*(a*
c^3 + 3*a*c^2 + (b*c^3 + 3*b*c^2)*e^(d*x + c))*log(b*e^(d*x + c)
+ a) - 4*(a*d^3*x^3 - 3*a*d^2*x^2 + a*c^3 + 3*a*c^2 + (b*d^3*x^3
- 3*b*d^2*x^2 + b*c^3 + 3*b*c^2)*e^(d*x + c))*log((b*e^(d*x + c)
+ a)/a) - 24*(b*e^(d*x + c) + a)*polylog(4, -b*e^(d*x + c)/a) + 2
4*(a*d*x + (b*d*x - b)*e^(d*x + c) - a)*polylog(3, -b*e^(d*x + c)
/a))/(a^2*b*d^4*e^(d*x + c) + a^3*d^4)
```

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

$$\frac{x^3}{a^2d + abde^{c+dx}} + \frac{\int \left(-\frac{3x^2}{a+be^ce^{dx}}\right)\,dx + \int \frac{dx^3}{a+be^ce^{dx}}\,dx}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.10 $\int \frac{x^2}{\left(a+be^{c+dx}\right)^2}\,dx$

Optimal. Leaf size=165

$$\frac{2\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{a^2d^3}+\frac{2\text{PolyLog}\left(3,-\frac{be^{c+dx}}{a}\right)}{a^2d^3}-\frac{2x\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{a^2d^2}+\frac{2x\log\left(\frac{be^{c+dx}}{a}+1\right)}{a^2d^2}-\frac{x^2\log\left(\frac{be^{c+dx}}{a}+1\right)}{a^2d}-\frac{x^2}{a^2d}+\frac{x^3}{3a^2}+\frac{x^2}{ad\left(a+be^{c+dx}\right)}$$

```
[Out] -(x^2/(a^2*d)) + x^2/(a*d*(a + b*E^(c + d*x))) + x^3/(3*a^2) + (2
*x*Log[1 + (b*E^(c + d*x))/a])/(a^2*d^2) - (x^2*Log[1 + (b*E^(c +
 d*x))/a])/(a^2*d) + (2*PolyLog[2, -((b*E^(c + d*x))/a)])/(a^2*d^
3) - (2*x*PolyLog[2, -((b*E^(c + d*x))/a)])/(a^2*d^2) + (2*PolyLo
g[3, -((b*E^(c + d*x))/a)])/(a^2*d^3)
```

Rubi [A] time = 0.633445, antiderivative size = 165, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 9, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.529

$$\frac{2\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{a^2d^3}+\frac{2\text{PolyLog}\left(3,-\frac{be^{c+dx}}{a}\right)}{a^2d^3}-\frac{2x\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{a^2d^2}+\frac{2x\log\left(\frac{be^{c+dx}}{a}+1\right)}{a^2d^2}-\frac{x^2\log\left(\frac{be^{c+dx}}{a}+1\right)}{a^2d}-\frac{x^2}{a^2d}+\frac{x^3}{3a^2}+\frac{x^2}{ad\left(a+be^{c+dx}\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b*E^(c + d*x))^2,x]
```

```
[Out] -(x^2/(a^2*d)) + x^2/(a*d*(a + b*E^(c + d*x))) + x^3/(3*a^2) + (2
*x*Log[1 + (b*E^(c + d*x))/a])/(a^2*d^2) - (x^2*Log[1 + (b*E^(c +
 d*x))/a])/(a^2*d) + (2*PolyLog[2, -((b*E^(c + d*x))/a)])/(a^2*d^
3) - (2*x*PolyLog[2, -((b*E^(c + d*x))/a)])/(a^2*d^2) + (2*PolyLo
g[3, -((b*E^(c + d*x))/a)])/(a^2*d^3)
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b*exp(d*x+c))**2,x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.32725, size = 113, normalized size = 0.68

$$\frac{(6-6dx)\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)+6\text{PolyLog}\left(3,-\frac{be^{c+dx}}{a}\right)+\frac{d^2x^2\left(adx+b(dx-3)e^{c+dx}\right)}{a+be^{c+dx}}-3dx(dx-2)\log\left(\frac{be^{c+dx}}{a}+1\right)}{3a^2d^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b*E^(c + d*x))^2,x]
```

```
[Out] ((d^2*x^2*(a*d*x + b*E^(c + d*x)*(-3 + d*x)))/(a + b*E^(c + d*x))
 - 3*d*x*(-2 + d*x)*Log[1 + (b*E^(c + d*x))/a] + (6 - 6*d*x)*Poly
Log[2, -((b*E^(c + d*x))/a)] + 6*PolyLog[3, -((b*E^(c + d*x))/a)]
)/(3*a^2*d^3)
```

Maple [B] time = 0.062, size = 324, normalized size = 2.

$$\frac{x^2}{da\left(a+b\mathrm{e}^{dx+c}\right)}+\frac{c^2\ln\left(\mathrm{e}^{dx+c}\right)}{a^2d^3}-\frac{c^2\ln\left(a+b\mathrm{e}^{dx+c}\right)}{a^2d^3}+\frac{x^3}{3\,a^2}-\frac{c^2x}{a^2d^2}-\frac{2\,c^3}{3\,a^2d^3}-\frac{x^2}{a^2d}\ln\left(1+\frac{b\mathrm{e}^{dx+c}}{a}\right)+\frac{c^2}{a^2d^3}\ln\left(1+\frac{b\mathrm{e}^{dx+c}}{a}\right)-2\,\frac{x}{a^2d^2}\mathit{polylog}\left(2,-\frac{b\mathrm{e}^{dx+c}}{a}\right)+2\,\frac{1}{a^2d^3}\mathit{polylog}\left(3,-\frac{b\mathrm{e}^{dx+c}}{a}\right)+2\,\frac{c\ln\left(\mathrm{e}^{dx+c}\right)}{a^2d^3}-2\,\frac{c\ln\left(a+b\mathrm{e}^{dx+c}\right)}{a^2d^3}-\frac{x^2}{a^2d}-2\,\frac{xc}{a^2d^2}-\frac{c^2}{a^2d^3}+2\,\frac{x}{a^2d^2}\ln\left(1+\frac{b\mathrm{e}^{dx+c}}{a}\right)+2\,\frac{c}{a^2d^3}\ln\left(1+\frac{b\mathrm{e}^{dx+c}}{a}\right)+2\,\frac{1}{a^2d^3}\mathit{polylog}\left(2,-\frac{b\mathrm{e}^{dx+c}}{a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b*exp(d*x+c))^2,x)
```

```
[Out] x^2/a/d/(a+b*exp(d*x+c))+1/a^2/d^3*c^2*ln(exp(d*x+c))-1/a^2/d^3*c
^2*ln(a+b*exp(d*x+c))+1/3*x^3/a^2-1/a^2/d^2*c^2*x-2/3/a^2/d^3*c^3
-x^2*ln(1+b*exp(d*x+c)/a)/a^2/d+1/a^2/d^3*ln(1+b*exp(d*x+c)/a)*c^
2-2*x*polylog(2,-b*exp(d*x+c)/a)/a^2/d^2+2*polylog(3,-b*exp(d*x+c
)/a)/a^2/d^3+2/a^2/d^3*c*ln(exp(d*x+c))-2/a^2/d^3*c*ln(a+b*exp(d*
x+c))-x^2/a^2/d-2/a^2/d^2*c*x-1/a^2/d^3*c^2+2*x*ln(1+b*exp(d*x+c)
/a)/a^2/d^2+2/a^2/d^3*ln(1+b*exp(d*x+c)/a)*c+2*polylog(2,-b*exp(d
```

```
*x+c)/a)/a^2/d^3
```

Maxima [A] time = 0.802697, size = 201, normalized size = 1.22

$$\frac{x^2}{abde^{(dx+c)} + a^2d} + \frac{d^3x^3 - 3\,d^2x^2}{3\,a^2d^3} - \frac{d^2x^2\log\left(\frac{be^{(dx+c)}}{a} + 1\right) + 2\,dx\mathrm{Li}_2\left(-\frac{be^{(dx+c)}}{a}\right) - 2\,\mathrm{Li}_3(-\frac{be^{(dx+c)}}{a})}{a^2d^3} + \frac{2\left(dx\log\left(\frac{be^{(dx+c)}}{a} + 1\right) + \mathrm{Li}_2\left(-\frac{be^{(dx+c)}}{a}\right)\right)}{a^2d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x^2/(a*b*d*e^(d*x + c) + a^2*d) + 1/3*(d^3*x^3 - 3*d^2*x^2)/(a^2*
d^3) - (d^2*x^2*log(b*e^(d*x + c)/a + 1) + 2*d*x*dilog(-b*e^(d*x
+ c)/a) - 2*polylog(3, -b*e^(d*x + c)/a))/(a^2*d^3) + 2*(d*x*log(
b*e^(d*x + c)/a + 1) + dilog(-b*e^(d*x + c)/a))/(a^2*d^3)
```

Fricas [A] time = 0.25524, size = 355, normalized size = 2.15

$$ad^3x^3 + ac^3 + 3\,ac^2 - 6\left(adx + (bdx - b)e^{(dx+c)} - a\right)\mathrm{Li}_2\left(-\frac{be^{(dx+c)}+a}{a} + 1\right) + \left(bd^3x^3 - 3\,bd^2x^2 + bc^3 + 3\,bc^2\right)e^{(dx+c)} - 3\left(ac^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*(a*d^3*x^3 + a*c^3 + 3*a*c^2 - 6*(a*d*x + (b*d*x - b)*e^(d*x
+ c) - a)*dilog(-(b*e^(d*x + c) + a)/a + 1) + (b*d^3*x^3 - 3*b*d^
2*x^2 + b*c^3 + 3*b*c^2)*e^(d*x + c) - 3*(a*c^2 + 2*a*c + (b*c^2
+ 2*b*c)*e^(d*x + c))*log(b*e^(d*x + c) + a) - 3*(a*d^2*x^2 - a*c
^2 - 2*a*d*x - 2*a*c + (b*d^2*x^2 - b*c^2 - 2*b*d*x - 2*b*c)*e^(d
*x + c))*log((b*e^(d*x + c) + a)/a) + 6*(b*e^(d*x + c) + a)*polyl
og(3, -b*e^(d*x + c)/a))/(a^2*b*d^3*e^(d*x + c) + a^3*d^3)
```

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

$$\frac{x^2}{a^2d + abde^{c+dx}} + \frac{\int\left(-\frac{2x}{a+be^ce^{dx}}\right)\,dx + \int\frac{dx^2}{a+be^ce^{dx}}\,dx}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b*exp(d*x+c))**2,x)
```

```
[Out] x**2/(a**2*d + a*b*d*exp(c + d*x)) + (Integral(-2*x/(a + b*exp(c)
*exp(d*x)), x) + Integral(d*x**2/(a + b*exp(c)*exp(d*x)), x))/(a*
d)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\left(be^{(dx+c)} + a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.11 $\int \frac{x}{\left(a+be^{c+dx}\right)^2}\,dx$

Optimal. Leaf size=107

$$-\frac{\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{a^2d^2}+\frac{\log\left(a+be^{c+dx}\right)}{a^2d^2}-\frac{x\log\left(\frac{be^{c+dx}}{a}+1\right)}{a^2d}-\frac{x}{a^2d}+\frac{x^2}{2a^2}+\frac{x}{ad\left(a+be^{c+dx}\right)}$$

```
[Out] -(x/(a^2*d)) + x/(a*d*(a + b*E^(c + d*x))) + x^2/(2*a^2) + Log[a
+ b*E^(c + d*x)]/(a^2*d^2) - (x*Log[1 + (b*E^(c + d*x))/a])/(a^2*
d) - PolyLog[2, -((b*E^(c + d*x))/a)]/(a^2*d^2)
```

Rubi [A] time = 0.324003, antiderivative size = 107, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 10, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667

$$-\frac{\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{a^2d^2}+\frac{\log\left(a+be^{c+dx}\right)}{a^2d^2}-\frac{x\log\left(\frac{be^{c+dx}}{a}+1\right)}{a^2d}-\frac{x}{a^2d}+\frac{x^2}{2a^2}+\frac{x}{ad\left(a+be^{c+dx}\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*E^(c + d*x))^2,x]
```

```
[Out] -(x/(a^2*d)) + x/(a*d*(a + b*E^(c + d*x))) + x^2/(2*a^2) + Log[a
+ b*E^(c + d*x)]/(a^2*d^2) - (x*Log[1 + (b*E^(c + d*x))/a])/(a^2*
d) - PolyLog[2, -((b*E^(c + d*x))/a)]/(a^2*d^2)
```

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

$$\frac{xe^{-c-dx}e^{c+dx}}{ad\left(a+be^{c+dx}\right)}+\frac{\int x\,dx}{a^2}-\frac{xe^{-c-dx}e^{c+dx}\log\left(a+be^{c+dx}\right)}{a^2d}$$
$$+\frac{xe^{-c-dx}e^{c+dx}\log\left(e^{c+dx}\right)}{a^2d}-\frac{x\log\left(1+\frac{be^{c+dx}}{a}\right)}{a^2d}+\frac{x\log\left(a+be^{c+dx}\right)}{a^2d}$$
$$-\frac{x\log\left(e^{c+dx}\right)}{a^2d}+\frac{\log\left(a+be^{c+dx}\right)}{a^2d^2}-\frac{\log\left(e^{c+dx}\right)}{a^2d^2}-\frac{\text{Li}_2\left(-\frac{be^{c+dx}}{a}\right)}{a^2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b*exp(d*x+c))**2,x)
```

```
[Out] x*exp(-c - d*x)*exp(c + d*x)/(a*d*(a + b*exp(c + d*x))) + Integra
l(x, x)/a**2 - x*exp(-c - d*x)*exp(c + d*x)*log(a + b*exp(c + d*x
))/(a**2*d) + x*exp(-c - d*x)*exp(c + d*x)*log(exp(c + d*x))/(a**
2*d) - x*log(1 + b*exp(c + d*x)/a)/(a**2*d) + x*log(a + b*exp(c +
 d*x))/(a**2*d) - x*log(exp(c + d*x))/(a**2*d) + log(a + b*exp(c
+ d*x))/(a**2*d**2) - log(exp(c + d*x))/(a**2*d**2) - polylog(2,
-b*exp(c + d*x)/a)/(a**2*d**2)
```

Mathematica [A] time = 0.153561, size = 85, normalized size = 0.79

$$\frac{-2\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)+\frac{dx\left(adx+b(dx-2)e^{c+dx}\right)}{a+be^{c+dx}}-2(dx-1)\log\left(\frac{be^{c+dx}}{a}+1\right)}{2a^2d^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b*E^(c + d*x))^2,x]
```

```
[Out] ((d*x*(a*d*x + b*E^(c + d*x)*(-2 + d*x)))/(a + b*E^(c + d*x)) - 2
*(-1 + d*x)*Log[1 + (b*E^(c + d*x))/a] - 2*PolyLog[2, -((b*E^(c +
 d*x))/a)])/(2*a^2*d^2)
```

Maple [C] time = 0.041, size = 231, normalized size = 2.2

$$\frac{x^2}{2\,a^2}+\frac{xc}{da^2}+\frac{c^2}{2\,d^2a^2}+\frac{\ln\left(a+b\mathrm{e}^{dx+c}\right)}{d^2a^2}-\frac{b\mathrm{e}^{dx+c}x}{da^2\left(a+b\mathrm{e}^{dx+c}\right)}-\frac{b\mathrm{e}^{dx+c}c}{d^2a^2\left(a+b\mathrm{e}^{dx+c}\right)}-\frac{1}{d^2a^2}dilog\left(\frac{a+b\mathrm{e}^{dx+c}}{a}\right)-\frac{x}{da^2}\ln\left(\frac{a+b\mathrm{e}^{dx+c}}{a}\right)-\frac{c}{d^2a^2}\ln\left(\frac{a+b\mathrm{e}^{dx+c}}{a}\right)-\frac{c\ln\left(\mathrm{e}^{dx+c}\right)}{d^2a^2}+\frac{c\ln\left(a+b\mathrm{e}^{dx+c}\right)}{d^2a^2}-\frac{c}{d^2a\left(a+b\mathrm{e}^{dx+c}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b*exp(d*x+c))^2,x)
```

```
[Out] 1/2*x^2/a^2+1/d/a^2*x*c+1/2/d^2/a^2*c^2+ln(a+b*exp(d*x+c))/a^2/d^
2-1/d/a^2*b*exp(d*x+c)/(a+b*exp(d*x+c))*x-1/d^2/a^2*b*exp(d*x+c)/
(a+b*exp(d*x+c))*c-1/d^2/a^2*dilog((a+b*exp(d*x+c))/a)-1/d/a^2*ln
((a+b*exp(d*x+c))/a)*x-1/d^2/a^2*ln((a+b*exp(d*x+c))/a)*c-1/d^2*c
/a^2*ln(exp(d*x+c))+1/d^2*c/a^2*ln(a+b*exp(d*x+c))-1/d^2*c/a/(a+b
*exp(d*x+c))
```

Maxima [A] time = 0.791863, size = 128, normalized size = 1.2

$$\frac{x}{abde^{(dx+c)} + a^2d} + \frac{x^2}{2\,a^2} - \frac{x}{a^2d} - \frac{dx\log\left(\frac{be^{(dx+c)}}{a} + 1\right) + \mathrm{Li}_2\left(-\frac{be^{(dx+c)}}{a}\right)}{a^2d^2} + \frac{\log\left(be^{(dx+c)} + a\right)}{a^2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x/(a*b*d*e^(d*x + c) + a^2*d) + 1/2*x^2/a^2 - x/(a^2*d) - (d*x*lo
g(b*e^(d*x + c)/a + 1) + dilog(-b*e^(d*x + c)/a))/(a^2*d^2) + log
(b*e^(d*x + c) + a)/(a^2*d^2)
```

Fricas [A] time = 0.255239, size = 238, normalized size = 2.22

$$\frac{ad^2x^2 - ac^2 - 2\,ac - 2\left(be^{(dx+c)} + a\right)\mathrm{Li}_2\left(-\frac{be^{(dx+c)}+a}{a} + 1\right) + \left(bd^2x^2 - bc^2 - 2\,bdx - 2\,bc\right)e^{(dx+c)} + 2\left(ac + (bc+b)e^{(dx+c)} + \right.}{2\left(a^2bd^2e^{(dx+c)} + a^3d^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*(a*d^2*x^2 - a*c^2 - 2*a*c - 2*(b*e^(d*x + c) + a)*dilog(-(b*
e^(d*x + c) + a)/a + 1) + (b*d^2*x^2 - b*c^2 - 2*b*d*x - 2*b*c)*e
^(d*x + c) + 2*(a*c + (b*c + b)*e^(d*x + c) + a)*log(b*e^(d*x + c
) + a) - 2*(a*d*x + a*c + (b*d*x + b*c)*e^(d*x + c))*log((b*e^(d*
x + c) + a)/a))/(a^2*b*d^2*e^(d*x + c) + a^3*d^2)
```

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

$$\frac{x}{a^2d + abde^{c+dx}} + \frac{\int \frac{dx}{a+be^ce^{dx}}\,dx + \int\left(-\frac{1}{a+be^ce^{dx}}\right)\,dx}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b*exp(d*x+c))**2,x)
```

```
[Out] x/(a**2*d + a*b*d*exp(c + d*x)) + (Integral(d*x/(a + b*exp(c)*exp
(d*x)), x) + Integral(-1/(a + b*exp(c)*exp(d*x)), x))/(a*d)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\left(be^{(dx+c)} + a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.12 $\int \frac{1}{\left(a+be^{c+dx}\right)^2}\,dx$

Optimal. Leaf size=46

$$-\frac{\log\left(a+be^{c+dx}\right)}{a^2d}+\frac{x}{a^2}+\frac{1}{ad\left(a+be^{c+dx}\right)}$$

```
[Out] 1/(a*d*(a + b*E^(c + d*x))) + x/a^2 - Log[a + b*E^(c + d*x)]/(a^2
*d)
```

Rubi [A] time = 0.0647441, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{\log\left(a+be^{c+dx}\right)}{a^2d}+\frac{x}{a^2}+\frac{1}{ad\left(a+be^{c+dx}\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*E^(c + d*x))^(-2),x]
```

```
[Out] 1/(a*d*(a + b*E^(c + d*x))) + x/a^2 - Log[a + b*E^(c + d*x)]/(a^2
*d)
```

Rubi in Sympy [A] time = 12.9474, size = 88, normalized size = 1.91

$$\frac{e^{-c-dx}e^{c+dx}}{ad\left(a+be^{c+dx}\right)}-\frac{e^{-c-dx}e^{c+dx}\log\left(a+be^{c+dx}\right)}{a^2d}+\frac{e^{-c-dx}e^{c+dx}\log\left(e^{c+dx}\right)}{a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*exp(d*x+c))**2,x)
```

```
[Out] exp(-c - d*x)*exp(c + d*x)/(a*d*(a + b*exp(c + d*x))) - exp(-c -
d*x)*exp(c + d*x)*log(a + b*exp(c + d*x))/(a**2*d) + exp(-c - d*x
)*exp(c + d*x)*log(exp(c + d*x))/(a**2*d)
```

Mathematica [A] time = 0.0577621, size = 41, normalized size = 0.89

$$\frac{\frac{a}{ad+bde^{c+dx}}-\frac{\log\left(a+be^{c+dx}\right)}{d}+x}{a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*E^(c + d*x))^(-2),x]
```

```
[Out] (a/(a*d + b*d*E^(c + d*x)) + x - Log[a + b*E^(c + d*x)]/d)/a^2
```

Maple [A] time = 0.003, size = 54, normalized size = 1.2

$$\frac{\ln\left(e^{dx+c}\right)}{da^2}-\frac{\ln\left(a+be^{dx+c}\right)}{da^2}+\frac{1}{ad\left(a+be^{dx+c}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/d/a^2*ln(exp(d*x+c))-ln(a+b*exp(d*x+c))/a^2/d+1/a/d/(a+b*exp(d*
x+c))
```

Maxima [A] time = 0.862244, size = 69, normalized size = 1.5

$$\frac{1}{\left(abe^{(dx+c)}+a^2\right)d}+\frac{dx+c}{a^2d}-\frac{\log\left(be^{(dx+c)}+a\right)}{a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.254929, size = 81, normalized size = 1.76

$$\frac{bdxe^{(dx+c)}+adx-\left(be^{(dx+c)}+a\right)\log\left(be^{(dx+c)}+a\right)+a}{a^2bde^{(dx+c)}+a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (b*d*x*e^(d*x + c) + a*d*x - (b*e^(d*x + c) + a)*log(b*e^(d*x + c
) + a) + a)/(a^2*b*d*e^(d*x + c) + a^3*d)
```

Sympy [A] time = 0.310755, size = 39, normalized size = 0.85

$$\frac{1}{a^2d + abde^{c+dx}} + \frac{x}{a^2} - \frac{\log\left(\frac{a}{b} + e^{c+dx}\right)}{a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/(a**2*d + a*b*d*exp(c + d*x)) + x/a**2 - log(a/b + exp(c + d*x)
)/(a**2*d)
```

GIAC/XCAS [A] time = 0.269408, size = 70, normalized size = 1.52

$$\frac{dx + c}{a^2d} - \frac{\ln\left(\left|be^{(dx+c)} + a\right|\right)}{a^2d} + \frac{1}{\left(be^{(dx+c)} + a\right)ad}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.13 $\int \frac{1}{\left(a+be^{c+dx}\right)^2 x} \, dx$

Optimal. Leaf size=20

$$\text{Int}\left(\frac{1}{x\left(a+be^{c+dx}\right)^2},x\right)$$

```
[Out] Unintegrable[1/((a + b*E^(c + d*x))^2*x), x]
```

Rubi [A] time = 0.0698353, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$

$$\text{Int}\left(\frac{1}{\left(a+be^{c+dx}\right)^2 x},x\right)$$

Verification is Not applicable to the result.

```
[In]  Int[1/((a + b*E^(c + d*x))^2*x),x]

[Out] Defer[Int][1/((a + b*E^(c + d*x))^2*x), x]
```

Rubi in Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x\left(a+be^{c+dx}\right)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*exp(d*x+c))**2/x,x)

[Out] Integral(1/(x*(a + b*exp(c + d*x))**2), x)
```

Mathematica [A] time = 0.859048, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+be^{c+dx}\right)^2 x} \, dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[1/((a + b*E^(c + d*x))^2*x),x]
```

```
[Out] Integrate[1/((a + b*E^(c + d*x))^2*x), x]
```

Maple [A] time = 0.041, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\mathrm{e}^{dx+c}\right)^{2}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int(1/(a+b*exp(d*x+c))^2/x,x)
```

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

$$\frac{1}{abdxe^{(dx+c)}+a^{2}dx}+\int \frac{dx+1}{abdx^{2}e^{(dx+c)}+a^{2}dx^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/(a*b*d*x*e^(d*x + c) + a^2*d*x) + integrate((d*x + 1)/(a*b*d*x^
2*e^(d*x + c) + a^2*d*x^2), x)
```

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

$$\mathrm{integral}\left(\frac{1}{b^{2}xe^{(2\,dx+2\,c)}+2\,abxe^{(dx+c)}+a^{2}x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\frac{1}{a^2dx + abdxe^{c+dx}} + \frac{\int \frac{dx}{ax^2+bx^2e^ce^{dx}}\,dx + \int \frac{1}{ax^2+bx^2e^ce^{dx}}\,dx}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/(a**2*d*x + a*b*d*x*exp(c + d*x)) + (Integral(d*x/(a*x**2 + b*x
**2*exp(c)*exp(d*x)), x) + Integral(1/(a*x**2 + b*x**2*exp(c)*exp
(d*x)), x))/(a*d)
```

GIAC/XCAS [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(be^{(dx+c)} + a\right)^2 x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(1/((b*e^(d*x + c) + a)^2*x), x)
```

3.14 $\int \frac{1}{\left(a+be^{c+dx}\right)^2 x^2}\,dx$

Optimal. Leaf size=20

$$\mathrm{Int}\left(\frac{1}{x^2\left(a+be^{c+dx}\right)^2},x\right)$$

```
[Out] Unintegrable[1/((a + b*E^(c + d*x))^2*x^2), x]
```

Rubi [A] time = 0.0659959, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$

$$\mathrm{Int}\left(\frac{1}{\left(a+be^{c+dx}\right)^2 x^2},x\right)$$

Verification is Not applicable to the result.

```
[In] Int[1/((a + b*E^(c + d*x))^2*x^2),x]

[Out] Defer[Int][1/((a + b*E^(c + d*x))^2*x^2), x]
```

Rubi in Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x^2\left(a+be^{c+dx}\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b*exp(d*x+c))**2/x**2,x)

[Out] Integral(1/(x**2*(a + b*exp(c + d*x))**2), x)
```

Mathematica [A] time = 0.748621, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+be^{c+dx}\right)^2 x^2}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[1/((a + b*E^(c + d*x))^2*x^2),x]
```

```
[Out] Integrate[1/((a + b*E^(c + d*x))^2*x^2), x]
```

Maple [A] time = 0.051, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int(1/(a+b*exp(d*x+c))^2/x^2,x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/(a*b*d*x^2*e^(d*x + c) + a^2*d*x^2) + integrate((d*x + 2)/(a*b*
d*x^3*e^(d*x + c) + a^2*d*x^3), x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\frac{1}{a^2dx^2 + abdx^2e^{c+dx}} + \frac{\int \frac{dx}{ax^3+bx^3e^ce^{dx}}\,dx + \int \frac{2}{ax^3+bx^3e^ce^{dx}}\,dx}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/(a**2*d*x**2 + a*b*d*x**2*exp(c + d*x)) + (Integral(d*x/(a*x**3
 + b*x**3*exp(c)*exp(d*x)), x) + Integral(2/(a*x**3 + b*x**3*exp(
c)*exp(d*x)), x))/(a*d)
```

GIAC/XCAS [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(be^{(dx+c)} + a\right)^2 x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(1/((b*e^(d*x + c) + a)^2*x^2), x)
```

3.15 $\int \frac{1}{\left(a+be^{c-dx}\right)^2}\,dx$

Optimal. Leaf size=48

$$\frac{\log\left(a+be^{c-dx}\right)}{a^2d}+\frac{x}{a^2}-\frac{1}{ad\left(a+be^{c-dx}\right)}$$

```
[Out] -(1/(a*d*(a + b*E^(c - d*x)))) + x/a^2 + Log[a + b*E^(c - d*x)]/(
a^2*d)
```

Rubi [A] time = 0.0659949, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{\log\left(a+be^{c-dx}\right)}{a^2d}+\frac{x}{a^2}-\frac{1}{ad\left(a+be^{c-dx}\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*E^(c - d*x))^(-2),x]
```

```
[Out] -(1/(a*d*(a + b*E^(c - d*x)))) + x/a^2 + Log[a + b*E^(c - d*x)]/(
a^2*d)
```

Rubi in Sympy [A] time = 14.0406, size = 83, normalized size = 1.73

$$-\frac{e^{-c+dx}e^{c-dx}}{ad\left(a+be^{c-dx}\right)}+\frac{e^{-c+dx}e^{c-dx}\log\left(a+be^{c-dx}\right)}{a^2d}-\frac{e^{-c+dx}e^{c-dx}\log\left(e^{c-dx}\right)}{a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*exp(-d*x+c))**2,x)
```

```
[Out] -exp(-c + d*x)*exp(c - d*x)/(a*d*(a + b*exp(c - d*x))) + exp(-c +
 d*x)*exp(c - d*x)*log(a + b*exp(c - d*x))/(a**2*d) - exp(-c + d*
x)*exp(c - d*x)*log(exp(c - d*x))/(a**2*d)
```

Mathematica [A] time = 0.0519499, size = 42, normalized size = 0.88

$$\frac{\frac{be^c}{ae^{dx}+be^c}+\log\left(ae^{dx}+be^c\right)}{a^2d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*E^(c - d*x))^(-2),x]
```

```
[Out] ((b*E^c)/(b*E^c + a*E^(d*x)) + Log[b*E^c + a*E^(d*x)])/(a^2*d)
```

Maple [A] time = 0.003, size = 58, normalized size = 1.2

$$-\frac{\ln\left(e^{-dx+c}\right)}{da^{2}}+\frac{\ln\left(a+be^{-dx+c}\right)}{da^{2}}-\frac{1}{ad\left(a+be^{-dx+c}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*exp(-d*x+c))^2,x)
```

```
[Out] -1/d/a^2*ln(exp(-d*x+c))+ln(a+b*exp(-d*x+c))/a^2/d-1/a/d/(a+b*exp
(-d*x+c))
```

Maxima [A] time = 0.789147, size = 74, normalized size = 1.54

$$-\frac{1}{\left(abe^{(-dx+c)}+a^{2}\right)d}+\frac{dx-c}{a^{2}d}+\frac{\log\left(be^{(-dx+c)}+a\right)}{a^{2}d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.274957, size = 88, normalized size = 1.83

$$\frac{bdxe^{(-dx+c)}+adx+\left(be^{(-dx+c)}+a\right)\log\left(be^{(-dx+c)}+a\right)-a}{a^{2}bde^{(-dx+c)}+a^{3}d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (b*d*x*e^(-d*x + c) + a*d*x + (b*e^(-d*x + c) + a)*log(b*e^(-d*x
+ c) + a) - a)/(a^2*b*d*e^(-d*x + c) + a^3*d)
```

Sympy [A] time = 0.318285, size = 39, normalized size = 0.81

$$-\frac{1}{a^2d + abde^{c-dx}} + \frac{x}{a^2} + \frac{\log\left(\frac{a}{b} + e^{c-dx}\right)}{a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*exp(-d*x+c))**2,x)
```

```
[Out] -1/(a**2*d + a*b*d*exp(c - d*x)) + x/a**2 + log(a/b + exp(c - d*x
))/(a**2*d)
```

GIAC/XCAS [A] time = 0.25544, size = 76, normalized size = 1.58

$$\frac{dx - c}{a^2d} + \frac{\ln\left(\left|be^{(-dx+c)} + a\right|\right)}{a^2d} - \frac{1}{\left(be^{(-dx+c)} + a\right)ad}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.16 $\int \frac{1}{\left(a+be^{-c-dx}\right)^2}\,dx$

Optimal. Leaf size=52

$$\frac{\log\left(a+be^{-c-dx}\right)}{a^2d}+\frac{x}{a^2}-\frac{1}{ad\left(a+be^{-c-dx}\right)}$$

```
[Out] -(1/(a*d*(a + b*E^(-c - d*x)))) + x/a^2 + Log[a + b*E^(-c - d*x)]
/(a^2*d)
```

Rubi [A] time = 0.0699595, antiderivative size = 52, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$\frac{\log\left(a+be^{-c-dx}\right)}{a^2d}+\frac{x}{a^2}-\frac{1}{ad\left(a+be^{-c-dx}\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*E^(-c - d*x))^(-2),x]
```

```
[Out] -(1/(a*d*(a + b*E^(-c - d*x)))) + x/a^2 + Log[a + b*E^(-c - d*x)]
/(a^2*d)
```

Rubi in Sympy [A] time = 13.867, size = 94, normalized size = 1.81

$$-\frac{e^{-c-dx}e^{c+dx}}{ad\left(a+be^{-c-dx}\right)}+\frac{e^{-c-dx}e^{c+dx}\log\left(a+be^{-c-dx}\right)}{a^2d}-\frac{e^{-c-dx}e^{c+dx}\log\left(e^{-c-dx}\right)}{a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*exp(-d*x-c))**2,x)
```

```
[Out] -exp(-c - d*x)*exp(c + d*x)/(a*d*(a + b*exp(-c - d*x))) + exp(-c
- d*x)*exp(c + d*x)*log(a + b*exp(-c - d*x))/(a**2*d) - exp(-c -
d*x)*exp(c + d*x)*log(exp(-c - d*x))/(a**2*d)
```

Mathematica [A] time = 0.0511566, size = 35, normalized size = 0.67

$$\frac{\frac{b}{ae^{c+dx}+b}+\log\left(ae^{c+dx}+b\right)}{a^2d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*E^(-c - d*x))^(-2),x]
```

```
[Out] (b/(b + a*E^(c + d*x)) + Log[b + a*E^(c + d*x)])/(a^2*d)
```

Maple [A]   time = 0.003, size = 64, normalized size = 1.2

$$-\frac{\ln\left(e^{-dx-c}\right)}{da^2}+\frac{\ln\left(a+be^{-dx-c}\right)}{da^2}-\frac{1}{ad\left(a+be^{-dx-c}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*exp(-d*x-c))^2,x)
```

```
[Out] -1/d/a^2*ln(exp(-d*x-c))+ln(a+b*exp(-d*x-c))/a^2/d-1/a/d/(a+b*exp
(-d*x-c))
```

Maxima [A]   time = 0.861881, size = 77, normalized size = 1.48

$$-\frac{1}{\left(abe^{(-dx-c)}+a^2\right)d}+\frac{dx+c}{a^2d}+\frac{\log\left(be^{(-dx-c)}+a\right)}{a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A]   time = 0.259679, size = 99, normalized size = 1.9

$$\frac{bdxe^{(-dx-c)}+adx+\left(be^{(-dx-c)}+a\right)\log\left(be^{(-dx-c)}+a\right)-a}{a^2bde^{(-dx-c)}+a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (b*d*x*e^(-d*x - c) + a*d*x + (b*e^(-d*x - c) + a)*log(b*e^(-d*x
- c) + a) - a)/(a^2*b*d*e^(-d*x - c) + a^3*d)
```

Sympy [A] time = 0.334785, size = 42, normalized size = 0.81

$$-\frac{1}{a^2d + abde^{-c-dx}} + \frac{x}{a^2} + \frac{\log\left(\frac{a}{b} + e^{-c-dx}\right)}{a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*exp(-d*x-c))**2,x)
```

```
[Out] -1/(a**2*d + a*b*d*exp(-c - d*x)) + x/a**2 + log(a/b + exp(-c - d
*x))/(a**2*d)
```

GIAC/XCAS [A] time = 0.256108, size = 78, normalized size = 1.5

$$\frac{dx + c}{a^2d} + \frac{\ln\left(\left|be^{(-dx-c)} + a\right|\right)}{a^2d} - \frac{1}{\left(be^{(-dx-c)} + a\right)ad}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.17 $\int \frac{x^3}{\left(a+be^{c+dx}\right)^3}\,dx$

Optimal. Leaf size=333

$$-\frac{3\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{a^3d^4}-\frac{9\text{PolyLog}\left(3,-\frac{be^{c+dx}}{a}\right)}{a^3d^4}-\frac{6\text{PolyLog}\left(4,-\frac{be^{c+dx}}{a}\right)}{a^3d^4}+\frac{9x\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{a^3d^3}+\frac{6x\text{PolyLog}\left(3,-\frac{be^{c+dx}}{a}\right)}{a^3d^3}-\frac{3x^2\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{a^3d^2}-\frac{3x\log\left(\frac{be^{c+dx}}{a}+1\right)}{a^3d^3}+\frac{9x^2\log\left(\frac{be^{c+dx}}{a}+1\right)}{2a^3d^2}-\frac{x^3\log\left(\frac{be^{c+dx}}{a}+1\right)}{a^3d}+\frac{3x^2}{2a^3d^2}-\frac{3x^3}{2a^3d}+\frac{x^4}{4a^3}-\frac{3x^2}{2a^2d^2\left(a+be^{c+dx}\right)}+\frac{x^3}{a^2d\left(a+be^{c+dx}\right)}+\frac{x^3}{2ad\left(a+be^{c+dx}\right)^2}$$

```
[Out] (3*x^2)/(2*a^3*d^2) - (3*x^2)/(2*a^2*d^2*(a + b*E^(c + d*x))) - (
3*x^3)/(2*a^3*d) + x^3/(2*a*d*(a + b*E^(c + d*x))^2) + x^3/(a^2*d
*(a + b*E^(c + d*x))) + x^4/(4*a^3) - (3*x*Log[1 + (b*E^(c + d*x)
)/a])/(a^3*d^3) + (9*x^2*Log[1 + (b*E^(c + d*x))/a])/(2*a^3*d^2)
- (x^3*Log[1 + (b*E^(c + d*x))/a])/(a^3*d) - (3*PolyLog[2, -((b*E
^(c + d*x))/a)])/(a^3*d^4) + (9*x*PolyLog[2, -((b*E^(c + d*x))/a)
])/(a^3*d^3) - (3*x^2*PolyLog[2, -((b*E^(c + d*x))/a)])/(a^3*d^2)
 - (9*PolyLog[3, -((b*E^(c + d*x))/a)])/(a^3*d^4) + (6*x*PolyLog[
3, -((b*E^(c + d*x))/a)])/(a^3*d^3) - (6*PolyLog[4, -((b*E^(c + d
*x))/a)])/(a^3*d^4)
```

Rubi [A] time = 1.69361, antiderivative size = 333, normalized size of antiderivative = 1., number of steps used = 26, number of rules used = 10, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.588

$$-\frac{3\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{a^3d^4}-\frac{9\text{PolyLog}\left(3,-\frac{be^{c+dx}}{a}\right)}{a^3d^4}-\frac{6\text{PolyLog}\left(4,-\frac{be^{c+dx}}{a}\right)}{a^3d^4}+\frac{9x\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{a^3d^3}+\frac{6x\text{PolyLog}\left(3,-\frac{be^{c+dx}}{a}\right)}{a^3d^3}-\frac{3x^2\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{a^3d^2}-\frac{3x\log\left(\frac{be^{c+dx}}{a}+1\right)}{a^3d^3}+\frac{9x^2\log\left(\frac{be^{c+dx}}{a}+1\right)}{2a^3d^2}-\frac{x^3\log\left(\frac{be^{c+dx}}{a}+1\right)}{a^3d}+\frac{3x^2}{2a^3d^2}-\frac{3x^3}{2a^3d}+\frac{x^4}{4a^3}-\frac{3x^2}{2a^2d^2\left(a+be^{c+dx}\right)}+\frac{x^3}{a^2d\left(a+be^{c+dx}\right)}+\frac{x^3}{2ad\left(a+be^{c+dx}\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b*E^(c + d*x))^3,x]
```

```
[Out] (3*x^2)/(2*a^3*d^2) - (3*x^2)/(2*a^2*d^2*(a + b*E^(c + d*x))) - (
3*x^3)/(2*a^3*d) + x^3/(2*a*d*(a + b*E^(c + d*x))^2) + x^3/(a^2*d
*(a + b*E^(c + d*x))) + x^4/(4*a^3) - (3*x*Log[1 + (b*E^(c + d*x)
)/a])/(a^3*d^3) + (9*x^2*Log[1 + (b*E^(c + d*x))/a])/(2*a^3*d^2)
- (x^3*Log[1 + (b*E^(c + d*x))/a])/(a^3*d) - (3*PolyLog[2, -((b*E
^(c + d*x))/a)])/(a^3*d^4) + (9*x*PolyLog[2, -((b*E^(c + d*x))/a)
])/(a^3*d^3) - (3*x^2*PolyLog[2, -((b*E^(c + d*x))/a)])/(a^3*d^2)
 - (9*PolyLog[3, -((b*E^(c + d*x))/a)])/(a^3*d^4) + (6*x*PolyLog[
3, -((b*E^(c + d*x))/a)])/(a^3*d^3) - (6*PolyLog[4, -((b*E^(c + d
*x))/a)])/(a^3*d^4)
```

Rubi in Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: PolificationFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b*exp(d*x+c))**3,x)
```

```
[Out] Exception raised: PolificationFailed
```

Mathematica [A] time = 0.304879, size = 241, normalized size = 0.72

$$\frac{\frac{12(2dx-3)\text{PolyLog}\left(3,-\frac{be^{c+dx}}{a}\right)}{d^4}-\frac{24\text{PolyLog}\left(4,-\frac{be^{c+dx}}{a}\right)}{d^4}-\frac{12\left(d^2x^2-3dx+1\right)\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{d^4}+\frac{2a^2x^3}{d\left(a+be^{c+dx}\right)^2}-\frac{12x\log\left(\frac{be^{c+dx}}{a}+1\right)}{d^3}}{4a^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + b*E^(c + d*x))^3,x]
```

```
[Out] ((6*x^2)/d^2 - (6*a*x^2)/(d^2*(a + b*E^(c + d*x))) - (6*x^3)/d +
(2*a^2*x^3)/(d*(a + b*E^(c + d*x))^2) + (4*a*x^3)/(a*d + b*d*E^(c
 + d*x)) + x^4 - (12*x*Log[1 + (b*E^(c + d*x))/a])/d^3 + (18*x^2*
Log[1 + (b*E^(c + d*x))/a])/d^2 - (4*x^3*Log[1 + (b*E^(c + d*x))/
a])/d - (12*(1 - 3*d*x + d^2*x^2)*PolyLog[2, -((b*E^(c + d*x))/a)
])/d^4 + (12*(-3 + 2*d*x)*PolyLog[3, -((b*E^(c + d*x))/a)])/d^4 -
 (24*PolyLog[4, -((b*E^(c + d*x))/a)])/d^4)/(4*a^3)
```

Maple [A] time = 0.089, size = 548, normalized size = 1.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^3/(a+b*exp(d*x+c))^3,x)
```

```
[Out] 1/4*x^4/a^3+3/4/a^3/d^4*c^4+3/a^3/d^4*c^3+3/2/a^3/d^4*c^2-1/a^3/d
^4*ln(1+b*exp(d*x+c)/a)*c^3-9/2/a^3/d^4*ln(1+b*exp(d*x+c)/a)*c^2-
9/2/a^3/d^4*c^2*ln(exp(d*x+c))+9/2/a^3/d^4*c^2*ln(a+b*exp(d*x+c))
-1/a^3/d^4*c^3*ln(exp(d*x+c))-3/a^3/d^4*c*ln(exp(d*x+c))+3/a^3/d^
4*c*ln(a+b*exp(d*x+c))+1/a^3/d^4*c^3*ln(a+b*exp(d*x+c))+3/a^3/d^3
*c*x+1/a^3/d^3*c^3*x+9/2/a^3/d^3*c^2*x-3/a^3/d^4*ln(1+b*exp(d*x+c
)/a)*c+3/2*x^2/a^3/d^2-3/2*x^3/a^3/d-3*polylog(2,-b*exp(d*x+c)/a)
/a^3/d^4-9*polylog(3,-b*exp(d*x+c)/a)/a^3/d^4-6*polylog(4,-b*exp(
d*x+c)/a)/a^3/d^4-3*x*ln(1+b*exp(d*x+c)/a)/a^3/d^3+9/2*x^2*ln(1+b
*exp(d*x+c)/a)/a^3/d^2-x^3*ln(1+b*exp(d*x+c)/a)/a^3/d+9*x*polylog
(2,-b*exp(d*x+c)/a)/a^3/d^3-3*x^2*polylog(2,-b*exp(d*x+c)/a)/a^3/
d^2+6*x*polylog(3,-b*exp(d*x+c)/a)/a^3/d^3+1/2*x^2*(2*x*b*d*exp(d
*x+c)+3*x*d*a-3*b*exp(d*x+c)-3*a)/d^2/a^2/(a+b*exp(d*x+c))^2
```

Maxima [A] time = 0.866038, size = 409, normalized size = 1.23

$$\frac{3\,adx^3 - 3\,ax^2 + \left(2\,bdx^3e^c - 3\,bx^2e^c\right)e^{(dx)}}{2\left(a^2b^2d^2e^{(2\,dx+2\,c)} + 2\,a^3bd^2e^{(dx+c)} + a^4d^2\right)} + \frac{d^4x^4 - 6\,d^3x^3 + 6\,d^2x^2}{4\,a^3d^4} - \frac{d^3x^3\log\left(\frac{be^{(dx+c)}}{a} + 1\right) + 3\,d^2x^2\mathrm{Li}_2\left(-\frac{be^{(dx+c)}}{a}\right) - 6\,dx\mathrm{Li}_3(-\frac{be^{(dx+c)}}{a}) + 6\,\mathrm{Li}_4(-\frac{be^{(dx+c)}}{a})}{a^3d^4} + \frac{9\left(d^2x^2\log\left(\frac{be^{(dx+c)}}{a} + 1\right) + 2\,dx\mathrm{Li}_2\left(-\frac{be^{(dx+c)}}{a}\right) - 2\,\mathrm{Li}_3(-\frac{be^{(dx+c)}}{a})\right)}{2\,a^3d^4} - \frac{3\left(dx\log\left(\frac{be^{(dx+c)}}{a} + 1\right) + \mathrm{Li}_2\left(-\frac{be^{(dx+c)}}{a}\right)\right)}{a^3d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*(3*a*d*x^3 - 3*a*x^2 + (2*b*d*x^3*e^c - 3*b*x^2*e^c)*e^(d*x))
/(a^2*b^2*d^2*e^(2*d*x + 2*c) + 2*a^3*b*d^2*e^(d*x + c) + a^4*d^2
) + 1/4*(d^4*x^4 - 6*d^3*x^3 + 6*d^2*x^2)/(a^3*d^4) - (d^3*x^3*lo
g(b*e^(d*x + c)/a + 1) + 3*d^2*x^2*dilog(-b*e^(d*x + c)/a) - 6*d*
x*polylog(3, -b*e^(d*x + c)/a) + 6*polylog(4, -b*e^(d*x + c)/a))/
(a^3*d^4) + 9/2*(d^2*x^2*log(b*e^(d*x + c)/a + 1) + 2*d*x*dilog(-
b*e^(d*x + c)/a) - 2*polylog(3, -b*e^(d*x + c)/a))/(a^3*d^4) - 3*
(d*x*log(b*e^(d*x + c)/a + 1) + dilog(-b*e^(d*x + c)/a))/(a^3*d^4
)
```

Fricas [A] time = 0.256813, size = 948, normalized size = 2.85

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*(a^2*d^4*x^4 - a^2*c^4 - 6*a^2*c^3 - 6*a^2*c^2 - 12*(a^2*d^2*
x^2 - 3*a^2*d*x + a^2 + (b^2*d^2*x^2 - 3*b^2*d*x + b^2)*e^(2*d*x
+ 2*c) + 2*(a*b*d^2*x^2 - 3*a*b*d*x + a*b)*e^(d*x + c))*dilog(-(b
*e^(d*x + c) + a)/a + 1) + (b^2*d^4*x^4 - 6*b^2*d^3*x^3 - b^2*c^4
 + 6*b^2*d^2*x^2 - 6*b^2*c^3 - 6*b^2*c^2)*e^(2*d*x + 2*c) + 2*(a*
b*d^4*x^4 - 4*a*b*d^3*x^3 - a*b*c^4 + 3*a*b*d^2*x^2 - 6*a*b*c^3 -
 6*a*b*c^2)*e^(d*x + c) + 2*(2*a^2*c^3 + 9*a^2*c^2 + 6*a^2*c + (2
*b^2*c^3 + 9*b^2*c^2 + 6*b^2*c)*e^(2*d*x + 2*c) + 2*(2*a*b*c^3 +
9*a*b*c^2 + 6*a*b*c)*e^(d*x + c))*log(b*e^(d*x + c) + a) - 2*(2*a
^2*d^3*x^3 - 9*a^2*d^2*x^2 + 2*a^2*c^3 + 9*a^2*c^2 + 6*a^2*d*x +
6*a^2*c + (2*b^2*d^3*x^3 - 9*b^2*d^2*x^2 + 2*b^2*c^3 + 9*b^2*c^2
+ 6*b^2*d*x + 6*b^2*c)*e^(2*d*x + 2*c) + 2*(2*a*b*d^3*x^3 - 9*a*b
*d^2*x^2 + 2*a*b*c^3 + 9*a*b*c^2 + 6*a*b*d*x + 6*a*b*c)*e^(d*x +
c))*log((b*e^(d*x + c) + a)/a) - 24*(b^2*e^(2*d*x + 2*c) + 2*a*b*
e^(d*x + c) + a^2)*polylog(4, -b*e^(d*x + c)/a) + 12*(2*a^2*d*x -
 3*a^2 + (2*b^2*d*x - 3*b^2)*e^(2*d*x + 2*c) + 2*(2*a*b*d*x - 3*a
*b)*e^(d*x + c))*polylog(3, -b*e^(d*x + c)/a))/(a^3*b^2*d^4*e^(2*
d*x + 2*c) + 2*a^4*b*d^4*e^(d*x + c) + a^5*d^4)
```

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

$$\frac{3adx^3 - 3ax^2 + \left(2bdx^3 - 3bx^2\right)e^{c+dx}}{2a^4d^2 + 4a^3bd^2e^{c+dx} + 2a^2b^2d^2e^{2c+2dx}} + \frac{\int \frac{6x}{a+be^ce^{dx}}\,dx + \int \left(-\frac{9dx^2}{a+be^ce^{dx}}\right)dx + \int \frac{2d^2x^3}{a+be^ce^{dx}}\,dx}{2a^2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b*exp(d*x+c))**3,x)
```

```
[Out] (3*a*d*x**3 - 3*a*x**2 + (2*b*d*x**3 - 3*b*x**2)*exp(c + d*x))/(2
*a**4*d**2 + 4*a**3*b*d**2*exp(c + d*x) + 2*a**2*b**2*d**2*exp(2*
c + 2*d*x)) + (Integral(6*x/(a + b*exp(c)*exp(d*x)), x) + Integra
l(-9*d*x**2/(a + b*exp(c)*exp(d*x)), x) + Integral(2*d**2*x**3/(a
 + b*exp(c)*exp(d*x)), x))/(2*a**2*d**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{\left(be^{(dx+c)} + a\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.18 $\int \frac{x^2}{\left(a+be^{c+dx}\right)^3}\,dx$

Optimal. Leaf size=243

$$\frac{3\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{a^3d^3}+\frac{2\text{PolyLog}\left(3,-\frac{be^{c+dx}}{a}\right)}{a^3d^3}-\frac{2x\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{a^3d^2}-\frac{\log\left(a+be^{c+dx}\right)}{a^3d^3}+\frac{3x\log\left(\frac{be^{c+dx}}{a}+1\right)}{a^3d^2}-\frac{x^2\log\left(\frac{be^{c+dx}}{a}+1\right)}{a^3d}+\frac{x}{a^3d^2}-\frac{3x^2}{2a^3d}+\frac{x^3}{3a^3}-\frac{x}{a^2d^2\left(a+be^{c+dx}\right)}+\frac{x^2}{a^2d\left(a+be^{c+dx}\right)}+\frac{x^2}{2ad\left(a+be^{c+dx}\right)^2}$$

```
[Out] x/(a^3*d^2) - x/(a^2*d^2*(a + b*E^(c + d*x))) - (3*x^2)/(2*a^3*d)
 + x^2/(2*a*d*(a + b*E^(c + d*x))^2) + x^2/(a^2*d*(a + b*E^(c + d
*x))) + x^3/(3*a^3) - Log[a + b*E^(c + d*x)]/(a^3*d^3) + (3*x*Log
[1 + (b*E^(c + d*x))/a])/(a^3*d^2) - (x^2*Log[1 + (b*E^(c + d*x))
/a])/(a^3*d) + (3*PolyLog[2, -((b*E^(c + d*x))/a)])/(a^3*d^3) - (
2*x*PolyLog[2, -((b*E^(c + d*x))/a)])/(a^3*d^2) + (2*PolyLog[3, -
((b*E^(c + d*x))/a)])/(a^3*d^3)
```

Rubi [A] time = 1.19326, antiderivative size = 243, normalized size of antiderivative = 1., number of steps used = 23, number of rules used = 12, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.706

$$\frac{3\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{a^3d^3}+\frac{2\text{PolyLog}\left(3,-\frac{be^{c+dx}}{a}\right)}{a^3d^3}-\frac{2x\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{a^3d^2}-\frac{\log\left(a+be^{c+dx}\right)}{a^3d^3}+\frac{3x\log\left(\frac{be^{c+dx}}{a}+1\right)}{a^3d^2}-\frac{x^2\log\left(\frac{be^{c+dx}}{a}+1\right)}{a^3d}+\frac{x}{a^3d^2}-\frac{3x^2}{2a^3d}+\frac{x^3}{3a^3}-\frac{x}{a^2d^2\left(a+be^{c+dx}\right)}+\frac{x^2}{a^2d\left(a+be^{c+dx}\right)}+\frac{x^2}{2ad\left(a+be^{c+dx}\right)^2}$$

Antiderivative was successfully verified.

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

```
[Out] x/(a^3*d^2) - x/(a^2*d^2*(a + b*E^(c + d*x))) - (3*x^2)/(2*a^3*d)
 + x^2/(2*a*d*(a + b*E^(c + d*x))^2) + x^2/(a^2*d*(a + b*E^(c + d
*x))) + x^3/(3*a^3) - Log[a + b*E^(c + d*x)]/(a^3*d^3) + (3*x*Log
[1 + (b*E^(c + d*x))/a])/(a^3*d^2) - (x^2*Log[1 + (b*E^(c + d*x))
/a])/(a^3*d) + (3*PolyLog[2, -((b*E^(c + d*x))/a)])/(a^3*d^3) - (
2*x*PolyLog[2, -((b*E^(c + d*x))/a)])/(a^3*d^2) + (2*PolyLog[3, -
((b*E^(c + d*x))/a)])/(a^3*d^3)
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b*exp(d*x+c))**3,x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.229566, size = 203, normalized size = 0.84

$$\frac{-\frac{6(2dx-3)\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{d^3}+\frac{12\text{PolyLog}\left(3,-\frac{be^{c+dx}}{a}\right)}{d^3}+\frac{3a^2x^2}{d\left(a+be^{c+dx}\right)^2}-\frac{6\log\left(\frac{be^{c+dx}}{a}+1\right)}{d^3}-\frac{6ax}{d^2\left(a+be^{c+dx}\right)}+\frac{18x\log\left(\frac{be^{c+dx}}{a}+1\right)}{d^2}+\cdots}{6a^3}$$

Antiderivative was successfully verified.

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

```
[Out] ((6*x)/d^2 - (6*a*x)/(d^2*(a + b*E^(c + d*x))) - (9*x^2)/d + (3*a
^2*x^2)/(d*(a + b*E^(c + d*x))^2) + (6*a*x^2)/(a*d + b*d*E^(c + d
*x)) + 2*x^3 - (6*Log[1 + (b*E^(c + d*x))/a])/d^3 + (18*x*Log[1 +
 (b*E^(c + d*x))/a])/d^2 - (6*x^2*Log[1 + (b*E^(c + d*x))/a])/d -
 (6*(-3 + 2*d*x)*PolyLog[2, -((b*E^(c + d*x))/a)])/d^3 + (12*Poly
Log[3, -((b*E^(c + d*x))/a)])/d^3)/(6*a^3)
```

Maple [A] time = 0.078, size = 385, normalized size = 1.6

$$\frac{\left(2\,xbd\mathrm{e}^{dx+c}+3\,xda-2\,b\mathrm{e}^{dx+c}-2\,a\right)x}{2\,d^2a^2\left(a+b\mathrm{e}^{dx+c}\right)^2}+\frac{\ln\left(\mathrm{e}^{dx+c}\right)}{a^3d^3}-\frac{\ln\left(a+b\mathrm{e}^{dx+c}\right)}{a^3d^3}$$
$$+\frac{c^2\ln\left(\mathrm{e}^{dx+c}\right)}{a^3d^3}-\frac{c^2\ln\left(a+b\mathrm{e}^{dx+c}\right)}{a^3d^3}+\frac{x^3}{3\,a^3}-\frac{c^2x}{a^3d^2}-\frac{2\,c^3}{3\,a^3d^3}-\frac{x^2}{a^3d}\ln\left(1+\frac{b\mathrm{e}^{dx+c}}{a}\right)$$
$$+\frac{c^2}{a^3d^3}\ln\left(1+\frac{b\mathrm{e}^{dx+c}}{a}\right)-2\,\frac{x}{a^3d^2}polylog\left(2,-\frac{b\mathrm{e}^{dx+c}}{a}\right)+2\,\frac{1}{a^3d^3}polylog\left(3,-\frac{b\mathrm{e}^{dx+c}}{a}\right)$$
$$+3\,\frac{c\ln\left(\mathrm{e}^{dx+c}\right)}{a^3d^3}-3\,\frac{c\ln\left(a+b\mathrm{e}^{dx+c}\right)}{a^3d^3}-\frac{3\,x^2}{2\,a^3d}-3\,\frac{xc}{a^3d^2}-\frac{3\,c^2}{2\,a^3d^3}$$
$$+3\,\frac{x}{a^3d^2}\ln\left(1+\frac{b\mathrm{e}^{dx+c}}{a}\right)+3\,\frac{c}{a^3d^3}\ln\left(1+\frac{b\mathrm{e}^{dx+c}}{a}\right)+3\,\frac{1}{a^3d^3}polylog\left(2,-\frac{b\mathrm{e}^{dx+c}}{a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*x*(2*x*b*d*exp(d*x+c)+3*x*d*a-2*b*exp(d*x+c)-2*a)/d^2/a^2/(a+
b*exp(d*x+c))^2+1/a^3/d^3*ln(exp(d*x+c))-ln(a+b*exp(d*x+c))/a^3/d
^3+1/a^3/d^3*c^2*ln(exp(d*x+c))-1/a^3/d^3*c^2*ln(a+b*exp(d*x+c))+
1/3*x^3/a^3-1/a^3/d^2*c^2*x-2/3/a^3/d^3*c^3-x^2*ln(1+b*exp(d*x+c)
/a)/a^3/d+1/a^3/d^3*ln(1+b*exp(d*x+c)/a)*c^2-2*x*polylog(2,-b*exp
(d*x+c)/a)/a^3/d^2+2*polylog(3,-b*exp(d*x+c)/a)/a^3/d^3+3/a^3/d^3
*c*ln(exp(d*x+c))-3/a^3/d^3*c*ln(a+b*exp(d*x+c))-3/2*x^2/a^3/d-3/
a^3/d^2*c*x-3/2/a^3/d^3*c^2+3*x*ln(1+b*exp(d*x+c)/a)/a^3/d^2+3/a^
3/d^3*ln(1+b*exp(d*x+c)/a)*c+3*polylog(2,-b*exp(d*x+c)/a)/a^3/d^3
```

Maxima [A] time = 0.981267, size = 316, normalized size = 1.3

$$\frac{3\,adx^2-2\,ax+2\left(bdx^2e^c-bxe^c\right)e^{(dx)}}{2\left(a^2b^2d^2e^{(2\,dx+2\,c)}+2\,a^3bd^2e^{(dx+c)}+a^4d^2\right)}+\frac{x}{a^3d^2}+\frac{2\,d^3x^3-9\,d^2x^2}{6\,a^3d^3}-\frac{d^2x^2\log\left(\frac{be^{(dx+c)}}{a}+1\right)+2\,dx\mathrm{Li}_2\left(-\frac{be^{(dx+c)}}{a}\right)-2\,\mathrm{Li}_3\left(-\frac{be^{(dx+c)}}{a}\right)}{a^3d^3}+\frac{3\left(dx\log\left(\frac{be^{(dx+c)}}{a}+1\right)+\mathrm{Li}_2\left(-\frac{be^{(dx+c)}}{a}\right)\right)}{a^3d^3}-\frac{\log\left(be^{(dx+c)}+a\right)}{a^3d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*(3*a*d*x^2 - 2*a*x + 2*(b*d*x^2*e^c - b*x*e^c)*e^(d*x))/(a^2*
b^2*d^2*e^(2*d*x + 2*c) + 2*a^3*b*d^2*e^(d*x + c) + a^4*d^2) + x/
(a^3*d^2) + 1/6*(2*d^3*x^3 - 9*d^2*x^2)/(a^3*d^3) - (d^2*x^2*log(
b*e^(d*x + c)/a + 1) + 2*d*x*dilog(-b*e^(d*x + c)/a) - 2*polylog(
3, -b*e^(d*x + c)/a))/(a^3*d^3) + 3*(d*x*log(b*e^(d*x + c)/a + 1)
 + dilog(-b*e^(d*x + c)/a))/(a^3*d^3) - log(b*e^(d*x + c) + a)/(a
^3*d^3)
```

Fricas [A] time = 0.270182, size = 703, normalized size = 2.89

$$2\,a^2d^3x^3+2\,a^2c^3+9\,a^2c^2+6\,a^2c-6\left(2\,a^2dx-3\,a^2+\left(2\,b^2dx-3\,b^2\right)e^{(2\,dx+2\,c)}+2\,(2\,abdx-3\,ab)e^{(dx+c)}\right)\mathrm{Li}_2\left(-\frac{be^{(dx+c)}+a}{a}+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/6*(2*a^2*d^3*x^3 + 2*a^2*c^3 + 9*a^2*c^2 + 6*a^2*c - 6*(2*a^2*d
*x - 3*a^2 + (2*b^2*d*x - 3*b^2)*e^(2*d*x + 2*c) + 2*(2*a*b*d*x -
 3*a*b)*e^(d*x + c))*dilog(-(b*e^(d*x + c) + a)/a + 1) + (2*b^2*d
^3*x^3 - 9*b^2*d^2*x^2 + 2*b^2*c^3 + 9*b^2*c^2 + 6*b^2*d*x + 6*b^
2*c)*e^(2*d*x + 2*c) + 2*(2*a*b*d^3*x^3 - 6*a*b*d^2*x^2 + 2*a*b*c
^3 + 9*a*b*c^2 + 3*a*b*d*x + 6*a*b*c)*e^(d*x + c) - 6*(a^2*c^2 +
3*a^2*c + a^2 + (b^2*c^2 + 3*b^2*c + b^2)*e^(2*d*x + 2*c) + 2*(a*
b*c^2 + 3*a*b*c + a*b)*e^(d*x + c))*log(b*e^(d*x + c) + a) - 6*(a
^2*d^2*x^2 - a^2*c^2 - 3*a^2*d*x - 3*a^2*c + (b^2*d^2*x^2 - b^2*c
^2 - 3*b^2*d*x - 3*b^2*c)*e^(2*d*x + 2*c) + 2*(a*b*d^2*x^2 - a*b*
c^2 - 3*a*b*d*x - 3*a*b*c)*e^(d*x + c))*log((b*e^(d*x + c) + a)/a
) + 12*(b^2*e^(2*d*x + 2*c) + 2*a*b*e^(d*x + c) + a^2)*polylog(3,
 -b*e^(d*x + c)/a))/(a^3*b^2*d^3*e^(2*d*x + 2*c) + 2*a^4*b*d^3*e^
(d*x + c) + a^5*d^3)
```

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

$$\frac{3adx^2 - 2ax + \left(2bdx^2 - 2bx\right)e^{c+dx}}{2a^4d^2 + 4a^3bd^2e^{c+dx} + 2a^2b^2d^2e^{2c+2dx}} + \frac{\int \left(-\frac{3dx}{a+be^ce^{dx}}\right)dx + \int \frac{d^2x^2}{a+be^ce^{dx}}\,dx + \int \frac{1}{a+be^ce^{dx}}\,dx}{a^2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (3*a*d*x**2 - 2*a*x + (2*b*d*x**2 - 2*b*x)*exp(c + d*x))/(2*a**4*
d**2 + 4*a**3*b*d**2*exp(c + d*x) + 2*a**2*b**2*d**2*exp(2*c + 2*
d*x)) + (Integral(-3*d*x/(a + b*exp(c)*exp(d*x)), x) + Integral(d
**2*x**2/(a + b*exp(c)*exp(d*x)), x) + Integral(1/(a + b*exp(c)*e
xp(d*x)), x))/(a**2*d**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.19 $\int \frac{x}{\left(a+be^{c+dx}\right)^3}\,dx$

Optimal. Leaf size=159

$$-\frac{\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{a^3d^2}+\frac{3\log\left(a+be^{c+dx}\right)}{2a^3d^2}-\frac{x\log\left(\frac{be^{c+dx}}{a}+1\right)}{a^3d}-\frac{3x}{2a^3d}+\frac{x^2}{2a^3}-\frac{1}{2a^2d^2\left(a+be^{c+dx}\right)}+\frac{x}{a^2d\left(a+be^{c+dx}\right)}+\frac{x}{2ad\left(a+be^{c+dx}\right)^2}$$

```
[Out] -1/(2*a^2*d^2*(a + b*E^(c + d*x))) - (3*x)/(2*a^3*d) + x/(2*a*d*(
a + b*E^(c + d*x))^2) + x/(a^2*d*(a + b*E^(c + d*x))) + x^2/(2*a^
3) + (3*Log[a + b*E^(c + d*x)])/(2*a^3*d^2) - (x*Log[1 + (b*E^(c
+ d*x))/a])/(a^3*d) - PolyLog[2, -((b*E^(c + d*x))/a)]/(a^3*d^2)
```

Rubi [A] time = 0.534349, antiderivative size = 159, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 11, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.733

$$-\frac{\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{a^3d^2}+\frac{3\log\left(a+be^{c+dx}\right)}{2a^3d^2}-\frac{x\log\left(\frac{be^{c+dx}}{a}+1\right)}{a^3d}-\frac{3x}{2a^3d}+\frac{x^2}{2a^3}-\frac{1}{2a^2d^2\left(a+be^{c+dx}\right)}+\frac{x}{a^2d\left(a+be^{c+dx}\right)}+\frac{x}{2ad\left(a+be^{c+dx}\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*E^(c + d*x))^3,x]
```

```
[Out] -1/(2*a^2*d^2*(a + b*E^(c + d*x))) - (3*x)/(2*a^3*d) + x/(2*a*d*(
a + b*E^(c + d*x))^2) + x/(a^2*d*(a + b*E^(c + d*x))) + x^2/(2*a^
3) + (3*Log[a + b*E^(c + d*x)])/(2*a^3*d^2) - (x*Log[1 + (b*E^(c
+ d*x))/a])/(a^3*d) - PolyLog[2, -((b*E^(c + d*x))/a)]/(a^3*d^2)
```

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

$$\frac{xe^{-c-dx}e^{c+dx}}{2ad\left(a+be^{c+dx}\right)^2}+\frac{xe^{-c-dx}e^{c+dx}}{a^2d\left(a+be^{c+dx}\right)}-\frac{1}{2a^2d^2\left(a+be^{c+dx}\right)}+\frac{\int x\,dx}{a^3}-\frac{xe^{-c-dx}e^{c+dx}\log\left(a+be^{c+dx}\right)}{a^3d}+\frac{xe^{-c-dx}e^{c+dx}\log\left(e^{c+dx}\right)}{a^3d}-\frac{x\log\left(1+\frac{be^{c+dx}}{a}\right)}{a^3d}+\frac{x\log\left(a+be^{c+dx}\right)}{a^3d}-\frac{x\log\left(e^{c+dx}\right)}{a^3d}+\frac{3\log\left(a+be^{c+dx}\right)}{2a^3d^2}-\frac{3\log\left(e^{c+dx}\right)}{2a^3d^2}-\frac{\text{Li}_2\left(-\frac{be^{c+dx}}{a}\right)}{a^3d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b*exp(d*x+c))**3,x)
```

```
[Out] x*exp(-c - d*x)*exp(c + d*x)/(2*a*d*(a + b*exp(c + d*x))**2) + x*
exp(-c - d*x)*exp(c + d*x)/(a**2*d*(a + b*exp(c + d*x))) - 1/(2*a
**2*d**2*(a + b*exp(c + d*x))) + Integral(x, x)/a**3 - x*exp(-c -
 d*x)*exp(c + d*x)*log(a + b*exp(c + d*x))/(a**3*d) + x*exp(-c -
d*x)*exp(c + d*x)*log(exp(c + d*x))/(a**3*d) - x*log(1 + b*exp(c
+ d*x)/a)/(a**3*d) + x*log(a + b*exp(c + d*x))/(a**3*d) - x*log(e
xp(c + d*x))/(a**3*d) + 3*log(a + b*exp(c + d*x))/(2*a**3*d**2) -
 3*log(exp(c + d*x))/(2*a**3*d**2) - polylog(2, -b*exp(c + d*x)/a
)/(a**3*d**2)
```

Mathematica [A] time = 0.182841, size = 120, normalized size = 0.75

$$\frac{\frac{dx\left(dx-2\log\left(\frac{be^{c+dx}}{a}+1\right)\right)-2\text{PolyLog}\left(2,-\frac{be^{c+dx}}{a}\right)}{a}+\frac{adx}{\left(a+be^{c+dx}\right)^2}+\frac{2dx-1}{a+be^{c+dx}}+\frac{3\log\left(\frac{be^{c+dx}}{a}+1\right)-3dx}{a}}{2a^2d^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b*E^(c + d*x))^3,x]
```

```
[Out] ((a*d*x)/(a + b*E^(c + d*x))^2 + (-1 + 2*d*x)/(a + b*E^(c + d*x))
 + (-3*d*x + 3*Log[1 + (b*E^(c + d*x))/a])/a + (d*x*(d*x - 2*Log[
1 + (b*E^(c + d*x))/a]) - 2*PolyLog[2, -((b*E^(c + d*x))/a)])/a)/
(2*a^2*d^2)
```

Maple [C] time = 0.036, size = 393, normalized size = 2.5

$$-\frac{1}{2\,a^2d^2\left(a+b\mathrm{e}^{dx+c}\right)}+\frac{3\,\ln\left(a+b\mathrm{e}^{dx+c}\right)}{2\,a^3d^2}-\frac{b^2\left(\mathrm{e}^{dx+c}\right)^2x}{2\,da^3\left(a+b\mathrm{e}^{dx+c}\right)^2}-\frac{b^2\left(\mathrm{e}^{dx+c}\right)^2c}{2\,a^3d^2\left(a+b\mathrm{e}^{dx+c}\right)^2}$$
$$-\frac{b\mathrm{e}^{dx+c}x}{da^2\left(a+b\mathrm{e}^{dx+c}\right)^2}-\frac{b\mathrm{e}^{dx+c}c}{a^2d^2\left(a+b\mathrm{e}^{dx+c}\right)^2}+\frac{x^2}{2\,a^3}+\frac{xc}{da^3}+\frac{c^2}{2\,a^3d^2}-\frac{b\mathrm{e}^{dx+c}x}{da^3\left(a+b\mathrm{e}^{dx+c}\right)}$$
$$-\frac{b\mathrm{e}^{dx+c}c}{a^3d^2\left(a+b\mathrm{e}^{dx+c}\right)}-\frac{1}{a^3d^2}\mathit{dilog}\left(\frac{a+b\mathrm{e}^{dx+c}}{a}\right)-\frac{x}{da^3}\ln\left(\frac{a+b\mathrm{e}^{dx+c}}{a}\right)-\frac{c}{a^3d^2}\ln\left(\frac{a+b\mathrm{e}^{dx+c}}{a}\right)$$
$$-\frac{c\ln\left(\mathrm{e}^{dx+c}\right)}{a^3d^2}+\frac{c\ln\left(a+b\mathrm{e}^{dx+c}\right)}{a^3d^2}-\frac{c}{a^2d^2\left(a+b\mathrm{e}^{dx+c}\right)}-\frac{c}{2\,d^2a\left(a+b\mathrm{e}^{dx+c}\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b*exp(d*x+c))^3,x)
```

```
[Out] -1/2/a^2/d^2/(a+b*exp(d*x+c))+3/2*ln(a+b*exp(d*x+c))/a^3/d^2-1/2/
d/a^3*b^2*exp(d*x+c)^2/(a+b*exp(d*x+c))^2*x-1/2/d^2/a^3*b^2*exp(d
*x+c)^2/(a+b*exp(d*x+c))^2*c-1/d/a^2*b*exp(d*x+c)/(a+b*exp(d*x+c)
)^2*x-1/d^2/a^2*b*exp(d*x+c)/(a+b*exp(d*x+c))^2*c+1/2*x^2/a^3+1/d
/a^3*x*c+1/2/d^2/a^3*c^2-1/d/a^3*b*exp(d*x+c)/(a+b*exp(d*x+c))*x-
1/d^2/a^3*b*exp(d*x+c)/(a+b*exp(d*x+c))*c-1/d^2/a^3*dilog((a+b*ex
p(d*x+c))/a)-1/d/a^3*ln((a+b*exp(d*x+c))/a)*x-1/d^2/a^3*ln((a+b*e
xp(d*x+c))/a)*c-1/d^2*c/a^3*ln(exp(d*x+c))+1/d^2*c/a^3*ln(a+b*exp
(d*x+c))-1/d^2*c/a^2/(a+b*exp(d*x+c))-1/2/d^2*c/a/(a+b*exp(d*x+c)
)^2
```

Maxima [A] time = 0.923559, size = 201, normalized size = 1.26

$$\frac{3\,adx + (2\,bdxe^{c} - be^{c})e^{(dx)} - a}{2\left(a^{2}b^{2}d^{2}e^{(2\,dx+2\,c)} + 2\,a^{3}bd^{2}e^{(dx+c)} + a^{4}d^{2}\right)} + \frac{x^{2}}{2\,a^{3}} - \frac{3\,x}{2\,a^{3}d} - \frac{dx\log\left(\frac{be^{(dx+c)}}{a} + 1\right) + \mathrm{Li}_2\left(-\frac{be^{(dx+c)}}{a}\right)}{a^{3}d^{2}} + \frac{3\,\log\left(be^{(dx+c)} + a\right)}{2\,a^{3}d^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*(3*a*d*x + (2*b*d*x*e^c - b*e^c)*e^(d*x) - a)/(a^2*b^2*d^2*e^
(2*d*x + 2*c) + 2*a^3*b*d^2*e^(d*x + c) + a^4*d^2) + 1/2*x^2/a^3
- 3/2*x/(a^3*d) - (d*x*log(b*e^(d*x + c)/a + 1) + dilog(-b*e^(d*x
 + c)/a))/(a^3*d^2) + 3/2*log(b*e^(d*x + c) + a)/(a^3*d^2)
```

Fricas [A] time = 0.255066, size = 456, normalized size = 2.87

$$a^{2}d^{2}x^{2} - a^{2}c^{2} - 3\,a^{2}c - a^{2} - 2\left(b^{2}e^{(2\,dx+2\,c)} + 2\,abe^{(dx+c)} + a^{2}\right)\mathrm{Li}_2\left(-\frac{be^{(dx+c)}+a}{a} + 1\right) + \left(b^{2}d^{2}x^{2} - b^{2}c^{2} - 3\,b^{2}dx - 3\,b^{2}c\right)e^{(2\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*(a^2*d^2*x^2 - a^2*c^2 - 3*a^2*c - a^2 - 2*(b^2*e^(2*d*x + 2*
c) + 2*a*b*e^(d*x + c) + a^2)*dilog(-(b*e^(d*x + c) + a)/a + 1) +
 (b^2*d^2*x^2 - b^2*c^2 - 3*b^2*d*x - 3*b^2*c)*e^(2*d*x + 2*c) +
(2*a*b*d^2*x^2 - 2*a*b*c^2 - 4*a*b*d*x - 6*a*b*c - a*b)*e^(d*x +
```

```
c) + (2*a^2*c + 3*a^2 + (2*b^2*c + 3*b^2)*e^(2*d*x + 2*c) + 2*(2*
a*b*c + 3*a*b)*e^(d*x + c))*log(b*e^(d*x + c) + a) - 2*(a^2*d*x +
 a^2*c + (b^2*d*x + b^2*c)*e^(2*d*x + 2*c) + 2*(a*b*d*x + a*b*c)*
e^(d*x + c))*log((b*e^(d*x + c) + a)/a))/(a^3*b^2*d^2*e^(2*d*x +
2*c) + 2*a^4*b*d^2*e^(d*x + c) + a^5*d^2)
```

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

$$\frac{3adx - a + (2bdx - b)\,e^{c+dx}}{2a^4d^2 + 4a^3bd^2e^{c+dx} + 2a^2b^2d^2e^{2c+2dx}} + \frac{\int \frac{2dx}{a+be^ce^{dx}}\,dx + \int \left(-\frac{3}{a+be^ce^{dx}}\right)\,dx}{2a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b*exp(d*x+c))**3,x)
```

```
[Out] (3*a*d*x - a + (2*b*d*x - b)*exp(c + d*x))/(2*a**4*d**2 + 4*a**3*
b*d**2*exp(c + d*x) + 2*a**2*b**2*d**2*exp(2*c + 2*d*x)) + (Integ
ral(2*d*x/(a + b*exp(c)*exp(d*x)), x) + Integral(-3/(a + b*exp(c)
*exp(d*x)), x))/(2*a**2*d)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\left(be^{(dx+c)} + a\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.20 $\int \frac{1}{\left(a+be^{c+dx}\right)^3}\,dx$

Optimal. Leaf size=69

$$-\frac{\log\left(a+be^{c+dx}\right)}{a^3d}+\frac{x}{a^3}+\frac{1}{a^2d\left(a+be^{c+dx}\right)}+\frac{1}{2ad\left(a+be^{c+dx}\right)^2}$$

```
[Out] 1/(2*a*d*(a + b*E^(c + d*x))^2) + 1/(a^2*d*(a + b*E^(c + d*x))) +
 x/a^3 - Log[a + b*E^(c + d*x)]/(a^3*d)
```

Rubi [A] time = 0.0847248, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{\log\left(a+be^{c+dx}\right)}{a^3d}+\frac{x}{a^3}+\frac{1}{a^2d\left(a+be^{c+dx}\right)}+\frac{1}{2ad\left(a+be^{c+dx}\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*E^(c + d*x))^(-3),x]
```

```
[Out] 1/(2*a*d*(a + b*E^(c + d*x))^2) + 1/(a^2*d*(a + b*E^(c + d*x))) +
 x/a^3 - Log[a + b*E^(c + d*x)]/(a^3*d)
```

Rubi in Sympy [A] time = 16.6242, size = 122, normalized size = 1.77

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*exp(d*x+c))**3,x)
```

```
[Out] exp(-c - d*x)*exp(c + d*x)/(2*a*d*(a + b*exp(c + d*x))**2) + exp(
-c - d*x)*exp(c + d*x)/(a**2*d*(a + b*exp(c + d*x))) - exp(-c - d
*x)*exp(c + d*x)*log(a + b*exp(c + d*x))/(a**3*d) + exp(-c - d*x)
*exp(c + d*x)*log(exp(c + d*x))/(a**3*d)
```

Mathematica [A] time = 0.117286, size = 69, normalized size = 1.

$$-\frac{\log\left(a+be^{c+dx}\right)}{a^3d}+\frac{x}{a^3}+\frac{1}{a^2d\left(a+be^{c+dx}\right)}+\frac{1}{2ad\left(a+be^{c+dx}\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*E^(c + d*x))^(-3),x]
```

```
[Out] 1/(2*a*d*(a + b*E^(c + d*x))^2) + 1/(a^2*d*(a + b*E^(c + d*x))) +
 x/a^3 - Log[a + b*E^(c + d*x)]/(a^3*d)
```

Maple [A] time = 0.001, size = 74, normalized size = 1.1

$$\frac{\ln\left(e^{dx+c}\right)}{da^3}-\frac{\ln\left(a+be^{dx+c}\right)}{da^3}+\frac{1}{a^2d\left(a+be^{dx+c}\right)}+\frac{1}{2\,ad\left(a+be^{dx+c}\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*exp(d*x+c))^3,x)
```

```
[Out] 1/d/a^3*ln(exp(d*x+c))-ln(a+b*exp(d*x+c))/a^3/d+1/a^2/d/(a+b*exp(
d*x+c))+1/2/a/d/(a+b*exp(d*x+c))^2
```

Maxima [A] time = 0.799186, size = 113, normalized size = 1.64

$$\frac{2\,be^{(dx+c)}+3\,a}{2\left(a^2b^2e^{(2\,dx+2\,c)}+2\,a^3be^{(dx+c)}+a^4\right)d}+\frac{dx+c}{a^3d}-\frac{\log\left(be^{(dx+c)}+a\right)}{a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.245999, size = 171, normalized size = 2.48

$$\frac{2\,b^2dxe^{(2\,dx+2\,c)} + 2\,a^2dx + 3\,a^2 + 2\,(2\,abdx + ab)e^{(dx+c)} - 2\left(b^2e^{(2\,dx+2\,c)} + 2\,abe^{(dx+c)} + a^2\right)\log\left(be^{(dx+c)} + a\right)}{2\left(a^3b^2de^{(2\,dx+2\,c)} + 2\,a^4bde^{(dx+c)} + a^5d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A] time = 0.39217, size = 76, normalized size = 1.1

$$\frac{3a + 2be^{c+dx}}{2a^4d + 4a^3bde^{c+dx} + 2a^2b^2de^{2c+2dx}} + \frac{x}{a^3} - \frac{\log\left(\frac{a}{b} + e^{c+dx}\right)}{a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*exp(d*x+c))**3,x)
```

```
[Out] (3*a + 2*b*exp(c + d*x))/(2*a**4*d + 4*a**3*b*d*exp(c + d*x) + 2*
a**2*b**2*d*exp(2*c + 2*d*x)) + x/a**3 - log(a/b + exp(c + d*x))/
(a**3*d)
```

GIAC/XCAS [A] time = 0.250399, size = 93, normalized size = 1.35

$$\frac{dx + c}{a^3d} - \frac{\ln\left(\left|be^{(dx+c)} + a\right|\right)}{a^3d} + \frac{2\,abe^{(dx+c)} + 3\,a^2}{2\left(be^{(dx+c)} + a\right)^2a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.21 $\int \frac{1}{\left(a+be^{c+dx}\right)^3 x} \, dx$

Optimal. Leaf size=20

$$\text{Int}\left(\frac{1}{x\left(a+be^{c+dx}\right)^3},x\right)$$

```
[Out] Unintegrable[1/((a + b*E^(c + d*x))^3*x), x]
```

Rubi [A] time = 0.0712577, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.

$$\text{Int}\left(\frac{1}{\left(a+be^{c+dx}\right)^3 x},x\right)$$

Verification is Not applicable to the result.

```
[In]  Int[1/((a + b*E^(c + d*x))^3*x),x]

[Out] Defer[Int][1/((a + b*E^(c + d*x))^3*x), x]
```

Rubi in Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x\left(a+be^{c+dx}\right)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*exp(d*x+c))**3/x,x)

[Out] Integral(1/(x*(a + b*exp(c + d*x))**3), x)
```

Mathematica [A] time = 0.983702, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+be^{c+dx}\right)^3 x} \, dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[1/((a + b*E^(c + d*x))^3*x),x]

[Out] Integrate[1/((a + b*E^(c + d*x))^3*x), x]
```

Maple [A] time = 0.055, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\mathrm{e}^{dx+c}\right)^{3} x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*exp(d*x+c))^3/x,x)

[Out] int(1/(a+b*exp(d*x+c))^3/x,x)
```

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

$$\frac{3\,adx + (2\,bdxe^{c} + be^{c})e^{(dx)} + a}{2\,\left(a^{2}b^{2}d^{2}x^{2}e^{(2\,dx+2\,c)} + 2\,a^{3}bd^{2}x^{2}e^{(dx+c)} + a^{4}d^{2}x^{2}\right)} + \int \frac{2\,d^{2}x^{2} + 3\,dx + 2}{2\,\left(a^{2}bd^{2}x^{3}e^{(dx+c)} + a^{3}d^{2}x^{3}\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*e^(d*x + c) + a)^3*x),x, algorithm="maxima")

[Out] 1/2*(3*a*d*x + (2*b*d*x*e^c + b*e^c)*e^(d*x) + a)/(a^2*b^2*d^2*x^
2*e^(2*d*x + 2*c) + 2*a^3*b*d^2*x^2*e^(d*x + c) + a^4*d^2*x^2) +
integrate(1/2*(2*d^2*x^2 + 3*d*x + 2)/(a^2*b*d^2*x^3*e^(d*x + c)
+ a^3*d^2*x^3), x)
```

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

$$\text{integral}\left(\frac{1}{b^{3}xe^{(3\,dx+3\,c)} + 3\,ab^{2}xe^{(2\,dx+2\,c)} + 3\,a^{2}bxe^{(dx+c)} + a^{3}x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*e^(d*x + c) + a)^3*x),x, algorithm="fricas")
```

```
[Out] integral(1/(b^3*x*e^(3*d*x + 3*c) + 3*a*b^2*x*e^(2*d*x + 2*c) + 3
*a^2*b*x*e^(d*x + c) + a^3*x), x)
```

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

$$\frac{3adx + a + (2bdx + b)\,e^{c+dx}}{2a^4d^2x^2 + 4a^3bd^2x^2e^{c+dx} + 2a^2b^2d^2x^2e^{2c+2dx}} + \frac{\int \frac{3dx}{ax^3+bx^3e^ce^{dx}}\,dx + \int \frac{2d^2x^2}{ax^3+bx^3e^ce^{dx}}\,dx + \int \frac{2}{ax^3+bx^3e^ce^{dx}}\,dx}{2a^2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*exp(d*x+c))**3/x,x)
```

```
[Out] (3*a*d*x + a + (2*b*d*x + b)*exp(c + d*x))/(2*a**4*d**2*x**2 + 4*
a**3*b*d**2*x**2*exp(c + d*x) + 2*a**2*b**2*d**2*x**2*exp(2*c + 2
*d*x)) + (Integral(3*d*x/(a*x**3 + b*x**3*exp(c)*exp(d*x)), x) +
Integral(2*d**2*x**2/(a*x**3 + b*x**3*exp(c)*exp(d*x)), x) + Inte
gral(2/(a*x**3 + b*x**3*exp(c)*exp(d*x)), x))/(2*a**2*d**2)
```

GIAC/XCAS [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(be^{(dx+c)} + a\right)^3 x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*e^(d*x + c) + a)^3*x),x, algorithm="giac")
```

```
[Out] integrate(1/((b*e^(d*x + c) + a)^3*x), x)
```

3.22 $\int \frac{1}{\left(a+be^{c+dx}\right)^3 x^2}\,dx$

Optimal. Leaf size=20

$$\text{Int}\left(\frac{1}{x^2\left(a+be^{c+dx}\right)^3},x\right)$$

```
[Out] Unintegrable[1/((a + b*E^(c + d*x))^3*x^2), x]
```

Rubi [A] time = 0.0687579, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$

$$\text{Int}\left(\frac{1}{\left(a+be^{c+dx}\right)^3 x^2},x\right)$$

Verification is Not applicable to the result.

```
[In]  Int[1/((a + b*E^(c + d*x))^3*x^2),x]

[Out] Defer[Int][1/((a + b*E^(c + d*x))^3*x^2), x]
```

Rubi in Sympy [A] time = 0., size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*exp(d*x+c))**3/x**2,x)

[Out] Integral(1/(x**2*(a + b*exp(c + d*x))**3), x)
```

Mathematica [A] time = 0.841222, size = 0, normalized size = 0.

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

Verification is Not applicable to the result.

```
[In]  Integrate[1/((a + b*E^(c + d*x))^3*x^2),x]

[Out] Integrate[1/((a + b*E^(c + d*x))^3*x^2), x]
```

Maple [A] time = 0.085, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*exp(d*x+c))^3/x^2,x)

[Out] int(1/(a+b*exp(d*x+c))^3/x^2,x)
```

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

$$\frac{3\,adx+2\,(bdxe^{c}+be^{c})e^{(dx)}+2\,a}{2\,\left(a^{2}b^{2}d^{2}x^{3}e^{(2\,dx+2\,c)}+2\,a^{3}bd^{2}x^{3}e^{(dx+c)}+a^{4}d^{2}x^{3}\right)}+\int\frac{d^{2}x^{2}+3\,dx+3}{a^{2}bd^{2}x^{4}e^{(dx+c)}+a^{3}d^{2}x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*e^(d*x + c) + a)^3*x^2),x, algorithm="maxima")

[Out] 1/2*(3*a*d*x + 2*(b*d*x*e^c + b*e^c)*e^(d*x) + 2*a)/(a^2*b^2*d^2*
x^3*e^(2*d*x + 2*c) + 2*a^3*b*d^2*x^3*e^(d*x + c) + a^4*d^2*x^3)
+ integrate((d^2*x^2 + 3*d*x + 3)/(a^2*b*d^2*x^4*e^(d*x + c) + a^
3*d^2*x^4), x)
```

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

$$\mathrm{integral}\left(\frac{1}{b^{3}x^{2}e^{(3\,dx+3\,c)}+3\,ab^{2}x^{2}e^{(2\,dx+2\,c)}+3\,a^{2}bx^{2}e^{(dx+c)}+a^{3}x^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*e^(d*x + c) + a)^3*x^2),x, algorithm="fricas")
```

```
[Out] integral(1/(b^3*x^2*e^(3*d*x + 3*c) + 3*a*b^2*x^2*e^(2*d*x + 2*c)
 + 3*a^2*b*x^2*e^(d*x + c) + a^3*x^2), x)
```

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

$$\frac{3adx + 2a + (2bdx + 2b)\,e^{c+dx}}{2a^4d^2x^3 + 4a^3bd^2x^3e^{c+dx} + 2a^2b^2d^2x^3e^{2c+2dx}} + \frac{\int \frac{3dx}{ax^4+bx^4e^ce^{dx}}\,dx + \int \frac{d^2x^2}{ax^4+bx^4e^ce^{dx}}\,dx + \int \frac{3}{ax^4+bx^4e^ce^{dx}}\,dx}{a^2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*exp(d*x+c))**3/x**2,x)
```

```
[Out] (3*a*d*x + 2*a + (2*b*d*x + 2*b)*exp(c + d*x))/(2*a**4*d**2*x**3
+ 4*a**3*b*d**2*x**3*exp(c + d*x) + 2*a**2*b**2*d**2*x**3*exp(2*c
 + 2*d*x)) + (Integral(3*d*x/(a*x**4 + b*x**4*exp(c)*exp(d*x)), x
) + Integral(d**2*x**2/(a*x**4 + b*x**4*exp(c)*exp(d*x)), x) + In
tegral(3/(a*x**4 + b*x**4*exp(c)*exp(d*x)), x))/(a**2*d**2)
```

GIAC/XCAS [A] time = 0., size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*e^(d*x + c) + a)^3*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/((b*e^(d*x + c) + a)^3*x^2), x)
```

3.23 $\int \frac{1}{\left(a+be^{c-dx}\right)^3} dx$

Optimal. Leaf size=72

$$\frac{\log\left(a+be^{c-dx}\right)}{a^3d}+\frac{x}{a^3}-\frac{1}{a^2d\left(a+be^{c-dx}\right)}-\frac{1}{2ad\left(a+be^{c-dx}\right)^2}$$

```
[Out] -1/(2*a*d*(a + b*E^(c - d*x))^2) - 1/(a^2*d*(a + b*E^(c - d*x)))
+ x/a^3 + Log[a + b*E^(c - d*x)]/(a^3*d)
```

Rubi [A] time = 0.0854364, antiderivative size = 72, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{\log\left(a+be^{c-dx}\right)}{a^3d}+\frac{x}{a^3}-\frac{1}{a^2d\left(a+be^{c-dx}\right)}-\frac{1}{2ad\left(a+be^{c-dx}\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*E^(c - d*x))^(-3),x]
```

```
[Out] -1/(2*a*d*(a + b*E^(c - d*x))^2) - 1/(a^2*d*(a + b*E^(c - d*x)))
+ x/a^3 + Log[a + b*E^(c - d*x)]/(a^3*d)
```

Rubi in Sympy [A] time = 17.7489, size = 116, normalized size = 1.61

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*exp(-d*x+c))**3,x)
```

```
[Out] -exp(-c + d*x)*exp(c - d*x)/(2*a*d*(a + b*exp(c - d*x))**2) - exp
(-c + d*x)*exp(c - d*x)/(a**2*d*(a + b*exp(c - d*x))) + exp(-c +
d*x)*exp(c - d*x)*log(a + b*exp(c - d*x))/(a**3*d) - exp(-c + d*x
)*exp(c - d*x)*log(exp(c - d*x))/(a**3*d)
```

Mathematica [A] time = 0.0806117, size = 62, normalized size = 0.86

$$\frac{\frac{be^c\left(4ae^{dx}+3be^c\right)}{\left(ae^{dx}+be^c\right)^2}+2\log\left(ae^{dx}+be^c\right)}{2a^3d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*E^(c - d*x))^(-3),x]
```

```
[Out] ((b*E^c*(3*b*E^c + 4*a*E^(d*x)))/(b*E^c + a*E^(d*x))^2 + 2*Log[b*
E^c + a*E^(d*x)])/(2*a^3*d)
```

Maple [A] time = 0.003, size = 79, normalized size = 1.1

$$-\frac{\ln\left(e^{-dx+c}\right)}{da^3}+\frac{\ln\left(a+be^{-dx+c}\right)}{da^3}-\frac{1}{a^2d\left(a+be^{-dx+c}\right)}-\frac{1}{2\,ad\left(a+be^{-dx+c}\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*exp(-d*x+c))^3,x)
```

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

Maxima [A] time = 0.790788, size = 119, normalized size = 1.65

$$-\frac{2\,be^{(-dx+c)}+3\,a}{2\left(2\,a^3be^{(-dx+c)}+a^2b^2e^{(-2\,dx+2\,c)}+a^4\right)d}+\frac{dx-c}{a^3d}+\frac{\log\left(be^{(-dx+c)}+a\right)}{a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.25864, size = 178, normalized size = 2.47

$$\frac{2\,b^{2}dxe^{\left(-2\,dx+2\,c\right)} + 2\,a^{2}dx - 3\,a^{2} + 2\,(2\,abdx - ab)e^{\left(-dx+c\right)} + 2\,\left(2\,abe^{\left(-dx+c\right)} + b^{2}e^{\left(-2\,dx+2\,c\right)} + a^{2}\right)\log\left(be^{\left(-dx+c\right)} + a\right)}{2\,\left(2\,a^{4}bde^{\left(-dx+c\right)} + a^{3}b^{2}de^{\left(-2\,dx+2\,c\right)} + a^{5}d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A] time = 0.424403, size = 78, normalized size = 1.08

$$\frac{-3a - 2be^{c-dx}}{2a^{4}d + 4a^{3}bde^{c-dx} + 2a^{2}b^{2}de^{2c-2dx}} + \frac{x}{a^{3}} + \frac{\log\left(\frac{a}{b} + e^{c-dx}\right)}{a^{3}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*exp(-d*x+c))**3,x)
```

```
[Out] (-3*a - 2*b*exp(c - d*x))/(2*a**4*d + 4*a**3*b*d*exp(c - d*x) + 2
*a**2*b**2*d*exp(2*c - 2*d*x)) + x/a**3 + log(a/b + exp(c - d*x))
/(a**3*d)
```

GIAC/XCAS [A] time = 0.262228, size = 99, normalized size = 1.38

$$\frac{dx - c}{a^{3}d} + \frac{\ln\left(\left|be^{\left(-dx+c\right)} + a\right|\right)}{a^{3}d} - \frac{2\,abe^{\left(-dx+c\right)} + 3\,a^{2}}{2\,\left(be^{\left(-dx+c\right)} + a\right)^{2}a^{3}d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.24 $\int \frac{1}{\left(a+be^{-c-dx}\right)^3}\,dx$

Optimal. Leaf size=78

$$\frac{\log\left(a+be^{-c-dx}\right)}{a^3d}+\frac{x}{a^3}-\frac{1}{a^2d\left(a+be^{-c-dx}\right)}-\frac{1}{2ad\left(a+be^{-c-dx}\right)^2}$$

```
[Out] -1/(2*a*d*(a + b*E^(-c - d*x))^2) - 1/(a^2*d*(a + b*E^(-c - d*x))
) + x/a^3 + Log[a + b*E^(-c - d*x)]/(a^3*d)
```

Rubi [A] time = 0.0920927, antiderivative size = 78, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$\frac{\log\left(a+be^{-c-dx}\right)}{a^3d}+\frac{x}{a^3}-\frac{1}{a^2d\left(a+be^{-c-dx}\right)}-\frac{1}{2ad\left(a+be^{-c-dx}\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*E^(-c - d*x))^(-3),x]
```

```
[Out] -1/(2*a*d*(a + b*E^(-c - d*x))^2) - 1/(a^2*d*(a + b*E^(-c - d*x))
) + x/a^3 + Log[a + b*E^(-c - d*x)]/(a^3*d)
```

Rubi in Sympy [A] time = 17.4879, size = 129, normalized size = 1.65

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*exp(-d*x-c))**3,x)
```

```
[Out] -exp(-c - d*x)*exp(c + d*x)/(2*a*d*(a + b*exp(-c - d*x))**2) - ex
p(-c - d*x)*exp(c + d*x)/(a**2*d*(a + b*exp(-c - d*x))) + exp(-c
- d*x)*exp(c + d*x)*log(a + b*exp(-c - d*x))/(a**3*d) - exp(-c -
d*x)*exp(c + d*x)*log(exp(-c - d*x))/(a**3*d)
```

Mathematica [A] time = 0.0804936, size = 54, normalized size = 0.69

$$\frac{\frac{b\left(4ae^{c+dx}+3b\right)}{\left(ae^{c+dx}+b\right)^2}+2\log\left(ae^{c+dx}+b\right)}{2a^3d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*E^(-c - d*x))^(-3),x]
```

```
[Out] ((b*(3*b + 4*a*E^(c + d*x)))/(b + a*E^(c + d*x))^2 + 2*Log[b + a*
E^(c + d*x)])/(2*a^3*d)
```

Maple [A] time = 0.003, size = 87, normalized size = 1.1

$$-\frac{\ln\left(\mathrm{e}^{-dx-c}\right)}{da^3}+\frac{\ln\left(a+b\mathrm{e}^{-dx-c}\right)}{da^3}-\frac{1}{a^2d\left(a+b\mathrm{e}^{-dx-c}\right)}-\frac{1}{2\,ad\left(a+b\mathrm{e}^{-dx-c}\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*exp(-d*x-c))^3,x)
```

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

Maxima [A] time = 0.768719, size = 124, normalized size = 1.59

$$-\frac{2\,be^{(-dx-c)}+3\,a}{2\left(2\,a^3be^{(-dx-c)}+a^2b^2e^{(-2\,dx-2\,c)}+a^4\right)d}+\frac{dx+c}{a^3d}+\frac{\log\left(be^{(-dx-c)}+a\right)}{a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.262441, size = 189, normalized size = 2.42

$$\frac{2\,b^2dxe^{(-2\,dx-2\,c)}+2\,a^2dx-3\,a^2+2\,(2\,abdx-ab)e^{(-dx-c)}+2\left(2\,abe^{(-dx-c)}+b^2e^{(-2\,dx-2\,c)}+a^2\right)\log\left(be^{(-dx-c)}+a\right)}{2\left(2\,a^4bde^{(-dx-c)}+a^3b^2de^{(-2\,dx-2\,c)}+a^5d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A] time = 0.422483, size = 85, normalized size = 1.09

$$\frac{-3a-2be^{-c-dx}}{2a^4d+4a^3bde^{-c-dx}+2a^2b^2de^{-2c-2dx}}+\frac{x}{a^3}+\frac{\log\left(\frac{a}{b}+e^{-c-dx}\right)}{a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*exp(-d*x-c))**3,x)
```

```
[Out] (-3*a - 2*b*exp(-c - d*x))/(2*a**4*d + 4*a**3*b*d*exp(-c - d*x) +
 2*a**2*b**2*d*exp(-2*c - 2*d*x)) + x/a**3 + log(a/b + exp(-c - d
*x))/(a**3*d)
```

GIAC/XCAS [A] time = 0.248816, size = 104, normalized size = 1.33

$$\frac{dx+c}{a^3d}+\frac{\ln\left(\left|be^{(-dx-c)}+a\right|\right)}{a^3d}-\frac{2\,abe^{(-dx-c)}+3\,a^2}{2\left(be^{(-dx-c)}+a\right)^2a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.25 $\int \left(a+b\left(F^{g(e+fx)}\right)^n\right)(c+dx)^3\,dx$

Optimal. Leaf size=153

$$\frac{a(c+dx)^4}{4d}+\frac{6bd^2(c+dx)\left(F^{eg+fgx}\right)^n}{f^3g^3n^3\log^3(F)}-\frac{3bd(c+dx)^2\left(F^{eg+fgx}\right)^n}{f^2g^2n^2\log^2(F)}+\frac{b(c+dx)^3\left(F^{eg+fgx}\right)^n}{fgn\log(F)}-\frac{6bd^3\left(F^{eg+fgx}\right)^n}{f^4g^4n^4\log^4(F)}$$

```
[Out] (a*(c + d*x)^4)/(4*d) - (6*b*d^3*(F^(e*g + f*g*x))^n)/(f^4*g^4*n^
4*Log[F]^4) + (6*b*d^2*(F^(e*g + f*g*x))^n*(c + d*x))/(f^3*g^3*n^
3*Log[F]^3) - (3*b*d*(F^(e*g + f*g*x))^n*(c + d*x)^2)/(f^2*g^2*n^
2*Log[F]^2) + (b*(F^(e*g + f*g*x))^n*(c + d*x)^3)/(f*g*n*Log[F])
```

Rubi [A] time = 0.412296, antiderivative size = 153, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.13

$$\frac{a(c+dx)^4}{4d}+\frac{6bd^2(c+dx)\left(F^{eg+fgx}\right)^n}{f^3g^3n^3\log^3(F)}-\frac{3bd(c+dx)^2\left(F^{eg+fgx}\right)^n}{f^2g^2n^2\log^2(F)}+\frac{b(c+dx)^3\left(F^{eg+fgx}\right)^n}{fgn\log(F)}-\frac{6bd^3\left(F^{eg+fgx}\right)^n}{f^4g^4n^4\log^4(F)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)*(c + d*x)^3,x]
```

```
[Out] (a*(c + d*x)^4)/(4*d) - (6*b*d^3*(F^(e*g + f*g*x))^n)/(f^4*g^4*n^
4*Log[F]^4) + (6*b*d^2*(F^(e*g + f*g*x))^n*(c + d*x))/(f^3*g^3*n^
3*Log[F]^3) - (3*b*d*(F^(e*g + f*g*x))^n*(c + d*x)^2)/(f^2*g^2*n^
2*Log[F]^2) + (b*(F^(e*g + f*g*x))^n*(c + d*x)^3)/(f*g*n*Log[F])
```

Rubi in Sympy [A] time = 45.5903, size = 144, normalized size = 0.94

$$\frac{a\left(c+dx\right)^4}{4d}-\frac{6bd^3\left(F^{g(e+fx)}\right)^n}{f^4g^4n^4\log\left(F\right)^4}+\frac{6bd^2\left(c+dx\right)\left(F^{g(e+fx)}\right)^n}{f^3g^3n^3\log\left(F\right)^3}-\frac{3bd\left(c+dx\right)^2\left(F^{g(e+fx)}\right)^n}{f^2g^2n^2\log\left(F\right)^2}+\frac{b\left(c+dx\right)^3\left(F^{g(e+fx)}\right)^n}{fgn\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(F**(g*(f*x+e)))**n)*(d*x+c)**3,x)
```

```
[Out] a*(c + d*x)**4/(4*d) - 6*b*d**3*(F**(g*(e + f*x)))**n/(f**4*g**4*
n**4*log(F)**4) + 6*b*d**2*(c + d*x)*(F**(g*(e + f*x)))**n/(f**3*
g**3*n**3*log(F)**3) - 3*b*d*(c + d*x)**2*(F**(g*(e + f*x)))**n/(
f**2*g**2*n**2*log(F)**2) + b*(c + d*x)**3*(F**(g*(e + f*x)))**n/
(f*g*n*log(F))
```

Mathematica [A] time = 0.209358, size = 130, normalized size = 0.85

$$ac^3x + \frac{3}{2}ac^2dx^2 + acd^2x^3 + \frac{1}{4}ad^3x^4 + \frac{b\left(F^{g(e+fx)}\right)^n\left(6d^2fgn\log(F)(c+dx) + f^3g^3n^3\log^3(F)(c+dx)^3 - 3df^2g^2n^2\log^2(F)(c+dx)^2 - 6d^3\right)}{f^4g^4n^4\log^4(F)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)*(c + d*x)^3,x]
```

```
[Out] a*c^3*x + (3*a*c^2*d*x^2)/2 + a*c*d^2*x^3 + (a*d^3*x^4)/4 + (b*(F
^(g*(e + f*x)))^n*(-6*d^3 + 6*d^2*f*g*n*(c + d*x)*Log[F] - 3*d*f^
2*g^2*n^2*(c + d*x)^2*Log[F]^2 + f^3*g^3*n^3*(c + d*x)^3*Log[F]^3
))/(f^4*g^4*n^4*Log[F]^4)
```

Maple [F] time = 0.039, size = 0, normalized size = 0.

$$\int \left(a + b\left(F^{g(fx+e)}\right)^n\right)(dx+c)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(F^(g*(f*x+e)))^n)*(d*x+c)^3,x)
```

```
[Out] int((a+b*(F^(g*(f*x+e)))^n)*(d*x+c)^3,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)*(d*x + c)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.262087, size = 360, normalized size = 2.35

$$\frac{\left(ad^3f^4g^4n^4x^4 + 4\,acd^2f^4g^4n^4x^3 + 6\,ac^2df^4g^4n^4x^2 + 4\,ac^3f^4g^4n^4x\right)\log\left(F\right)^4 - 4\left(6\,bd^3 - \left(bd^3f^3g^3n^3x^3 + 3\,bcd^2f^3g^3n^3x^2 + \cdots\right.\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)*(d*x + c)^3,x, algorithm="fricas")
```

```
[Out] 1/4*((a*d^3*f^4*g^4*n^4*x^4 + 4*a*c*d^2*f^4*g^4*n^4*x^3 + 6*a*c^2
*d*f^4*g^4*n^4*x^2 + 4*a*c^3*f^4*g^4*n^4*x)*log(F)^4 - 4*(6*b*d^3
 - (b*d^3*f^3*g^3*n^3*x^3 + 3*b*c*d^2*f^3*g^3*n^3*x^2 + 3*b*c^2*d
*f^3*g^3*n^3*x + b*c^3*f^3*g^3*n^3)*log(F)^3 + 3*(b*d^3*f^2*g^2*n
^2*x^2 + 2*b*c*d^2*f^2*g^2*n^2*x + b*c^2*d*f^2*g^2*n^2)*log(F)^2
- 6*(b*d^3*f*g*n*x + b*c*d^2*f*g*n)*log(F))*F^(f*g*n*x + e*g*n))/
(f^4*g^4*n^4*log(F)^4)
```

Sympy [A] time = 0.655762, size = 332, normalized size = 2.17

$$ac^3x + \frac{3ac^2dx^2}{2} + acd^2x^3 + \frac{ad^3x^4}{4} + \begin{cases} \frac{\left(bc^3f^3g^3n^3\log\left(F\right)^3 + 3bc^2df^3g^3n^3x\log\left(F\right)^3 - 3bc^2df^2g^2n^2\log\left(F\right)^2 + 3bcd^2f^3g^3n^3x^2\log\left(F\right)^3 - 6bcd^2f^2g^2n^2x\log\left(F\right)^2 + 6bcd^2fgn\log\left(F\right) + bd^3f^3g^3n^3x^3\log \cdots\right.}{f^4g^4n^4\log\left(F\right)^4} & \\ bc^3x + \frac{3bc^2dx^2}{2} + bcd^2x^3 + \frac{bd^3x^4}{4} & \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(F**(g*(f*x+e)))**n)*(d*x+c)**3,x)
```

```
[Out] a*c**3*x + 3*a*c**2*d*x**2/2 + a*c*d**2*x**3 + a*d**3*x**4/4 + Pi
ecewise(((b*c**3*f**3*g**3*n**3*log(F)**3 + 3*b*c**2*d*f**3*g**3*
n**3*x*log(F)**3 - 3*b*c**2*d*f**2*g**2*n**2*log(F)**2 + 3*b*c*d*
*2*f**3*g**3*n**3*x**2*log(F)**3 - 6*b*c*d**2*f**2*g**2*n**2*x*lo
g(F)**2 + 6*b*c*d**2*f*g*n*log(F) + b*d**3*f**3*g**3*n**3*x**3*lo
g(F)**3 - 3*b*d**3*f**2*g**2*n**2*x**2*log(F)**2 + 6*b*d**3*f*g*n
*x*log(F) - 6*b*d**3)*(F**(g*(e + f*x)))**n/(f**4*g**4*n**4*log(F
)**4), Ne(f**4*g**4*n**4*log(F)**4, 0)), (b*c**3*x + 3*b*c**2*d*x
**2/2 + b*c*d**2*x**3 + b*d**3*x**4/4, True))
```

<u>GIAC/XCAS</u> [A] time = 0.318312, size = 1, normalized size = 0.01

Done

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)*(d*x + c)^3,x, algorithm="giac")
```

```
[Out] Done
```

3.26 $\int \left(a+b \left(F^{g(e+f x)}\right)^n\right) (c+d x)^2 \, dx$

Optimal. Leaf size=115

$$\frac{a(c+dx)^3}{3d}-\frac{2bd(c+dx)\left(F^{eg+fgx}\right)^n}{f^2g^2n^2\log^2(F)}+\frac{b(c+dx)^2\left(F^{eg+fgx}\right)^n}{fgn\log(F)}+\frac{2bd^2\left(F^{eg+fgx}\right)^n}{f^3g^3n^3\log^3(F)}$$

```
[Out] (a*(c + d*x)^3)/(3*d) + (2*b*d^2*(F^(e*g + f*g*x))^n)/(f^3*g^3*n^
3*Log[F]^3) - (2*b*d*(F^(e*g + f*g*x))^n*(c + d*x))/(f^2*g^2*n^2*
Log[F]^2) + (b*(F^(e*g + f*g*x))^n*(c + d*x)^2)/(f*g*n*Log[F])
```

Rubi [A] time = 0.268511, antiderivative size = 115, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.13

$$\frac{a(c+dx)^3}{3d}-\frac{2bd(c+dx)\left(F^{eg+fgx}\right)^n}{f^2g^2n^2\log^2(F)}+\frac{b(c+dx)^2\left(F^{eg+fgx}\right)^n}{fgn\log(F)}+\frac{2bd^2\left(F^{eg+fgx}\right)^n}{f^3g^3n^3\log^3(F)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)*(c + d*x)^2,x]
```

```
[Out] (a*(c + d*x)^3)/(3*d) + (2*b*d^2*(F^(e*g + f*g*x))^n)/(f^3*g^3*n^
3*Log[F]^3) - (2*b*d*(F^(e*g + f*g*x))^n*(c + d*x))/(f^2*g^2*n^2*
Log[F]^2) + (b*(F^(e*g + f*g*x))^n*(c + d*x)^2)/(f*g*n*Log[F])
```

Rubi in Sympy [A] time = 28.9089, size = 105, normalized size = 0.91

$$\frac{a\left(c+dx\right)^3}{3d}+\frac{2bd^2\left(F^{g(e+fx)}\right)^n}{f^3g^3n^3\log\left(F\right)^3}-\frac{2bd\left(c+dx\right)\left(F^{g(e+fx)}\right)^n}{f^2g^2n^2\log\left(F\right)^2}+\frac{b\left(c+dx\right)^2\left(F^{g(e+fx)}\right)^n}{fgn\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(F**(g*(f*x+e)))**n)*(d*x+c)**2,x)
```

```
[Out] a*(c + d*x)**3/(3*d) + 2*b*d**2*(F**(g*(e + f*x)))**n/(f**3*g**3*
n**3*log(F)**3) - 2*b*d*(c + d*x)*(F**(g*(e + f*x)))**n/(f**2*g**
2*n**2*log(F)**2) + b*(c + d*x)**2*(F**(g*(e + f*x)))**n/(f*g*n*l
og(F))
```

Mathematica [A] time = 0.145187, size = 91, normalized size = 0.79

$$ac^2x + acdx^2 + \frac{1}{3}ad^2x^3 + \frac{b\left(F^{g(e+fx)}\right)^n\left(f^2g^2n^2\log^2(F)(c+dx)^2 - 2dfgn\log(F)(c+dx) + 2d^2\right)}{f^3g^3n^3\log^3(F)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)*(c + d*x)^2,x]
```

```
[Out] a*c^2*x + a*c*d*x^2 + (a*d^2*x^3)/3 + (b*(F^(g*(e + f*x)))^n*(2*d
^2 - 2*d*f*g*n*(c + d*x)*Log[F] + f^2*g^2*n^2*(c + d*x)^2*Log[F]^
2))/(f^3*g^3*n^3*Log[F]^3)
```

Maple [A] time = 0.046, size = 199, normalized size = 1.7

$$ac^2x + acdx^2 + \frac{be^{n\ln\left(e^{g(fx+e)\ln(F)}\right)}c^2}{ngf\ln(F)} - 2\frac{be^{n\ln\left(e^{g(fx+e)\ln(F)}\right)}cd}{(\ln(F))^2f^2g^2n^2} + 2\frac{be^{n\ln\left(e^{g(fx+e)\ln(F)}\right)}d^2}{(\ln(F))^3f^3g^3n^3} + \frac{bd^2x^2e^{n\ln\left(e^{g(fx+e)\ln(F)}\right)}}{ngf\ln(F)} + \frac{ad^2x^3}{3} + 2\frac{bd(\ln(F)cfgn - d)xe^{n\ln\left(e^{g(fx+e)\ln(F)}\right)}}{(\ln(F))^2f^2g^2n^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(F^(g*(f*x+e)))^n)*(d*x+c)^2,x)
```

```
[Out] a*c^2*x+a*c*d*x^2+b/ln(F)/f/g/n*exp(n*ln(exp(g*(f*x+e)*ln(F))))*c
^2-2*b/ln(F)^2/f^2/g^2/n^2*exp(n*ln(exp(g*(f*x+e)*ln(F))))*c*d+2*
b/ln(F)^3/f^3/g^3/n^3*exp(n*ln(exp(g*(f*x+e)*ln(F))))*d^2+1/n/g/f
/ln(F)*b*d^2*x^2*exp(n*ln(exp(g*(f*x+e)*ln(F))))+1/3*a*d^2*x^3+2*
b*d*(ln(F)*c*f*g*n-d)/ln(F)^2/f^2/g^2/n^2*x*exp(n*ln(exp(g*(f*x+e
)*ln(F))))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)*(d*x + c)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.261793, size = 224, normalized size = 1.95

$$\frac{\left(ad^2f^3g^3n^3x^3 + 3\,acdf^3g^3n^3x^2 + 3\,ac^2f^3g^3n^3x\right)\log(F)^3 + 3\left(2\,bd^2 + \left(bd^2f^2g^2n^2x^2 + 2\,bcdf^2g^2n^2x + bc^2f^2g^2n^2\right)\log(F)^2 -\right.}{3\,f^3g^3n^3\log(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)*(d*x + c)^2,x, algorithm="fricas")
```

```
[Out] 1/3*((a*d^2*f^3*g^3*n^3*x^3 + 3*a*c*d*f^3*g^3*n^3*x^2 + 3*a*c^2*f
^3*g^3*n^3*x)*log(F)^3 + 3*(2*b*d^2 + (b*d^2*f^2*g^2*n^2*x^2 + 2*
b*c*d*f^2*g^2*n^2*x + b*c^2*f^2*g^2*n^2)*log(F)^2 - 2*(b*d^2*f*g*
n*x + b*c*d*f*g*n)*log(F))*F^(f*g*n*x + e*g*n))/(f^3*g^3*n^3*log(
F)^3)
```

Sympy [A] time = 0.514271, size = 196, normalized size = 1.7

$$ac^2x + acdx^2 + \frac{ad^2x^3}{3} + \begin{cases} \frac{\left(bc^2f^2g^2n^2\log(F)^2 + 2bcdf^2g^2n^2x\log(F)^2 - 2bcdfgn\log(F) + bd^2f^2g^2n^2x^2\log(F)^2 - 2bd^2fgnx\log(F) + 2bd^2\right)\left(F^{g(e+fx)}\right)^n}{f^3g^3n^3\log(F)^3} & \text{for } f^3g^3n^3\log(F)^3 \neq \\ bc^2x + bcdx^2 + \frac{bd^2x^3}{3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(F**(g*(f*x+e)))**n)*(d*x+c)**2,x)
```

```
[Out] a*c**2*x + a*c*d*x**2 + a*d**2*x**3/3 + Piecewise(((b*c**2*f**2*g
**2*n**2*log(F)**2 + 2*b*c*d*f**2*g**2*n**2*x*log(F)**2 - 2*b*c*d
*f*g*n*log(F) + b*d**2*f**2*g**2*n**2*x**2*log(F)**2 - 2*b*d**2*f
*g*n*x*log(F) + 2*b*d**2)*(F**(g*(e + f*x)))**n/(f**3*g**3*n**3*l
og(F)**3), Ne(f**3*g**3*n**3*log(F)**3, 0)), (b*c**2*x + b*c*d*x*
*2 + b*d**2*x**3/3, True))
```

GIAC/XCAS [A] time = 0.277035, size = 1, normalized size = 0.01

$$\textit{Done}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)*(d*x + c)^2,x, algorithm="giac")

[Out] Done
```

3.27 $\int \left(a+b \left(F^{g(e+f x)}\right)^n\right) (c+d x) \, dx$

Optimal. Leaf size=77

$$\frac{a(c+dx)^2}{2d}+\frac{b(c+dx)\left(F^{eg+fgx}\right)^n}{fgn\log(F)}-\frac{bd\left(F^{eg+fgx}\right)^n}{f^2g^2n^2\log^2(F)}$$

```
[Out] (a*(c + d*x)^2)/(2*d) - (b*d*(F^(e*g + f*g*x))^n)/(f^2*g^2*n^2*Lo
g[F]^2) + (b*(F^(e*g + f*g*x))^n*(c + d*x))/(f*g*n*Log[F])
```

Rubi [A] time = 0.135804, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{a(c+dx)^2}{2d}+\frac{b(c+dx)\left(F^{eg+fgx}\right)^n}{fgn\log(F)}-\frac{bd\left(F^{eg+fgx}\right)^n}{f^2g^2n^2\log^2(F)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)*(c + d*x),x]
```

```
[Out] (a*(c + d*x)^2)/(2*d) - (b*d*(F^(e*g + f*g*x))^n)/(f^2*g^2*n^2*Lo
g[F]^2) + (b*(F^(e*g + f*g*x))^n*(c + d*x))/(f*g*n*Log[F])
```

Rubi in Sympy [A] time = 13.937, size = 65, normalized size = 0.84

$$\frac{a\left(c+dx\right)^2}{2d}-\frac{bd\left(F^{g(e+fx)}\right)^n}{f^2g^2n^2\log\left(F\right)^2}+\frac{b\left(c+dx\right)\left(F^{g(e+fx)}\right)^n}{fgn\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(F**(g*(f*x+e)))**n)*(d*x+c),x)
```

```
[Out] a*(c + d*x)**2/(2*d) - b*d*(F**(g*(e + f*x)))**n/(f**2*g**2*n**2*
log(F)**2) + b*(c + d*x)*(F**(g*(e + f*x)))**n/(f*g*n*log(F))
```

Mathematica [A] time = 0.168407, size = 73, normalized size = 0.95

$$\frac{1}{2}ax(2c+dx)+\frac{b(c+dx)\left(F^{g(e+fx)}\right)^n}{fgn\log(F)}-\frac{bd\left(F^{g(e+fx)}\right)^n}{f^2g^2n^2\log^2(F)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)*(c + d*x),x]
```

```
[Out] (a*x*(2*c + d*x))/2 - (b*d*(F^(g*(e + f*x)))^n)/(f^2*g^2*n^2*Log[
F]^2) + (b*(F^(g*(e + f*x)))^n*(c + d*x))/(f*g*n*Log[F])
```

Maple [A] time = 0.03, size = 105, normalized size = 1.4

$$acx + \frac{b e^{n \ln\left(e^{g(fx+e)\ln(F)}\right)} c}{ngf \ln(F)} - \frac{b e^{n \ln\left(e^{g(fx+e)\ln(F)}\right)} d}{(\ln(F))^2 f^2 g^2 n^2} + \frac{bdx e^{n \ln\left(e^{g(fx+e)\ln(F)}\right)}}{ngf \ln(F)} + \frac{adx^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(F^(g*(f*x+e)))^n)*(d*x+c),x)
```

```
[Out] a*c*x+b/n/g/f/ln(F)*exp(n*ln(exp(g*(f*x+e)*ln(F))))*c-b/n^2/g^2/f
^2/ln(F)^2*exp(n*ln(exp(g*(f*x+e)*ln(F))))*d+1/n/g/f/ln(F)*b*d*x*
exp(n*ln(exp(g*(f*x+e)*ln(F))))+1/2*a*d*x^2
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)*(d*x + c),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.279655, size = 117, normalized size = 1.52

$$\frac{\left(adf^2g^2n^2x^2 + 2\,acf^2g^2n^2x\right)\log(F)^2 - 2\,(bd - (bdfgnx + bcfgn)\log(F))F^{fgnx+egn}}{2\,f^2g^2n^2\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)*(d*x + c),x, algorithm="fricas")
```

```
[Out] 1/2*((a*d*f^2*g^2*n^2*x^2 + 2*a*c*f^2*g^2*n^2*x)*log(F)^2 - 2*(b*
d - (b*d*f*g*n*x + b*c*f*g*n)*log(F))*F^(f*g*n*x + e*g*n))/(f^2*g
^2*n^2*log(F)^2)
```

Sympy [A] time = 0.397601, size = 94, normalized size = 1.22

$$acx + \frac{adx^2}{2} + \begin{cases} \frac{(bcfgn\log(F) + bdfgnx\log(F) - bd)\left(F^{g(e+fx)}\right)^n}{f^2g^2n^2\log(F)^2} & \text{for } f^2g^2n^2\log(F)^2 \neq 0 \\ bcx + \frac{bdx^2}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(F**(g*(f*x+e)))**n)*(d*x+c),x)
```

```
[Out] a*c*x + a*d*x**2/2 + Piecewise(((b*c*f*g*n*log(F) + b*d*f*g*n*x*l
og(F) - b*d)*(F**(g*(e + f*x)))**n/(f**2*g**2*n**2*log(F)**2), Ne
(f**2*g**2*n**2*log(F)**2, 0)), (b*c*x + b*d*x**2/2, True))
```

GIAC/XCAS [A] time = 0.275421, size = 1, normalized size = 0.01

$$\mathit{Done}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)*(d*x + c),x, algorithm="giac")
```

```
[Out] Done
```

3.28 $\int \left(a+b \left(F^{g(e+f x)}\right)^n\right) \, dx$

Optimal. Leaf size=30

$$ax+\frac{b \left(F^{g(e+f x)}\right)^n}{f g n \log(F)}$$

```
[Out] a*x + (b*(F^(g*(e + f*x)))^n)/(f*g*n*Log[F])
```

Rubi [A] time = 0.0346001, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$ax+\frac{b \left(F^{g(e+f x)}\right)^n}{f g n \log(F)}$$

Antiderivative was successfully verified.

```
[In]  Int[a + b*(F^(g*(e + f*x)))^n,x]
```

```
[Out] a*x + (b*(F^(g*(e + f*x)))^n)/(f*g*n*Log[F])
```

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

$$\frac{b \left(F^{g(e+f x)}\right)^n}{f g n \log(F)}+\int a \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(a+b*(F**(g*(f*x+e)))**n,x)
```

```
[Out] b*(F**(g*(e + f*x)))**n/(f*g*n*log(F)) + Integral(a, x)
```

Mathematica [A] time = 0.03314, size = 30, normalized size = 1.

$$ax+\frac{b \left(F^{g(e+f x)}\right)^n}{f g n \log(F)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[a + b*(F^(g*(e + f*x)))^n,x]
```

```
[Out] a*x + (b*(F^(g*(e + f*x)))^n)/(f*g*n*Log[F])
```

Maple [A] time = 0.004, size = 31, normalized size = 1.

$$ax+\frac{b\left(F^{g(fx+e)}\right)^{n}}{ngf\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(a+b*(F^(g*(f*x+e)))^n,x)
```

```
[Out] a*x+b*(F^(g*(f*x+e)))^n/f/g/n/ln(F)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((F^((f*x + e)*g))^n*b + a,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.259679, size = 50, normalized size = 1.67

$$\frac{afgnx\log(F)+F^{fgnx+egn}b}{fgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((F^((f*x + e)*g))^n*b + a,x, algorithm="fricas")
```

```
[Out] (a*f*g*n*x*log(F) + F^(f*g*n*x + e*g*n)*b)/(f*g*n*log(F))
```

Sympy [A] time = 0.2318, size = 32, normalized size = 1.07

$$ax + \begin{cases} \frac{b\left(F^{g(e+fx)}\right)^{n}}{fgn\log\left(F\right)} & \text{for } fgn\log\left(F\right) \neq 0 \\ bx & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(a+b*(F**(g*(f*x+e)))**n,x)
```

```
[Out] a*x + Piecewise((b*(F**(g*(e + f*x)))**n/(f*g*n*log(F)), Ne(f*g*n
*log(F), 0)), (b*x, True))
```

GIAC/XCAS [A] time = 0.264939, size = 43, normalized size = 1.43

$$ax + \frac{F^{fgnx+gne}b}{fgn\ln\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((F^((f*x + e)*g))^n*b + a,x, algorithm="giac")
```

```
[Out] a*x + F^(f*g*n*x + g*n*e)*b/(f*g*n*ln(F))
```

3.29 $\int \frac{a+b\left(F^{g(e+fx)}\right)^n}{c+dx}\,dx$

Optimal. Leaf size=68

$$\frac{a\log(c+dx)}{d}+\frac{b\left(F^{eg+fgx}\right)^n F^{gn\left(e-\frac{cf}{d}\right)-gn(e+fx)}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right)}{d}$$

```
[Out] (b*F^((e - (c*f)/d)*g*n - g*n*(e + f*x))*(F^(e*g + f*g*x))^n*ExpI
ntegralEi[(f*g*n*(c + d*x)*Log[F])/d])/d + (a*Log[c + d*x])/d
```

Rubi [A] time = 0.225586, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.13

$$\frac{a\log(c+dx)}{d}+\frac{b\left(F^{eg+fgx}\right)^n F^{gn\left(e-\frac{cf}{d}\right)-gn(e+fx)}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right)}{d}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)/(c + d*x),x]
```

```
[Out] (b*F^((e - (c*f)/d)*g*n - g*n*(e + f*x))*(F^(e*g + f*g*x))^n*ExpI
ntegralEi[(f*g*n*(c + d*x)*Log[F])/d])/d + (a*Log[c + d*x])/d
```

Rubi in Sympy [A] time = 15.4127, size = 65, normalized size = 0.96

$$\frac{F^{gn(-e-fx)}F^{-\frac{gn(cf-de)}{d}}b\left(F^{g(e+fx)}\right)^n \operatorname{Ei}\left(\frac{fgn(c+dx)\log(F)}{d}\right)}{d}+\frac{a\log(c+dx)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(F**(g*(f*x+e)))**n)/(d*x+c),x)
```

```
[Out] F**(g*n*(-e - f*x))*F**(-g*n*(c*f - d*e)/d)*b*(F**(g*(e + f*x)))*
*n*Ei(f*g*n*(c + d*x)*log(F)/d)/d + a*log(c + d*x)/d
```

Mathematica [A] time = 0.0988741, size = 56, normalized size = 0.82

$$\frac{a\log(c+dx)+b\left(F^{g(e+fx)}\right)^nF^{-\frac{fgn(c+dx)}{d}}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right)}{d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)/(c + d*x),x]
```

```
[Out] ((b*(F^(g*(e + f*x)))^n*ExpIntegralEi[(f*g*n*(c + d*x)*Log[F])/d]
)/F^((f*g*n*(c + d*x))/d) + a*Log[c + d*x])/d
```

Maple [F] time = 0.07, size = 0, normalized size = 0.

$$\int\frac{a+b\left(F^{g(fx+e)}\right)^n}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(F^(g*(f*x+e)))^n)/(d*x+c),x)
```

```
[Out] int((a+b*(F^(g*(f*x+e)))^n)/(d*x+c),x)
```

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

$$(F^{eg})^n b\int\frac{\left(F^{fgx}\right)^n}{dx+c}\,dx+\frac{a\log(dx+c)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)/(d*x + c),x, algorithm="maxima")
```

```
[Out] (F^(e*g))^n*b*integrate((F^(f*g*x))^n/(d*x + c), x) + a*log(d*x +
 c)/d
```

Fricas [A] time = 0.283091, size = 68, normalized size = 1.

$$\frac{F^{\frac{(de-cf)gn}{d}}b\text{Ei}\left(\frac{(dfgnx+cfgn)\log(F)}{d}\right)+a\log(dx+c)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)/(d*x + c),x, algorithm="fricas")
```

```
[Out] (F^((d*e - c*f)*g*n/d)*b*Ei((d*f*g*n*x + c*f*g*n)*log(F)/d) + a*l
og(d*x + c))/d
```

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

$$\int \frac{a+b\left(F^{eg}F^{fgx}\right)^n}{c+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(F**(g*(f*x+e)))**n)/(d*x+c),x)
```

```
[Out] Integral((a + b*(F**(e*g)*F**(f*g*x))**n)/(c + d*x), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(F^{(fx+e)g}\right)^n b+a}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)/(d*x + c),x, algorithm="giac")
```

```
[Out] integrate(((F^((f*x + e)*g))^n*b + a)/(d*x + c), x)
```

3.30 $\int \frac{a+b\left(F^{g(e+fx)}\right)^n}{(c+dx)^2}\,dx$

Optimal. Leaf size=100

$$-\frac{a}{d(c+dx)}+\frac{bfgn\log(F)\left(F^{eg+fgx}\right)^nF^{gn\left(e-\frac{cf}{d}\right)-gn(e+fx)}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right)}{d^2}-\frac{b\left(F^{eg+fgx}\right)^n}{d(c+dx)}$$

```
[Out] -(a/(d*(c + d*x))) - (b*(F^(e*g + f*g*x))^n)/(d*(c + d*x)) + (b*f
*F^((e - (c*f)/d)*g*n - g*n*(e + f*x))*(F^(e*g + f*g*x))^n*g*n*Ex
pIntegralEi[(f*g*n*(c + d*x)*Log[F])/d]*Log[F])/d^2
```

Rubi [A] time = 0.286518, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174

$$-\frac{a}{d(c+dx)}+\frac{bfgn\log(F)\left(F^{eg+fgx}\right)^nF^{gn\left(e-\frac{cf}{d}\right)-gn(e+fx)}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right)}{d^2}-\frac{b\left(F^{eg+fgx}\right)^n}{d(c+dx)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)/(c + d*x)^2,x]
```



```
[Out] -(a/(d*(c + d*x))) - (b*(F^(e*g + f*g*x))^n)/(d*(c + d*x)) + (b*f
*F^((e - (c*f)/d)*g*n - g*n*(e + f*x))*(F^(e*g + f*g*x))^n*g*n*Ex
pIntegralEi[(f*g*n*(c + d*x)*Log[F])/d]*Log[F])/d^2
```

Rubi in Sympy [A] time = 21.44, size = 92, normalized size = 0.92

$$\frac{F^{gn(-e-fx)}F^{-\frac{gn(cf-de)}{d}}bfgn\left(F^{g(e+fx)}\right)^n\log(F)\operatorname{Ei}\left(\frac{fgn(c+dx)\log(F)}{d}\right)}{d^2}-\frac{a}{d(c+dx)}-\frac{b\left(F^{g(e+fx)}\right)^n}{d(c+dx)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(F**(g*(f*x+e)))**n)/(d*x+c)**2,x)
```

```
[Out] F**(g*n*(-e - f*x))*F**(-g*n*(c*f - d*e)/d)*b*f*g*n*(F**(g*(e + f
*x)))**n*log(F)*Ei(f*g*n*(c + d*x)*log(F)/d)/d**2 - a/(d*(c + d*x
)) - b*(F**(g*(e + f*x)))**n/(d*(c + d*x))
```

Mathematica [A] time = 0.303208, size = 78, normalized size = 0.78

$$\frac{bfgn\log(F)\left(F^{g(e+fx)}\right)^{n}F^{-\frac{fgn(c+dx)}{d}}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right)-\frac{d\left(a+b\left(F^{g(e+fx)}\right)^{n}\right)}{c+dx}}{d^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)/(c + d*x)^2,x]
```

```
[Out] (-((d*(a + b*(F^(g*(e + f*x)))^n))/(c + d*x)) + (b*f*(F^(g*(e + f
*x)))^n*g*n*ExpIntegralEi[(f*g*n*(c + d*x)*Log[F])/d]*Log[F])/F^(
(f*g*n*(c + d*x))/d))/d^2
```

Maple [F] time = 0.068, size = 0, normalized size = 0.

$$\int \frac{a+b\left(F^{g(fx+e)}\right)^{n}}{(dx+c)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(F^(g*(f*x+e)))^n)/(d*x+c)^2,x)
```

```
[Out] int((a+b*(F^(g*(f*x+e)))^n)/(d*x+c)^2,x)
```

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

$$\left(F^{eg}\right)^{n}b\int \frac{\left(F^{fgx}\right)^{n}}{d^{2}x^{2}+2\,cdx+c^{2}}\,dx-\frac{a}{d^{2}x+cd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)/(d*x + c)^2,x, algorithm="maxima")
```

```
[Out] (F^(e*g))^n*b*integrate((F^(f*g*x))^n/(d^2*x^2 + 2*c*d*x + c^2),
x) - a/(d^2*x + c*d)
```

Fricas [A] time = 0.27773, size = 117, normalized size = 1.17

$$\frac{(bdfgnx + bcfgn)F^{\frac{(de-cf)gn}{d}}\,\mathrm{Ei}\left(\frac{(dfgnx+cfgn)\log(F)}{d}\right)\log(F) - F^{fgnx+egn}bd - ad}{d^3x + cd^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)/(d*x + c)^2,x, algorithm="fricas")
```

```
[Out] ((b*d*f*g*n*x + b*c*f*g*n)*F^((d*e - c*f)*g*n/d)*Ei((d*f*g*n*x +
c*f*g*n)*log(F)/d)*log(F) - F^(f*g*n*x + e*g*n)*b*d - a*d)/(d^3*x
 + c*d^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(F**(g*(f*x+e)))**n)/(d*x+c)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(F^{(fx+e)g}\right)^n b + a}{(dx+c)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)/(d*x + c)^2,x, algorithm="giac")
```

```
[Out] integrate(((F^((f*x + e)*g))^n*b + a)/(d*x + c)^2, x)
```

3.31 $\int \frac{a+b\left(F^{g(e+fx)}\right)^n}{(c+dx)^3}\,dx$

Optimal. Leaf size=147

$$-\frac{a}{2d(c+dx)^2}+\frac{bf^2g^2n^2\log^2(F)\left(F^{eg+fgx}\right)^nF^{gn\left(e-\frac{cf}{d}\right)-gn(e+fx)}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right)}{2d^3}-\frac{bfgn\log(F)\left(F^{eg+fgx}\right)^n}{2d^2(c+dx)}-\frac{b\left(F^{eg+fgx}\right)^n}{2d(c+dx)^2}$$

```
[Out] -a/(2*d*(c + d*x)^2) - (b*(F^(e*g + f*g*x))^n)/(2*d*(c + d*x)^2)
- (b*f*(F^(e*g + f*g*x))^n*g*n*Log[F])/(2*d^2*(c + d*x)) + (b*f^2
*F^((e - (c*f)/d)*g*n - g*n*(e + f*x))*(F^(e*g + f*g*x))^n*g^2*n^
2*ExpIntegralEi[(f*g*n*(c + d*x)*Log[F])/d]*Log[F]^2)/(2*d^3)
```

Rubi [A] time = 0.396775, antiderivative size = 147, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174

$$-\frac{a}{2d(c+dx)^2}+\frac{bf^2g^2n^2\log^2(F)\left(F^{eg+fgx}\right)^nF^{gn\left(e-\frac{cf}{d}\right)-gn(e+fx)}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right)}{2d^3}-\frac{bfgn\log(F)\left(F^{eg+fgx}\right)^n}{2d^2(c+dx)}-\frac{b\left(F^{eg+fgx}\right)^n}{2d(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)/(c + d*x)^3,x]
```

```
[Out] -a/(2*d*(c + d*x)^2) - (b*(F^(e*g + f*g*x))^n)/(2*d*(c + d*x)^2)
- (b*f*(F^(e*g + f*g*x))^n*g*n*Log[F])/(2*d^2*(c + d*x)) + (b*f^2
*F^((e - (c*f)/d)*g*n - g*n*(e + f*x))*(F^(e*g + f*g*x))^n*g^2*n^
2*ExpIntegralEi[(f*g*n*(c + d*x)*Log[F])/d]*Log[F]^2)/(2*d^3)
```

Rubi in Sympy [A] time = 33.0717, size = 138, normalized size = 0.94

$$\frac{F^{gn(-e-fx)}F^{-\frac{gn(cf-de)}{d}}bf^2g^2n^2\left(F^{g(e+fx)}\right)^n\log(F)^2\operatorname{Ei}\left(\frac{fgn(c+dx)\log(F)}{d}\right)}{2d^3}-\frac{a}{2d\,(c+dx)^2}-\frac{b\left(F^{g(e+fx)}\right)^n}{2d\,(c+dx)^2}-\frac{bfgn\left(F^{g(e+fx)}\right)^n\log(F)}{2d^2\,(c+dx)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(F**(g*(f*x+e)))**n)/(d*x+c)**3,x)
```

```
[Out] F**(g*n*(-e - f*x))*F**(-g*n*(c*f - d*e)/d)*b*f**2*g**2*n**2*(F**
(g*(e + f*x)))**n*log(F)**2*Ei(f*g*n*(c + d*x)*log(F)/d)/(2*d**3)
 - a/(2*d*(c + d*x)**2) - b*(F**(g*(e + f*x)))**n/(2*d*(c + d*x)*
*2) - b*f*g*n*(F**(g*(e + f*x)))**n*log(F)/(2*d**2*(c + d*x))
```

Mathematica [A] time = 0.298804, size = 111, normalized size = 0.76

$$-\frac{ad^2 - bf^2g^2n^2\log^2(F)(c+dx)^2\left(F^{g(e+fx)}\right)^nF^{-\frac{fgn(c+dx)}{d}}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right) + bd\left(F^{g(e+fx)}\right)^n(fgn\log(F)(c+dx}{2d^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)/(c + d*x)^3,x]
```

```
[Out] -(a*d^2 - (b*f^2*(F^(g*(e + f*x)))^n*g^2*n^2*(c + d*x)^2*ExpInteg
ralEi[(f*g*n*(c + d*x)*Log[F])/d]*Log[F]^2)/F^((f*g*n*(c + d*x))/
d) + b*d*(F^(g*(e + f*x)))^n*(d + f*g*n*(c + d*x)*Log[F]))/(2*d^3
*(c + d*x)^2)
```

Maple [F] time = 0.032, size = 0, normalized size = 0.

$$\int \frac{a+b\left(F^{g(fx+e)}\right)^n}{(dx+c)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(F^(g*(f*x+e)))^n)/(d*x+c)^3,x)
```

```
[Out] int((a+b*(F^(g*(f*x+e)))^n)/(d*x+c)^3,x)
```

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

$$(F^{eg})^n b\int \frac{\left(F^{fgx}\right)^n}{d^3x^3 + 3\,cd^2x^2 + 3\,c^2dx + c^3}\,dx - \frac{a}{2\,(d^3x^2 + 2\,cd^2x + c^2d)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)/(d*x + c)^3,x, algorithm="maxima")
```

```
[Out] (F^(e*g))^n*b*integrate((F^(f*g*x))^n/(d^3*x^3 + 3*c*d^2*x^2 + 3*
c^2*d*x + c^3), x) - 1/2*a/(d^3*x^2 + 2*c*d^2*x + c^2*d)
```

Fricas [A] time = 0.279228, size = 216, normalized size = 1.47

$$\frac{\left(bd^2f^2g^2n^2x^2 + 2\,bcdf^2g^2n^2x + bc^2f^2g^2n^2\right)F^{\frac{(de-cf)gn}{d}}\mathrm{Ei}\left(\frac{(dfgnx+cfgn)\log(F)}{d}\right)\log(F)^2 - ad^2 - \left(bd^2 + \left(bd^2fgnx + bcdfgn\right)\right.}{2\left(d^5x^2 + 2\,cd^4x + c^2d^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)/(d*x + c)^3,x, algorithm="fricas")
```

```
[Out] 1/2*((b*d^2*f^2*g^2*n^2*x^2 + 2*b*c*d*f^2*g^2*n^2*x + b*c^2*f^2*g
^2*n^2)*F^((d*e - c*f)*g*n/d)*Ei((d*f*g*n*x + c*f*g*n)*log(F)/d)*
log(F)^2 - a*d^2 - (b*d^2 + (b*d^2*f*g*n*x + b*c*d*f*g*n)*log(F))
*F^(f*g*n*x + e*g*n))/(d^5*x^2 + 2*c*d^4*x + c^2*d^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*(F**(g*(f*x+e)))**n)/(d*x+c)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(F^{(fx+e)g}\right)^n b + a}{(dx+c)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)/(d*x + c)^3,x, algorithm="giac")

[Out] integrate(((F^((f*x + e)*g))^n*b + a)/(d*x + c)^3, x)
```

3.32 $\int \left(a+b\left(F^{g(e+fx)}\right)^n\right)^2 (c+dx)^3\,dx$

Optimal. Leaf size=322

$$\frac{a^2(c+dx)^4}{4d}+\frac{12abd^2(c+dx)\left(F^{eg+fgx}\right)^n}{f^3g^3n^3\log^3(F)}-\frac{6abd(c+dx)^2\left(F^{eg+fgx}\right)^n}{f^2g^2n^2\log^2(F)}+\frac{2ab(c+dx)^3\left(F^{eg+fgx}\right)^n}{fgn\log(F)}-\frac{12abd^3\left(F^{eg+fgx}\right)^n}{f^4g^4n^4\log^4(F)}+\frac{3b^2d^2(c+dx)\left(F^{eg+fgx}\right)^{2n}}{4f^3g^3n^3\log^3(F)}-\frac{3b^2d(c+dx)^2\left(F^{eg+fgx}\right)^{2n}}{4f^2g^2n^2\log^2(F)}+\frac{b^2(c+dx)^3\left(F^{eg+fgx}\right)^{2n}}{2fgn\log(F)}-\frac{3b^2d^3\left(F^{eg+fgx}\right)^{2n}}{8f^4g^4n^4\log^4(F)}$$

```
[Out] (a^2*(c + d*x)^4)/(4*d) - (12*a*b*d^3*(F^(e*g + f*g*x))^n)/(f^4*g
^4*n^4*Log[F]^4) - (3*b^2*d^3*(F^(e*g + f*g*x))^(2*n))/(8*f^4*g^4
*n^4*Log[F]^4) + (12*a*b*d^2*(F^(e*g + f*g*x))^n*(c + d*x))/(f^3*
g^3*n^3*Log[F]^3) + (3*b^2*d^2*(F^(e*g + f*g*x))^(2*n)*(c + d*x))
/(4*f^3*g^3*n^3*Log[F]^3) - (6*a*b*d*(F^(e*g + f*g*x))^n*(c + d*x
)^2)/(f^2*g^2*n^2*Log[F]^2) - (3*b^2*d*(F^(e*g + f*g*x))^(2*n)*(c
 + d*x)^2)/(4*f^2*g^2*n^2*Log[F]^2) + (2*a*b*(F^(e*g + f*g*x))^n*
(c + d*x)^3)/(f*g*n*Log[F]) + (b^2*(F^(e*g + f*g*x))^(2*n)*(c + d
*x)^3)/(2*f*g*n*Log[F])
```

Rubi [A] time = 0.831167, antiderivative size = 322, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.12$

$$\frac{a^2(c+dx)^4}{4d}+\frac{12abd^2(c+dx)\left(F^{eg+fgx}\right)^n}{f^3g^3n^3\log^3(F)}-\frac{6abd(c+dx)^2\left(F^{eg+fgx}\right)^n}{f^2g^2n^2\log^2(F)}+\frac{2ab(c+dx)^3\left(F^{eg+fgx}\right)^n}{fgn\log(F)}-\frac{12abd^3\left(F^{eg+fgx}\right)^n}{f^4g^4n^4\log^4(F)}+\frac{3b^2d^2(c+dx)\left(F^{eg+fgx}\right)^{2n}}{4f^3g^3n^3\log^3(F)}-\frac{3b^2d(c+dx)^2\left(F^{eg+fgx}\right)^{2n}}{4f^2g^2n^2\log^2(F)}+\frac{b^2(c+dx)^3\left(F^{eg+fgx}\right)^{2n}}{2fgn\log(F)}-\frac{3b^2d^3\left(F^{eg+fgx}\right)^{2n}}{8f^4g^4n^4\log^4(F)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)^2*(c + d*x)^3,x]
```

```
[Out] (a^2*(c + d*x)^4)/(4*d) - (12*a*b*d^3*(F^(e*g + f*g*x))^n)/(f^4*g
^4*n^4*Log[F]^4) - (3*b^2*d^3*(F^(e*g + f*g*x))^(2*n))/(8*f^4*g^4
*n^4*Log[F]^4) + (12*a*b*d^2*(F^(e*g + f*g*x))^n*(c + d*x))/(f^3*
g^3*n^3*Log[F]^3) + (3*b^2*d^2*(F^(e*g + f*g*x))^(2*n)*(c + d*x))
/(4*f^3*g^3*n^3*Log[F]^3) - (6*a*b*d*(F^(e*g + f*g*x))^n*(c + d*x
)^2)/(f^2*g^2*n^2*Log[F]^2) - (3*b^2*d*(F^(e*g + f*g*x))^(2*n)*(c
 + d*x)^2)/(4*f^2*g^2*n^2*Log[F]^2) + (2*a*b*(F^(e*g + f*g*x))^n*
```

```
(c + d*x)^3)/(f*g*n*Log[F]) + (b^2*(F^(e*g + f*g*x))^(2*n)*(c + d
*x)^3)/(2*f*g*n*Log[F])
```

Rubi in Sympy [A] time = 109.006, size = 309, normalized size = 0.96

$$\frac{a^2(c+dx)^4}{4d}-\frac{12abd^3\left(F^{g(e+fx)}\right)^n}{f^4g^4n^4\log(F)^4}+\frac{12abd^2(c+dx)\left(F^{g(e+fx)}\right)^n}{f^3g^3n^3\log(F)^3}-\frac{6abd(c+dx)^2\left(F^{g(e+fx)}\right)^n}{f^2g^2n^2\log(F)^2}+\frac{2ab(c+dx)^3\left(F^{g(e+fx)}\right)^n}{fgn\log(F)}-\frac{3b^2d^3\left(F^{g(e+fx)}\right)^{2n}}{8f^4g^4n^4\log(F)^4}+\frac{3b^2d^2(c+dx)\left(F^{g(e+fx)}\right)^{2n}}{4f^3g^3n^3\log(F)^3}-\frac{3b^2d(c+dx)^2\left(F^{g(e+fx)}\right)^{2n}}{4f^2g^2n^2\log(F)^2}+\frac{b^2(c+dx)^3\left(F^{g(e+fx)}\right)^{2n}}{2fgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(F**(g*(f*x+e)))**n)**2*(d*x+c)**3,x)
```

```
[Out] a**2*(c + d*x)**4/(4*d) - 12*a*b*d**3*(F**(g*(e + f*x)))**n/(f**4
*g**4*n**4*log(F)**4) + 12*a*b*d**2*(c + d*x)*(F**(g*(e + f*x)))*
*n/(f**3*g**3*n**3*log(F)**3) - 6*a*b*d*(c + d*x)**2*(F**(g*(e +
f*x)))**n/(f**2*g**2*n**2*log(F)**2) + 2*a*b*(c + d*x)**3*(F**(g*
(e + f*x)))**n/(f*g*n*log(F)) - 3*b**2*d**3*(F**(g*(e + f*x)))**(
2*n)/(8*f**4*g**4*n**4*log(F)**4) + 3*b**2*d**2*(c + d*x)*(F**(g*
(e + f*x)))**(2*n)/(4*f**3*g**3*n**3*log(F)**3) - 3*b**2*d*(c + d
*x)**2*(F**(g*(e + f*x)))**(2*n)/(4*f**2*g**2*n**2*log(F)**2) + b
**2*(c + d*x)**3*(F**(g*(e + f*x)))**(2*n)/(2*f*g*n*log(F))
```

Mathematica [A] time = 0.3766, size = 239, normalized size = 0.74

$$a^2c^3x+\frac{3}{2}a^2c^2dx^2+a^2cd^2x^3+\frac{1}{4}a^2d^3x^4+\frac{2ab\left(F^{g(e+fx)}\right)^n\left(6d^2fgn\log(F)(c+dx)+f^3g^3n^3\log^3(F)(c+dx)^3-3df^2g^2n^2\log^2(F)(c+dx)^2-6d^3\right)}{f^4g^4n^4\log^4(F)}+\frac{b^2\left(F^{g(e+fx)}\right)^{2n}\left(6d^2fgn\log(F)(c+dx)+4f^3g^3n^3\log^3(F)(c+dx)^3-6df^2g^2n^2\log^2(F)(c+dx)^2-3d^3\right)}{8f^4g^4n^4\log^4(F)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)^2*(c + d*x)^3,x]
```

```
[Out] a^2*c^3*x + (3*a^2*c^2*d*x^2)/2 + a^2*c*d^2*x^3 + (a^2*d^3*x^4)/4
 + (2*a*b*(F^(g*(e + f*x)))^n*(-6*d^3 + 6*d^2*f*g*n*(c + d*x)*Log
[F] - 3*d*f^2*g^2*n^2*(c + d*x)^2*Log[F]^2 + f^3*g^3*n^3*(c + d*x
)^3*Log[F]^3))/(f^4*g^4*n^4*Log[F]^4) + (b^2*(F^(g*(e + f*x)))^(2
*n)*(-3*d^3 + 6*d^2*f*g*n*(c + d*x)*Log[F] - 6*d*f^2*g^2*n^2*(c +
 d*x)^2*Log[F]^2 + 4*f^3*g^3*n^3*(c + d*x)^3*Log[F]^3))/(8*f^4*g^
4*n^4*Log[F]^4)
```

Maple [F] time = 0.027, size = 0, normalized size = 0.

$$\int \left(a + b\left(F^{g(fx+e)}\right)^{n}\right)^{2} (dx+c)^{3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(F^(g*(f*x+e)))^n)^2*(d*x+c)^3,x)
```

```
[Out] int((a+b*(F^(g*(f*x+e)))^n)^2*(d*x+c)^3,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^2*(d*x + c)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.267489, size = 651, normalized size = 2.02

$$\frac{2\left(a^{2}d^{3}f^{4}g^{4}n^{4}x^{4} + 4\,a^{2}cd^{2}f^{4}g^{4}n^{4}x^{3} + 6\,a^{2}c^{2}df^{4}g^{4}n^{4}x^{2} + 4\,a^{2}c^{3}f^{4}g^{4}n^{4}x\right)\log(F)^{4} - \left(3\,b^{2}d^{3} - 4\left(b^{2}d^{3}f^{3}g^{3}n^{3}x^{3} + 3\,b^{2}cd^{2}f^{3}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^2*(d*x + c)^3,x, algorithm="fricas")
```

```
[Out] 1/8*(2*(a^2*d^3*f^4*g^4*n^4*x^4 + 4*a^2*c*d^2*f^4*g^4*n^4*x^3 + 6
*a^2*c^2*d*f^4*g^4*n^4*x^2 + 4*a^2*c^3*f^4*g^4*n^4*x)*log(F)^4 -
```

```
(3*b^2*d^3 - 4*(b^2*d^3*f^3*g^3*n^3*x^3 + 3*b^2*c*d^2*f^3*g^3*n^3
*x^2 + 3*b^2*c^2*d*f^3*g^3*n^3*x + b^2*c^3*f^3*g^3*n^3)*log(F)^3
+ 6*(b^2*d^3*f^2*g^2*n^2*x^2 + 2*b^2*c*d^2*f^2*g^2*n^2*x + b^2*c^
2*d*f^2*g^2*n^2)*log(F)^2 - 6*(b^2*d^3*f*g*n*x + b^2*c*d^2*f*g*n)
*log(F))*F^(2*f*g*n*x + 2*e*g*n) - 16*(6*a*b*d^3 - (a*b*d^3*f^3*g
^3*n^3*x^3 + 3*a*b*c*d^2*f^3*g^3*n^3*x^2 + 3*a*b*c^2*d*f^3*g^3*n^
3*x + a*b*c^3*f^3*g^3*n^3)*log(F)^3 + 3*(a*b*d^3*f^2*g^2*n^2*x^2
+ 2*a*b*c*d^2*f^2*g^2*n^2*x + a*b*c^2*d*f^2*g^2*n^2)*log(F)^2 - 6
*(a*b*d^3*f*g*n*x + a*b*c*d^2*f*g*n)*log(F))*F^(f*g*n*x + e*g*n))
/(f^4*g^4*n^4*log(F)^4)
```

Sympy [A] time = 1.15785, size = 709, normalized size = 2.2

$$a^2c^3x + \frac{3a^2c^2dx^2}{2} + a^2cd^2x^3 + \frac{a^2d^3x^4}{4} + \begin{cases} \frac{\left(4b^2c^3f^7g^7n^7\log(F)^7 + 12b^2c^2df^7g^7n^7x\log(F)^7 - 6b^2c^2df^6g^6n^6\log(F)^6 + 12b^2cd^2f^7g^7n^7x^2\log(F)^7 - 12b^2cd^2f^6g^6n^6x\log(F)^6 + 6b^2cd^2f^5g^5n^5\log(F)^5 + 4b\right.}{} \\ x^4\left(\frac{abd^3}{2} + \frac{b^2d^3}{4}\right) + x^3\left(2abcd^2 + b^2cd^2\right) + x^2\left(3abc^2d + \frac{3b^2c^2d}{2}\right) + x\left(2abc^3 + b^2c^3\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(F**(g*(f*x+e)))**n)**2*(d*x+c)**3,x)
```

```
[Out] a**2*c**3*x + 3*a**2*c**2*d*x**2/2 + a**2*c*d**2*x**3 + a**2*d**3
*x**4/4 + Piecewise((((4*b**2*c**3*f**7*g**7*n**7*log(F)**7 + 12*
b**2*c**2*d*f**7*g**7*n**7*x*log(F)**7 - 6*b**2*c**2*d*f**6*g**6*
n**6*log(F)**6 + 12*b**2*c*d**2*f**7*g**7*n**7*x**2*log(F)**7 - 1
2*b**2*c*d**2*f**6*g**6*n**6*x*log(F)**6 + 6*b**2*c*d**2*f**5*g**
5*n**5*log(F)**5 + 4*b**2*d**3*f**7*g**7*n**7*x**3*log(F)**7 - 6*
b**2*d**3*f**6*g**6*n**6*x**2*log(F)**6 + 6*b**2*d**3*f**5*g**5*n
**5*x*log(F)**5 - 3*b**2*d**3*f**4*g**4*n**4*log(F)**4)*(F**(g*(e
 + f*x)))**(2*n) + (16*a*b*c**3*f**7*g**7*n**7*log(F)**7 + 48*a*b
*c**2*d*f**7*g**7*n**7*x*log(F)**7 - 48*a*b*c**2*d*f**6*g**6*n**6
*log(F)**6 + 48*a*b*c*d**2*f**7*g**7*n**7*x**2*log(F)**7 - 96*a*b
*c*d**2*f**6*g**6*n**6*x*log(F)**6 + 96*a*b*c*d**2*f**5*g**5*n**5
*log(F)**5 + 16*a*b*d**3*f**7*g**7*n**7*x**3*log(F)**7 - 48*a*b*d
**3*f**6*g**6*n**6*x**2*log(F)**6 + 96*a*b*d**3*f**5*g**5*n**5*x*
log(F)**5 - 96*a*b*d**3*f**4*g**4*n**4*log(F)**4)*(F**(g*(e + f*x
)))**n)/(8*f**8*g**8*n**8*log(F)**8), Ne(8*f**8*g**8*n**8*log(F)*
*8, 0)), (x**4*(a*b*d**3/2 + b**2*d**3/4) + x**3*(2*a*b*c*d**2 +
b**2*c*d**2) + x**2*(3*a*b*c**2*d + 3*b**2*c**2*d/2) + x*(2*a*b*c
**3 + b**2*c**3), True))
```

GIAC/XCAS [A] time = 0.446292, size = 1, normalized size = 0.

Done

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)^2*(d*x + c)^3,x, algorithm="giac")
```

```
[Out] Done
```

3.33 $\int \left(a+b\left(F^{g(e+fx)}\right)^n\right)^2 (c+dx)^2\,dx$

Optimal. Leaf size=239

$$\frac{a^2(c+dx)^3}{3d}-\frac{4abd(c+dx)\left(F^{eg+fgx}\right)^n}{f^2g^2n^2\log^2(F)}+\frac{2ab(c+dx)^2\left(F^{eg+fgx}\right)^n}{fgn\log(F)}+\frac{4abd^2\left(F^{eg+fgx}\right)^n}{f^3g^3n^3\log^3(F)}-\frac{b^2d(c+dx)\left(F^{eg+fgx}\right)^{2n}}{2f^2g^2n^2\log^2(F)}+\frac{b^2(c+dx)^2\left(F^{eg+fgx}\right)^{2n}}{2fgn\log(F)}+\frac{b^2d^2\left(F^{eg+fgx}\right)^{2n}}{4f^3g^3n^3\log^3(F)}$$

```
[Out] (a^2*(c + d*x)^3)/(3*d) + (4*a*b*d^2*(F^(e*g + f*g*x))^n)/(f^3*g^
3*n^3*Log[F]^3) + (b^2*d^2*(F^(e*g + f*g*x))^(2*n))/(4*f^3*g^3*n^
3*Log[F]^3) - (4*a*b*d*(F^(e*g + f*g*x))^n*(c + d*x))/(f^2*g^2*n^
2*Log[F]^2) - (b^2*d*(F^(e*g + f*g*x))^(2*n)*(c + d*x))/(2*f^2*g^
2*n^2*Log[F]^2) + (2*a*b*(F^(e*g + f*g*x))^n*(c + d*x)^2)/(f*g*n*
Log[F]) + (b^2*(F^(e*g + f*g*x))^(2*n)*(c + d*x)^2)/(2*f*g*n*Log[
F])
```

Rubi [A] time = 0.55896, antiderivative size = 239, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.12

$$\frac{a^2(c+dx)^3}{3d}-\frac{4abd(c+dx)\left(F^{eg+fgx}\right)^n}{f^2g^2n^2\log^2(F)}+\frac{2ab(c+dx)^2\left(F^{eg+fgx}\right)^n}{fgn\log(F)}+\frac{4abd^2\left(F^{eg+fgx}\right)^n}{f^3g^3n^3\log^3(F)}-\frac{b^2d(c+dx)\left(F^{eg+fgx}\right)^{2n}}{2f^2g^2n^2\log^2(F)}+\frac{b^2(c+dx)^2\left(F^{eg+fgx}\right)^{2n}}{2fgn\log(F)}+\frac{b^2d^2\left(F^{eg+fgx}\right)^{2n}}{4f^3g^3n^3\log^3(F)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)^2*(c + d*x)^2,x]
```


```
[Out] (a^2*(c + d*x)^3)/(3*d) + (4*a*b*d^2*(F^(e*g + f*g*x))^n)/(f^3*g^
3*n^3*Log[F]^3) + (b^2*d^2*(F^(e*g + f*g*x))^(2*n))/(4*f^3*g^3*n^
3*Log[F]^3) - (4*a*b*d*(F^(e*g + f*g*x))^n*(c + d*x))/(f^2*g^2*n^
2*Log[F]^2) - (b^2*d*(F^(e*g + f*g*x))^(2*n)*(c + d*x))/(2*f^2*g^
2*n^2*Log[F]^2) + (2*a*b*(F^(e*g + f*g*x))^n*(c + d*x)^2)/(f*g*n*
Log[F]) + (b^2*(F^(e*g + f*g*x))^(2*n)*(c + d*x)^2)/(2*f*g*n*Log[
F])
```

Rubi in Sympy [A] time = 70.0214, size = 221, normalized size = 0.92

$$\frac{a^2 (c+dx)^3}{3d} + \frac{4abd^2 \left(F^{g(e+fx)}\right)^n}{f^3 g^3 n^3 \log(F)^3} - \frac{4abd (c+dx) \left(F^{g(e+fx)}\right)^n}{f^2 g^2 n^2 \log(F)^2} + \frac{2ab (c+dx)^2 \left(F^{g(e+fx)}\right)^n}{fgn \log(F)} + \frac{b^2 d^2 \left(F^{g(e+fx)}\right)^{2n}}{4f^3 g^3 n^3 \log(F)^3} - \frac{b^2 d (c+dx) \left(F^{g(e+fx)}\right)^{2n}}{2f^2 g^2 n^2 \log(F)^2} + \frac{b^2 (c+dx)^2 \left(F^{g(e+fx)}\right)^{2n}}{2fgn \log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(F**(g*(f*x+e)))**n)**2*(d*x+c)**2,x)
```

```
[Out] a**2*(c + d*x)**3/(3*d) + 4*a*b*d**2*(F**(g*(e + f*x)))**n/(f**3*
g**3*n**3*log(F)**3) - 4*a*b*d*(c + d*x)*(F**(g*(e + f*x)))**n/(f
**2*g**2*n**2*log(F)**2) + 2*a*b*(c + d*x)**2*(F**(g*(e + f*x)))*
*n/(f*g*n*log(F)) + b**2*d**2*(F**(g*(e + f*x)))**(2*n)/(4*f**3*g
**3*n**3*log(F)**3) - b**2*d*(c + d*x)*(F**(g*(e + f*x)))**(2*n)/
(2*f**2*g**2*n**2*log(F)**2) + b**2*(c + d*x)**2*(F**(g*(e + f*x)
))**(2*n)/(2*f*g*n*log(F))
```

Mathematica [A] time = 0.31706, size = 171, normalized size = 0.72

$$a^2c^2x + a^2cdx^2 + \frac{1}{3}a^2d^2x^3 + \frac{2ab \left(F^{g(e+fx)}\right)^n \left(f^2g^2n^2 \log^2(F)(c+dx)^2 - 2dfgn \log(F)(c+dx) + 2d^2\right)}{f^3g^3n^3 \log^3(F)} + \frac{b^2 \left(F^{g(e+fx)}\right)^{2n} \left(2f^2g^2n^2 \log^2(F)(c+dx)^2 - 2dfgn \log(F)(c+dx) + d^2\right)}{4f^3g^3n^3 \log^3(F)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)^2*(c + d*x)^2,x]
```

```
[Out] a^2*c^2*x + a^2*c*d*x^2 + (a^2*d^2*x^3)/3 + (2*a*b*(F^(g*(e + f*x
)))^n*(2*d^2 - 2*d*f*g*n*(c + d*x)*Log[F] + f^2*g^2*n^2*(c + d*x)
^2*Log[F]^2))/(f^3*g^3*n^3*Log[F]^3) + (b^2*(F^(g*(e + f*x)))^(2*
n)*(d^2 - 2*d*f*g*n*(c + d*x)*Log[F] + 2*f^2*g^2*n^2*(c + d*x)^2*
Log[F]^2))/(4*f^3*g^3*n^3*Log[F]^3)
```

Maple [F] time = 0.024, size = 0, normalized size = 0.

$$\int \left(a + b\left(F^{g(fx+e)}\right)^n\right)^2 (dx+c)^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(F^(g*(f*x+e)))^n)^2*(d*x+c)^2,x)
```

```
[Out] int((a+b*(F^(g*(f*x+e)))^n)^2*(d*x+c)^2,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^2*(d*x + c)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.291782, size = 387, normalized size = 1.62

$$\frac{4\left(a^2d^2f^3g^3n^3x^3 + 3\,a^2cdf^3g^3n^3x^2 + 3\,a^2c^2f^3g^3n^3x\right)\log\left(F\right)^3 + 3\left(b^2d^2 + 2\left(b^2d^2f^2g^2n^2x^2 + 2\,b^2cdf^2g^2n^2x + b^2c^2f^2g^2n^2\right)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^2*(d*x + c)^2,x, algorithm="fricas")
```

```
[Out] 1/12*(4*(a^2*d^2*f^3*g^3*n^3*x^3 + 3*a^2*c*d*f^3*g^3*n^3*x^2 + 3*
a^2*c^2*f^3*g^3*n^3*x)*log(F)^3 + 3*(b^2*d^2 + 2*(b^2*d^2*f^2*g^2
*n^2*x^2 + 2*b^2*c*d*f^2*g^2*n^2*x + b^2*c^2*f^2*g^2*n^2)*log(F)^
2 - 2*(b^2*d^2*f*g*n*x + b^2*c*d*f*g*n)*log(F))*F^(2*f*g*n*x + 2*
e*g*n) + 24*(2*a*b*d^2 + (a*b*d^2*f^2*g^2*n^2*x^2 + 2*a*b*c*d*f^2
*g^2*n^2*x + a*b*c^2*f^2*g^2*n^2)*log(F)^2 - 2*(a*b*d^2*f*g*n*x +
 a*b*c*d*f*g*n)*log(F))*F^(f*g*n*x + e*g*n))/(f^3*g^3*n^3*log(F)^
3)
```

Sympy [A] time = 0.909525, size = 439, normalized size = 1.84

$$a^2c^2x + a^2cdx^2 + \frac{a^2d^2x^3}{3} + \begin{cases} \frac{\left(2b^2c^2f^5g^5n^5\log\left(F\right)^5 + 4b^2cdf^5g^5n^5x\log\left(F\right)^5 - 2b^2cdf^4g^4n^4\log\left(F\right)^4 + 2b^2d^2f^5g^5n^5x^2\log\left(F\right)^5 - 2b^2d^2f^4g^4n^4x\log\left(F\right)^4 + b^2d^2f^3g^3n^3\log\left(F\right)^3\right)\left(F^{g(e+fx)}\right)^{2n}}{4f^6} \\ x^3\left(\frac{2abd^2}{3} + \frac{b^2d^2}{3}\right) + x^2\left(2abcd + b^2cd\right) + x\left(2abc^2 + b^2c^2\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(F**(g*(f*x+e)))**n)**2*(d*x+c)**2,x)
```

```
[Out] a**2*c**2*x + a**2*c*d*x**2 + a**2*d**2*x**3/3 + Piecewise((((2*b
**2*c**2*f**5*g**5*n**5*log(F)**5 + 4*b**2*c*d*f**5*g**5*n**5*x*l
og(F)**5 - 2*b**2*c*d*f**4*g**4*n**4*log(F)**4 + 2*b**2*d**2*f**5
*g**5*n**5*x**2*log(F)**5 - 2*b**2*d**2*f**4*g**4*n**4*x*log(F)**
4 + b**2*d**2*f**3*g**3*n**3*log(F)**3)*(F**(g*(e + f*x)))**(2*n)
 + (8*a*b*c**2*f**5*g**5*n**5*log(F)**5 + 16*a*b*c*d*f**5*g**5*n*
*5*x*log(F)**5 - 16*a*b*c*d*f**4*g**4*n**4*log(F)**4 + 8*a*b*d**2
*f**5*g**5*n**5*x**2*log(F)**5 - 16*a*b*d**2*f**4*g**4*n**4*x*log
(F)**4 + 16*a*b*d**2*f**3*g**3*n**3*log(F)**3)*(F**(g*(e + f*x)))
**n)/(4*f**6*g**6*n**6*log(F)**6), Ne(4*f**6*g**6*n**6*log(F)**6,
 0)), (x**3*(2*a*b*d**2/3 + b**2*d**2/3) + x**2*(2*a*b*c*d + b**2
*c*d) + x*(2*a*b*c**2 + b**2*c**2), True))
```

GIAC/XCAS [A] time = 0.405481, size = 1, normalized size = 0.

Done

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)^2*(d*x + c)^2,x, algorithm="giac")
```

```
[Out] Done
```

3.34 $\int \left(a+b \left(F^{g (e+f x)}\right)^n\right)^2 (c+d x) \, dx$

Optimal. Leaf size=156

$$\frac{a^2(c+dx)^2}{2d}+\frac{2ab(c+dx)\left(F^{eg+fgx}\right)^n}{fgn\log(F)}-\frac{2abd\left(F^{eg+fgx}\right)^n}{f^2g^2n^2\log^2(F)}+\frac{b^2(c+dx)\left(F^{eg+fgx}\right)^{2n}}{2fgn\log(F)}-\frac{b^2d\left(F^{eg+fgx}\right)^{2n}}{4f^2g^2n^2\log^2(F)}$$

```
[Out] (a^2*(c + d*x)^2)/(2*d) - (2*a*b*d*(F^(e*g + f*g*x))^n)/(f^2*g^2*
n^2*Log[F]^2) - (b^2*d*(F^(e*g + f*g*x))^(2*n))/(4*f^2*g^2*n^2*Lo
g[F]^2) + (2*a*b*(F^(e*g + f*g*x))^n*(c + d*x))/(f*g*n*Log[F]) +
(b^2*(F^(e*g + f*g*x))^(2*n)*(c + d*x))/(2*f*g*n*Log[F])
```

Rubi [A] time = 0.285767, antiderivative size = 156, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.13

$$\frac{a^2(c+dx)^2}{2d}+\frac{2ab(c+dx)\left(F^{eg+fgx}\right)^n}{fgn\log(F)}-\frac{2abd\left(F^{eg+fgx}\right)^n}{f^2g^2n^2\log^2(F)}+\frac{b^2(c+dx)\left(F^{eg+fgx}\right)^{2n}}{2fgn\log(F)}-\frac{b^2d\left(F^{eg+fgx}\right)^{2n}}{4f^2g^2n^2\log^2(F)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)^2*(c + d*x),x]
```

```
[Out] (a^2*(c + d*x)^2)/(2*d) - (2*a*b*d*(F^(e*g + f*g*x))^n)/(f^2*g^2*
n^2*Log[F]^2) - (b^2*d*(F^(e*g + f*g*x))^(2*n))/(4*f^2*g^2*n^2*Lo
g[F]^2) + (2*a*b*(F^(e*g + f*g*x))^n*(c + d*x))/(f*g*n*Log[F]) +
(b^2*(F^(e*g + f*g*x))^(2*n)*(c + d*x))/(2*f*g*n*Log[F])
```

Rubi in Sympy [A] time = 36.2494, size = 138, normalized size = 0.88

$$\frac{a^2\left(c+dx\right)^2}{2d}-\frac{2abd\left(F^{g(e+fx)}\right)^n}{f^2g^2n^2\log\left(F\right)^2}+\frac{2ab\left(c+dx\right)\left(F^{g(e+fx)}\right)^n}{fgn\log\left(F\right)}-\frac{b^2d\left(F^{g(e+fx)}\right)^{2n}}{4f^2g^2n^2\log\left(F\right)^2}+\frac{b^2\left(c+dx\right)\left(F^{g(e+fx)}\right)^{2n}}{2fgn\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(F**(g*(f*x+e)))**n)**2*(d*x+c),x)
```

```
[Out] a**2*(c + d*x)**2/(2*d) - 2*a*b*d*(F**(g*(e + f*x)))**n/(f**2*g**
2*n**2*log(F)**2) + 2*a*b*(c + d*x)*(F**(g*(e + f*x)))**n/(f*g*n*
log(F)) - b**2*d*(F**(g*(e + f*x)))**(2*n)/(4*f**2*g**2*n**2*log(
```

```
F)**2) + b**2*(c + d*x)*(F**(g*(e + f*x)))**(2*n)/(2*f*g*n*log(F)
)
```

Mathematica [A] time = 0.262822, size = 117, normalized size = 0.75

$$\frac{2a^2f^2g^2n^2x\log^2(F)(2c+dx)+2bfgn\log(F)(c+dx)\left(F^{g(e+fx)}\right)^n\left(4a+b\left(F^{g(e+fx)}\right)^n\right)-bd\left(F^{g(e+fx)}\right)^n\left(8a+b\left(F^{g(e+fx)}\right)^n\right)}{4f^2g^2n^2\log^2(F)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)^2*(c + d*x),x]
```

```
[Out] (-(b*d*(F^(g*(e + f*x)))^n*(8*a + b*(F^(g*(e + f*x)))^n)) + 2*b*f
*(F^(g*(e + f*x)))^n*(4*a + b*(F^(g*(e + f*x)))^n)*g*n*(c + d*x)*
Log[F] + 2*a^2*f^2*g^2*n^2*x*(2*c + d*x)*Log[F]^2)/(4*f^2*g^2*n^2
*Log[F]^2)
```

Maple [A] time = 0.05, size = 220, normalized size = 1.4

$$a^2cx+\frac{a^2dx^2}{2}+\frac{b^2\left(e^{n\ln\left(e^{g(fx+e)\ln(F)}\right)}\right)^2c}{2\,ngf\ln(F)}-\frac{b^2\left(e^{n\ln\left(e^{g(fx+e)\ln(F)}\right)}\right)^2d}{4\,(\ln(F))^2f^2g^2n^2}+2\,\frac{abe^{n\ln\left(e^{g(fx+e)\ln(F)}\right)}c}{ngf\ln(F)}-2\,\frac{abe^{n\ln\left(e^{g(fx+e)\ln(F)}\right)}d}{(\ln(F))^2f^2g^2n^2}+\frac{b^2dx\left(e^{n\ln\left(e^{g(fx+e)\ln(F)}\right)}\right)^2}{2\,ngf\ln(F)}+2\,\frac{abdxe^{n\ln\left(e^{g(fx+e)\ln(F)}\right)}}{ngf\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(F^(g*(f*x+e)))^n)^2*(d*x+c),x)
```

```
[Out] a^2*c*x+1/2*a^2*d*x^2+1/2*b^2/n/g/f/ln(F)*exp(n*ln(exp(g*(f*x+e)*
ln(F))))^2*c-1/4*b^2/n^2/g^2/f^2/ln(F)^2*exp(n*ln(exp(g*(f*x+e)*l
n(F))))^2*d+2*a*b/n/g/f/ln(F)*exp(n*ln(exp(g*(f*x+e)*ln(F))))*c-2
*a*b/n^2/g^2/f^2/ln(F)^2*exp(n*ln(exp(g*(f*x+e)*ln(F))))*d+1/2/n/
g/f/ln(F)*b^2*d*x*exp(n*ln(exp(g*(f*x+e)*ln(F))))^2+2/n/g/f/ln(F)
*a*b*d*x*exp(n*ln(exp(g*(f*x+e)*ln(F))))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)^2*(d*x + c),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.284366, size = 188, normalized size = 1.21

$$\frac{2\left(a^2df^2g^2n^2x^2 + 2\,a^2cf^2g^2n^2x\right)\log\left(F\right)^2 - \left(b^2d - 2\left(b^2dfgnx + b^2cfgn\right)\log\left(F\right)\right)F^{2\,fgnx+2\,egn} - 8\left(abd - \left(abdfgnx + abc\right.\right.}{4\,f^2g^2n^2\log\left(F\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)^2*(d*x + c),x, algorithm="fricas")
```

```
[Out] 1/4*(2*(a^2*d*f^2*g^2*n^2*x^2 + 2*a^2*c*f^2*g^2*n^2*x)*log(F)^2 -
 (b^2*d - 2*(b^2*d*f*g*n*x + b^2*c*f*g*n)*log(F))*F^(2*f*g*n*x +
2*e*g*n) - 8*(a*b*d - (a*b*d*f*g*n*x + a*b*c*f*g*n)*log(F))*F^(f*
g*n*x + e*g*n))/(f^2*g^2*n^2*log(F)^2)
```

Sympy [A] time = 0.681715, size = 233, normalized size = 1.49

$$a^2cx + \frac{a^2dx^2}{2} + \begin{cases} \frac{\left(2b^2cf^3g^3n^3\log\left(F\right)^3 + 2b^2df^3g^3n^3x\log\left(F\right)^3 - b^2df^2g^2n^2\log\left(F\right)^2\right)\left(F^{g(e+fx)}\right)^{2n} + \left(8abcf^3g^3n^3\log\left(F\right)^3 + 8abdf^3g^3n^3x\log\left(F\right)^3 - 8abdf^2g^2n^2\log\left(F\right)^2\right)\left(F^{g(\ldots}\right.}{4f^4g^4n^4\log\left(F\right)^4} \\ x^2\left(abd + \frac{b^2d}{2}\right) + x\left(2abc + b^2c\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(F**(g*(f*x+e)))**n)**2*(d*x+c),x)
```

```
[Out] a**2*c*x + a**2*d*x**2/2 + Piecewise((((2*b**2*c*f**3*g**3*n**3*l
og(F)**3 + 2*b**2*d*f**3*g**3*n**3*x*log(F)**3 - b**2*d*f**2*g**2
*n**2*log(F)**2)*(F**(g*(e + f*x)))**(2*n) + (8*a*b*c*f**3*g**3*n
**3*log(F)**3 + 8*a*b*d*f**3*g**3*n**3*x*log(F)**3 - 8*a*b*d*f**2
*g**2*n**2*log(F)**2)*(F**(g*(e + f*x)))**n)/(4*f**4*g**4*n**4*lo
g(F)**4), Ne(4*f**4*g**4*n**4*log(F)**4, 0)), (x**2*(a*b*d + b**2
*d/2) + x*(2*a*b*c + b**2*c), True))
```

GIAC/XCAS [A] time = 0.354923, size = 1, normalized size = 0.01

$$\text{Done}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^2*(d*x + c),x, algorithm="giac")
```

```
[Out] Done
```

3.35 $\int \left(a+b\left(F^{g(e+fx)}\right)^n\right)^2 \, dx$

Optimal. Leaf size=67

$$a^2x+\frac{2ab\left(F^{g(e+fx)}\right)^n}{fgn\log(F)}+\frac{b^2\left(F^{g(e+fx)}\right)^{2n}}{2fgn\log(F)}$$

```
[Out] a^2*x + (2*a*b*(F^(g*(e + f*x)))^n)/(f*g*n*Log[F]) + (b^2*(F^(g*(
e + f*x)))^(2*n))/(2*f*g*n*Log[F])
```

Rubi [A] time = 0.0824926, antiderivative size = 67, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176

$$a^2x+\frac{2ab\left(F^{g(e+fx)}\right)^n}{fgn\log(F)}+\frac{b^2\left(F^{g(e+fx)}\right)^{2n}}{2fgn\log(F)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)^2,x]
```

```
[Out] a^2*x + (2*a*b*(F^(g*(e + f*x)))^n)/(f*g*n*Log[F]) + (b^2*(F^(g*(
e + f*x)))^(2*n))/(2*f*g*n*Log[F])
```

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

$$\frac{a^2\log\left(\left(F^{g(e+fx)}\right)^n\right)}{fgn\log\left(F\right)}+\frac{2ab\left(F^{g(e+fx)}\right)^n}{fgn\log\left(F\right)}+\frac{b^2\int^{\left(F^{g(e+fx)}\right)^n} x\,dx}{fgn\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(F**(g*(f*x+e)))**n)**2,x)
```

```
[Out] a**2*log((F**(g*(e + f*x)))**n)/(f*g*n*log(F)) + 2*a*b*(F**(g*(e
+ f*x)))**n/(f*g*n*log(F)) + b**2*Integral(x, (x, (F**(g*(e + f*x
)))**n))/(f*g*n*log(F))
```

Mathematica [A] time = 0.100352, size = 52, normalized size = 0.78

$$a^2x+\frac{b\left(F^{g(e+fx)}\right)^n\left(4a+b\left(F^{g(e+fx)}\right)^n\right)}{2fgn\log(F)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)^2,x]
```

```
[Out] a^2*x + (b*(F^(g*(e + f*x)))^n*(4*a + b*(F^(g*(e + f*x)))^n))/(2*
f*g*n*Log[F])
```

Maple [A] time = 0.023, size = 90, normalized size = 1.3

$$\frac{b^2\left(\left(F^{g(fx+e)}\right)^n\right)^2}{2\,ngf\ln(F)}+2\,\frac{ab\left(F^{g(fx+e)}\right)^n}{ngf\ln(F)}+\frac{a^2\ln\left(\left(F^{g(fx+e)}\right)^n\right)}{ngf\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(F^(g*(f*x+e)))^n)^2,x)
```

```
[Out] 1/2/g/f/ln(F)/n*b^2*((F^(g*(f*x+e)))^n)^2+2*a*b*(F^(g*(f*x+e)))^n
/f/g/n/ln(F)+1/g/f/ln(F)/n*a^2*ln((F^(g*(f*x+e)))^n)
```

Maxima [A] time = 0.837926, size = 101, normalized size = 1.51

$$a^2x+\frac{2\left(F^{fgx}\right)^n\left(F^{eg}\right)^nab}{fgn\log(F)}+\frac{\left(F^{fgx}\right)^{2n}\left(F^{eg}\right)^{2n}b^2}{2\,fgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)^2,x, algorithm="maxima")
```

```
[Out] a^2*x + 2*(F^(f*g*x))^n*(F^(e*g))^n*a*b/(f*g*n*log(F)) + 1/2*(F^(
f*g*x))^(2*n)*(F^(e*g))^(2*n)*b^2/(f*g*n*log(F))
```

Fricas [A] time = 0.280398, size = 82, normalized size = 1.22

$$\frac{2\,a^2fgnx\log(F)+4\,F^{fgnx+egn}ab+F^{2\,fgnx+2\,egn}b^2}{2\,fgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)^2,x, algorithm="fricas")
```

```
[Out] 1/2*(2*a^2*f*g*n*x*log(F) + 4*F^(f*g*n*x + e*g*n)*a*b + F^(2*f*g*
n*x + 2*e*g*n)*b^2)/(f*g*n*log(F))
```

Sympy [A] time = 0.378717, size = 94, normalized size = 1.4

$$a^2x + \begin{cases} \frac{4abfgn\left(F^{g(e+fx)}\right)^n \log(F) + b^2fgn\left(F^{g(e+fx)}\right)^{2n} \log(F)}{2f^2g^2n^2\log(F)^2} & \text{for } 2f^2g^2n^2\log(F)^2 \neq 0 \\ x\left(2ab+b^2\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(F**(g*(f*x+e)))**n)**2,x)
```

```
[Out] a**2*x + Piecewise(((4*a*b*f*g*n*(F**(g*(e + f*x)))**n*log(F) + b
**2*f*g*n*(F**(g*(e + f*x)))**(2*n)*log(F))/(2*f**2*g**2*n**2*log
(F)**2), Ne(2*f**2*g**2*n**2*log(F)**2, 0)), (x*(2*a*b + b**2), T
rue))
```

GIAC/XCAS [A] time = 0.282942, size = 914, normalized size = 13.64

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)^2,x, algorithm="giac")
```

```
[Out] a^2*x + (2*b^2*f*g*n*cos(-pi*f*g*n*x*sign(F) + pi*f*g*n*x - pi*g*
n*e*sign(F) + pi*g*n*e)*ln(abs(F))/(4*f^2*g^2*n^2*ln(abs(F))^2 +
(pi*f*g*n*sign(F) - pi*f*g*n)^2) - (pi*f*g*n*sign(F) - pi*f*g*n)*
b^2*sin(-pi*f*g*n*x*sign(F) + pi*f*g*n*x - pi*g*n*e*sign(F) + pi*
g*n*e)/(4*f^2*g^2*n^2*ln(abs(F))^2 + (pi*f*g*n*sign(F) - pi*f*g*n
)^2))*e^(2*f*g*n*x*ln(abs(F)) + 2*g*n*e*ln(abs(F))) - 1/2*I*(-I*b
^2*e^(I*pi*f*g*n*x*sign(F) - I*pi*f*g*n*x + I*pi*g*n*e*sign(F) -
I*pi*g*n*e)/(I*pi*f*g*n*sign(F) - I*pi*f*g*n + 2*f*g*n*ln(abs(F))
) + I*b^2*e^(-I*pi*f*g*n*x*sign(F) + I*pi*f*g*n*x - I*pi*g*n*e*si
gn(F) + I*pi*g*n*e)/(-I*pi*f*g*n*sign(F) + I*pi*f*g*n + 2*f*g*n*l
n(abs(F))))*e^(2*f*g*n*x*ln(abs(F)) + 2*g*n*e*ln(abs(F))) + 4*(2*
a*b*f*g*n*cos(-1/2*pi*f*g*n*x*sign(F) + 1/2*pi*f*g*n*x - 1/2*pi*g
*n*e*sign(F) + 1/2*pi*g*n*e)*ln(abs(F))/(4*f^2*g^2*n^2*ln(abs(F))
```

```
^2 + (pi*f*g*n*sign(F) - pi*f*g*n)^2) - (pi*f*g*n*sign(F) - pi*f*
g*n)*a*b*sin(-1/2*pi*f*g*n*x*sign(F) + 1/2*pi*f*g*n*x - 1/2*pi*g*
n*e*sign(F) + 1/2*pi*g*n*e)/(4*f^2*g^2*n^2*ln(abs(F))^2 + (pi*f*g
*n*sign(F) - pi*f*g*n)^2))*e^(f*g*n*x*ln(abs(F)) + g*n*e*ln(abs(F
))) - 1/2*I*(-4*I*a*b*e^(1/2*I*pi*f*g*n*x*sign(F) - 1/2*I*pi*f*g*
n*x + 1/2*I*pi*g*n*e*sign(F) - 1/2*I*pi*g*n*e)/(I*pi*f*g*n*sign(F
) - I*pi*f*g*n + 2*f*g*n*ln(abs(F))) + 4*I*a*b*e^(-1/2*I*pi*f*g*n
*x*sign(F) + 1/2*I*pi*f*g*n*x - 1/2*I*pi*g*n*e*sign(F) + 1/2*I*pi
*g*n*e)/(-I*pi*f*g*n*sign(F) + I*pi*f*g*n + 2*f*g*n*ln(abs(F))))*
e^(f*g*n*x*ln(abs(F)) + g*n*e*ln(abs(F)))
```

3.36 $\int \frac{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2}{c+dx}\,dx$

Optimal. Leaf size=134

$$\frac{a^2\log(c+dx)}{d}+\frac{2ab\left(F^{eg+fgx}\right)^n F^{gn\left(e-\frac{cf}{d}\right)-gn(e+fx)}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right)}{d}+\frac{b^2\left(F^{eg+fgx}\right)^{2n}F^{2gn\left(e-\frac{cf}{d}\right)-2gn(e+fx)}\text{ExpIntegralEi}\left(\frac{2fgn\log(F)(c+dx)}{d}\right)}{d}$$

```
[Out] (2*a*b*F^((e - (c*f)/d)*g*n - g*n*(e + f*x))*(F^(e*g + f*g*x))^n*
ExpIntegralEi[(f*g*n*(c + d*x)*Log[F])/d])/d + (b^2*F^(2*(e - (c*
f)/d)*g*n - 2*g*n*(e + f*x))*(F^(e*g + f*g*x))^(2*n)*ExpIntegralE
i[(2*f*g*n*(c + d*x)*Log[F])/d])/d + (a^2*Log[c + d*x])/d
```

Rubi [A] time = 0.437741, antiderivative size = 134, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.12

$$\frac{a^2\log(c+dx)}{d}+\frac{2ab\left(F^{eg+fgx}\right)^n F^{gn\left(e-\frac{cf}{d}\right)-gn(e+fx)}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right)}{d}+\frac{b^2\left(F^{eg+fgx}\right)^{2n}F^{2gn\left(e-\frac{cf}{d}\right)-2gn(e+fx)}\text{ExpIntegralEi}\left(\frac{2fgn\log(F)(c+dx)}{d}\right)}{d}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)^2/(c + d*x),x]
```

```
[Out] (2*a*b*F^((e - (c*f)/d)*g*n - g*n*(e + f*x))*(F^(e*g + f*g*x))^n*
ExpIntegralEi[(f*g*n*(c + d*x)*Log[F])/d])/d + (b^2*F^(2*(e - (c*
f)/d)*g*n - 2*g*n*(e + f*x))*(F^(e*g + f*g*x))^(2*n)*ExpIntegralE
i[(2*f*g*n*(c + d*x)*Log[F])/d])/d + (a^2*Log[c + d*x])/d
```

Rubi in Sympy [A] time = 33.9316, size = 138, normalized size = 1.03

$$\frac{F^{gn(-2e-2fx)}F^{-\frac{2gn(cf-de)}{d}}b^2\left(F^{g(e+fx)}\right)^{2n}\operatorname{Ei}\left(\frac{fgn(2c+2dx)\log(F)}{d}\right)}{d}+\frac{2F^{gn(-e-fx)}F^{-\frac{gn(cf-de)}{d}}ab\left(F^{g(e+fx)}\right)^{n}\operatorname{Ei}\left(\frac{fgn(c+dx)\log(F)}{d}\right)}{d}+\frac{a^2\log(c+dx)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(F**(g*(f*x+e)))**n)**2/(d*x+c),x)
```

```
[Out] F**(g*n*(-2*e - 2*f*x))*F**(-2*g*n*(c*f - d*e)/d)*b**2*(F**(g*(e
+ f*x)))**(2*n)*Ei(f*g*n*(2*c + 2*d*x)*log(F)/d)/d + 2*F**(g*n*(-
e - f*x))*F**(-g*n*(c*f - d*e)/d)*a*b*(F**(g*(e + f*x)))**n*Ei(f*
g*n*(c + d*x)*log(F)/d)/d + a**2*log(c + d*x)/d
```

Mathematica [A] time = 0.268717, size = 108, normalized size = 0.81

$$\frac{a^2\log(c+dx)+2ab\left(F^{g(e+fx)}\right)^nF^{-\frac{fgn(c+dx)}{d}}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right)+b^2\left(F^{g(e+fx)}\right)^{2n}F^{-\frac{2fgn(c+dx)}{d}}\text{ExpIntegralEi}\left(\frac{2fg\ldots}{}\right.}{d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)^2/(c + d*x),x]
```

```
[Out] ((2*a*b*(F^(g*(e + f*x)))^n*ExpIntegralEi[(f*g*n*(c + d*x)*Log[F]
)/d])/F^((f*g*n*(c + d*x))/d) + (b^2*(F^(g*(e + f*x)))^(2*n)*ExpI
ntegralEi[(2*f*g*n*(c + d*x)*Log[F])/d])/F^((2*f*g*n*(c + d*x))/d
) + a^2*Log[c + d*x])/d
```

Maple [F] time = 0.079, size = 0, normalized size = 0.

$$\int \frac{\left(a+b\left(F^{g(fx+e)}\right)^n\right)^2}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(F^(g*(f*x+e)))^n)^2/(d*x+c),x)
```

```
[Out] int((a+b*(F^(g*(f*x+e)))^n)^2/(d*x+c),x)
```

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

$$\left(F^{eg}\right)^{2n}b^2\int \frac{\left(F^{fgx}\right)^{2n}}{dx+c}\,dx+2\left(F^{eg}\right)^n ab\int \frac{\left(F^{fgx}\right)^n}{dx+c}\,dx+\frac{a^2\log\left(dx+c\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^2/(d*x + c),x, algorithm="maxima")
```

```
[Out] (F^(e*g))^(2*n)*b^2*integrate((F^(f*g*x))^(2*n)/(d*x + c), x) + 2
*(F^(e*g))^n*a*b*integrate((F^(f*g*x))^n/(d*x + c), x) + a^2*log(
d*x + c)/d
```

Fricas [A] time = 0.255247, size = 128, normalized size = 0.96

$$\frac{F^{\frac{2(de-cf)gn}{d}}b^2\text{Ei}\left(\frac{2(dfgnx+cfgn)\log(F)}{d}\right)+2F^{\frac{(de-cf)gn}{d}}ab\text{Ei}\left(\frac{(dfgnx+cfgn)\log(F)}{d}\right)+a^2\log(dx+c)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^2/(d*x + c),x, algorithm="fricas")
```

```
[Out] (F^(2*(d*e - c*f)*g*n/d)*b^2*Ei(2*(d*f*g*n*x + c*f*g*n)*log(F)/d)
 + 2*F^((d*e - c*f)*g*n/d)*a*b*Ei((d*f*g*n*x + c*f*g*n)*log(F)/d)
 + a^2*log(d*x + c))/d
```

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

$$\int \frac{\left(a+b\left(F^{eg}F^{fgx}\right)^{n}\right)^{2}}{c+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*(F**(g*(f*x+e)))**n)**2/(d*x+c),x)
```

```
[Out] Integral((a + b*(F**(e*g)*F**(f*g*x))**n)**2/(c + d*x), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(\left(F^{(fx+e)g}\right)^{n}b+a\right)^{2}}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)^2/(d*x + c),x, algorithm="giac")

[Out] integrate(((F^((f*x + e)*g))^n*b + a)^2/(d*x + c), x)
```

3.37 $\int \frac{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2}{(c+dx)^2}\,dx$

Optimal. Leaf size=202

$$-\frac{a^2}{d(c+dx)}+\frac{2abfgn\log(F)\left(F^{eg+fgx}\right)^n F^{gn\left(e-\frac{cf}{d}\right)-gn(e+fx)}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right)}{d^2}-\frac{2ab\left(F^{eg+fgx}\right)^n}{d(c+dx)}+\frac{2b^2fgn\log(F)\left(F^{eg+fgx}\right)^{2n}F^{2gn\left(e-\frac{cf}{d}\right)-2gn(e+fx)}\text{ExpIntegralEi}\left(\frac{2fgn\log(F)(c+dx)}{d}\right)}{d^2}-\frac{b^2\left(F^{eg+fgx}\right)^{2n}}{d(c+dx)}$$

```
[Out] -(a^2/(d*(c + d*x))) - (2*a*b*(F^(e*g + f*g*x))^n)/(d*(c + d*x))
- (b^2*(F^(e*g + f*g*x))^(2*n))/(d*(c + d*x)) + (2*a*b*f*F^((e -
(c*f)/d)*g*n - g*n*(e + f*x))*(F^(e*g + f*g*x))^n*g*n*ExpIntegral
Ei[(f*g*n*(c + d*x)*Log[F])/d]*Log[F])/d^2 + (2*b^2*f*F^(2*(e - (
c*f)/d)*g*n - 2*g*n*(e + f*x))*(F^(e*g + f*g*x))^(2*n)*g*n*ExpInt
egralEi[(2*f*g*n*(c + d*x)*Log[F])/d]*Log[F])/d^2
```

Rubi [A] time = 0.588462, antiderivative size = 202, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.16$

$$-\frac{a^2}{d(c+dx)}+\frac{2abfgn\log(F)\left(F^{eg+fgx}\right)^n F^{gn\left(e-\frac{cf}{d}\right)-gn(e+fx)}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right)}{d^2}-\frac{2ab\left(F^{eg+fgx}\right)^n}{d(c+dx)}+\frac{2b^2fgn\log(F)\left(F^{eg+fgx}\right)^{2n}F^{2gn\left(e-\frac{cf}{d}\right)-2gn(e+fx)}\text{ExpIntegralEi}\left(\frac{2fgn\log(F)(c+dx)}{d}\right)}{d^2}-\frac{b^2\left(F^{eg+fgx}\right)^{2n}}{d(c+dx)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)^2/(c + d*x)^2,x]
```

```
[Out] -(a^2/(d*(c + d*x))) - (2*a*b*(F^(e*g + f*g*x))^n)/(d*(c + d*x))
- (b^2*(F^(e*g + f*g*x))^(2*n))/(d*(c + d*x)) + (2*a*b*f*F^((e -
```

```
(c*f)/d)*g*n - g*n*(e + f*x))*(F^(e*g + f*g*x))^n*g*n*ExpIntegral
Ei[(f*g*n*(c + d*x)*Log[F])/d]*Log[F])/d^2 + (2*b^2*f*F^(2*(e - (
c*f)/d)*g*n - 2*g*n*(e + f*x))*(F^(e*g + f*g*x))^(2*n)*g*n*ExpInt
egralEi[(2*f*g*n*(c + d*x)*Log[F])/d]*Log[F])/d^2
```

Rubi in Sympy [A] time = 48.1219, size = 202, normalized size = 1.

$$\frac{2F^{gn(-2e-2fx)}F^{-\frac{2gn(cf-de)}{d}}b^2fgn\left(F^{g(e+fx)}\right)^{2n}\log(F)\operatorname{Ei}\left(\frac{fgn(2c+2dx)\log(F)}{d}\right)}{d^2}+\frac{2F^{gn(-e-fx)}F^{-\frac{gn(cf-de)}{d}}abfgn\left(F^{g(e+fx)}\right)^{n}\log(F)\operatorname{Ei}\left(\frac{fgn(c+dx)\log(F)}{d}\right)}{d^2}-\frac{a^2}{d(c+dx)}-\frac{2ab\left(F^{g(e+fx)}\right)^n}{d(c+dx)}-\frac{b^2\left(F^{g(e+fx)}\right)^{2n}}{d(c+dx)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(F**(g*(f*x+e)))**n)**2/(d*x+c)**2,x)
```

```
[Out] 2*F**(g*n*(-2*e - 2*f*x))*F**(-2*g*n*(c*f - d*e)/d)*b**2*f*g*n*(F
**(g*(e + f*x)))**(2*n)*log(F)*Ei(f*g*n*(2*c + 2*d*x)*log(F)/d)/d
**2 + 2*F**(g*n*(-e - f*x))*F**(-g*n*(c*f - d*e)/d)*a*b*f*g*n*(F*
*(g*(e + f*x)))**n*log(F)*Ei(f*g*n*(c + d*x)*log(F)/d)/d**2 - a**
2/(d*(c + d*x)) - 2*a*b*(F**(g*(e + f*x)))**n/(d*(c + d*x)) - b**
2*(F**(g*(e + f*x)))**(2*n)/(d*(c + d*x))
```

Mathematica [A] time = 0.812669, size = 136, normalized size = 0.67

$$\frac{2abfgn\log(F)\left(F^{g(e+fx)}\right)^nF^{-\frac{fgn(c+dx)}{d}}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right)-\frac{d\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2}{c+dx}+2b^2fgn\log(F)\left(F^{g(e+fx)}\right)^{2n}F^{-2}}{d^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)^2/(c + d*x)^2,x]
```

```
[Out] (-((d*(a + b*(F^(g*(e + f*x)))^n)^2)/(c + d*x)) + (2*a*b*f*(F^(g*
(e + f*x)))^n*g*n*ExpIntegralEi[(f*g*n*(c + d*x)*Log[F])/d]*Log[F
])/F^((f*g*n*(c + d*x))/d) + (2*b^2*f*(F^(g*(e + f*x)))^(2*n)*g*n
*ExpIntegralEi[(2*f*g*n*(c + d*x)*Log[F])/d]*Log[F])/F^((2*f*g*n*
(c + d*x))/d))/d^2
```

Maple [F] time = 0.032, size = 0, normalized size = 0.

$$\int \frac{\left(a+b\left(F^{g(fx+e)}\right)^{n}\right)^{2}}{(dx+c)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(F^(g*(f*x+e)))^n)^2/(d*x+c)^2,x)
```

```
[Out] int((a+b*(F^(g*(f*x+e)))^n)^2/(d*x+c)^2,x)
```

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

$$\left(F^{eg}\right)^{2n}b^{2}\int \frac{\left(F^{fgx}\right)^{2n}}{d^{2}x^{2}+2\,cdx+c^{2}}\,dx+2\left(F^{eg}\right)^{n}ab\int \frac{\left(F^{fgx}\right)^{n}}{d^{2}x^{2}+2\,cdx+c^{2}}\,dx-\frac{a^{2}}{d^{2}x+cd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^2/(d*x + c)^2,x, algorithm="maxima")
```

```
[Out] (F^(e*g))^(2*n)*b^2*integrate((F^(f*g*x))^(2*n)/(d^2*x^2 + 2*c*d*
x + c^2), x) + 2*(F^(e*g))^n*a*b*integrate((F^(f*g*x))^n/(d^2*x^2
 + 2*c*d*x + c^2), x) - a^2/(d^2*x + c*d)
```

Fricas [A] time = 0.279562, size = 231, normalized size = 1.14

$$-\frac{2\,F^{fgnx+egn}abd+F^{2\,fgnx+2\,egn}b^{2}d-2\left(b^{2}dfgnx+b^{2}cfgn\right)F^{\frac{2(de-cf)gn}{d}}\,\mathrm{Ei}\left(\frac{2\,(dfgnx+cfgn)\log(F)}{d}\right)\log\left(F\right)-2\left(abdfgnx+abc\right.}{d^{3}x+cd^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^2/(d*x + c)^2,x, algorithm="fricas")
```

```
[Out] -(2*F^(f*g*n*x + e*g*n)*a*b*d + F^(2*f*g*n*x + 2*e*g*n)*b^2*d - 2
*(b^2*d*f*g*n*x + b^2*c*f*g*n)*F^(2*(d*e - c*f)*g*n/d)*Ei(2*(d*f*
g*n*x + c*f*g*n)*log(F)/d)*log(F) - 2*(a*b*d*f*g*n*x + a*b*c*f*g*
n)*F^((d*e - c*f)*g*n/d)*Ei((d*f*g*n*x + c*f*g*n)*log(F)/d)*log(F
) + a^2*d)/(d^3*x + c*d^2)
```

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

$$\int \frac{\left(a+b\left(F^{eg}F^{fgx}\right)^{n}\right)^{2}}{(c+dx)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(F**(g*(f*x+e)))**n)**2/(d*x+c)**2,x)
```

```
[Out] Integral((a + b*(F**(e*g)*F**(f*g*x))**n)**2/(c + d*x)**2, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(\left(F^{(fx+e)g}\right)^{n}b+a\right)^{2}}{(dx+c)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^2/(d*x + c)^2,x, algorithm="giac")
```

```
[Out] integrate(((F^((f*x + e)*g))^n*b + a)^2/(d*x + c)^2, x)
```

3.38 $\int \frac{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2}{(c+dx)^3}\,dx$

Optimal. Leaf size=286

$$-\frac{a^2}{2d(c+dx)^2}+\frac{abf^2g^2n^2\log^2(F)\left(F^{eg+fgx}\right)^nF^{gn\left(e-\frac{cf}{d}\right)-gn(e+fx)}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right)}{d^3}-\frac{abfgn\log(F)\left(F^{eg+fgx}\right)^n}{d^2(c+dx)}-\frac{ab\left(F^{eg+fgx}\right)^n}{d(c+dx)^2}+\frac{2b^2f^2g^2n^2\log^2(F)\left(F^{eg+fgx}\right)^{2n}F^{2gn\left(e-\frac{cf}{d}\right)-2gn(e+fx)}\text{ExpIntegralEi}\left(\frac{2fgn\log(F)(c+dx)}{d}\right)}{d^3}-\frac{b^2fgn\log(F)\left(F^{eg+fgx}\right)^{2n}}{d^2(c+dx)}-\frac{b^2\left(F^{eg+fgx}\right)^{2n}}{2d(c+dx)^2}$$

```
[Out] -a^2/(2*d*(c + d*x)^2) - (a*b*(F^(e*g + f*g*x))^n)/(d*(c + d*x)^2
) - (b^2*(F^(e*g + f*g*x))^(2*n))/(2*d*(c + d*x)^2) - (a*b*f*(F^(
e*g + f*g*x))^n*g*n*Log[F])/(d^2*(c + d*x)) - (b^2*f*(F^(e*g + f*
g*x))^(2*n)*g*n*Log[F])/(d^2*(c + d*x)) + (a*b*f^2*F^((e - (c*f)/
d)*g*n - g*n*(e + f*x))*(F^(e*g + f*g*x))^n*g^2*n^2*ExpIntegralEi
[(f*g*n*(c + d*x)*Log[F])/d]*Log[F]^2)/d^3 + (2*b^2*f^2*F^(2*(e -
 (c*f)/d)*g*n - 2*g*n*(e + f*x))*(F^(e*g + f*g*x))^(2*n)*g^2*n^2*
ExpIntegralEi[(2*f*g*n*(c + d*x)*Log[F])/d]*Log[F]^2)/d^3
```

Rubi [A] time = 0.81929, antiderivative size = 286, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.16

$$-\frac{a^2}{2d(c+dx)^2}+\frac{abf^2g^2n^2\log^2(F)\left(F^{eg+fgx}\right)^nF^{gn\left(e-\frac{cf}{d}\right)-gn(e+fx)}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right)}{d^3}-\frac{abfgn\log(F)\left(F^{eg+fgx}\right)^n}{d^2(c+dx)}-\frac{ab\left(F^{eg+fgx}\right)^n}{d(c+dx)^2}+\frac{2b^2f^2g^2n^2\log^2(F)\left(F^{eg+fgx}\right)^{2n}F^{2gn\left(e-\frac{cf}{d}\right)-2gn(e+fx)}\text{ExpIntegralEi}\left(\frac{2fgn\log(F)(c+dx)}{d}\right)}{d^3}-\frac{b^2fgn\log(F)\left(F^{eg+fgx}\right)^{2n}}{d^2(c+dx)}-\frac{b^2\left(F^{eg+fgx}\right)^{2n}}{2d(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)^2/(c + d*x)^3,x]
```

```
[Out] -a^2/(2*d*(c + d*x)^2) - (a*b*(F^(e*g + f*g*x))^n)/(d*(c + d*x)^2
) - (b^2*(F^(e*g + f*g*x))^(2*n))/(2*d*(c + d*x)^2) - (a*b*f*(F^(
e*g + f*g*x))^n*g*n*Log[F])/(d^2*(c + d*x)) - (b^2*f*(F^(e*g + f*
g*x))^(2*n)*g*n*Log[F])/(d^2*(c + d*x)) + (a*b*f^2*F^((e - (c*f)/
d)*g*n - g*n*(e + f*x))*(F^(e*g + f*g*x))^n*g^2*n^2*ExpIntegralEi
[(f*g*n*(c + d*x)*Log[F])/d]*Log[F]^2)/d^3 + (2*b^2*f^2*F^(2*(e -
 (c*f)/d)*g*n - 2*g*n*(e + f*x))*(F^(e*g + f*g*x))^(2*n)*g^2*n^2*
ExpIntegralEi[(2*f*g*n*(c + d*x)*Log[F])/d]*Log[F]^2)/d^3
```

Rubi in Sympy [A] time = 78.4537, size = 284, normalized size = 0.99

$$\frac{2F^{gn(-2e-2fx)}F^{-\frac{2gn(cf-de)}{d}}b^2f^2g^2n^2\left(F^{g(e+fx)}\right)^{2n}\log(F)^2\operatorname{Ei}\left(\frac{fgn(2c+2dx)\log(F)}{d}\right)}{d^3}+\frac{F^{gn(-e-fx)}F^{-\frac{gn(cf-de)}{d}}abf^2g^2n^2\left(F^{g(e+fx)}\right)^{n}\log(F)^2\operatorname{Ei}\left(\frac{fgn(c+dx)\log(F)}{d}\right)}{d^3}-\frac{a^2}{2d(c+dx)^2}-\frac{ab\left(F^{g(e+fx)}\right)^n}{d(c+dx)^2}-\frac{abfgn\left(F^{g(e+fx)}\right)^n\log(F)}{d^2(c+dx)}-\frac{b^2\left(F^{g(e+fx)}\right)^{2n}}{2d(c+dx)^2}-\frac{b^2fgn\left(F^{g(e+fx)}\right)^{2n}\log(F)}{d^2(c+dx)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(F**(g*(f*x+e)))**n)**2/(d*x+c)**3,x)
```

```
[Out] 2*F**(g*n*(-2*e - 2*f*x))*F**(-2*g*n*(c*f - d*e)/d)*b**2*f**2*g**
2*n**2*(F**(g*(e + f*x)))**(2*n)*log(F)**2*Ei(f*g*n*(2*c + 2*d*x)
*log(F)/d)/d**3 + F**(g*n*(-e - f*x))*F**(-g*n*(c*f - d*e)/d)*a*b
*f**2*g**2*n**2*(F**(g*(e + f*x)))**n*log(F)**2*Ei(f*g*n*(c + d*x
)*log(F)/d)/d**3 - a**2/(2*d*(c + d*x)**2) - a*b*(F**(g*(e + f*x)
))**n/(d*(c + d*x)**2) - a*b*f*g*n*(F**(g*(e + f*x)))**n*log(F)/(
d**2*(c + d*x)) - b**2*(F**(g*(e + f*x)))**(2*n)/(2*d*(c + d*x)**
2) - b**2*f*g*n*(F**(g*(e + f*x)))**(2*n)*log(F)/(d**2*(c + d*x))
```

Mathematica [A] time = 0.601048, size = 217, normalized size = 0.76

$$-\frac{a^2d^2-2abf^2g^2n^2\log^2(F)(c+dx)^2\left(F^{g(e+fx)}\right)^nF^{-\frac{fgn(c+dx)}{d}}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right)+2abd\left(F^{g(e+fx)}\right)^n(fgn\log(F)(\cdots}{\cdots}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)^2/(c + d*x)^3,x]
```

```
[Out] -(a^2*d^2 - (2*a*b*f^2*(F^(g*(e + f*x)))^n*g^2*n^2*(c + d*x)^2*Ex
pIntegralEi[(f*g*n*(c + d*x)*Log[F])/d]*Log[F]^2)/F^((f*g*n*(c +
d*x))/d) - (4*b^2*f^2*(F^(g*(e + f*x)))^(2*n)*g^2*n^2*(c + d*x)^2
*ExpIntegralEi[(2*f*g*n*(c + d*x)*Log[F])/d]*Log[F]^2)/F^((2*f*g*
n*(c + d*x))/d) + 2*a*b*d*(F^(g*(e + f*x)))^n*(d + f*g*n*(c + d*x
)*Log[F]) + b^2*d*(F^(g*(e + f*x)))^(2*n)*(d + 2*f*g*n*(c + d*x)*
Log[F]))/(2*d^3*(c + d*x)^2)
```

Maple [F] time = 0.032, size = 0, normalized size = 0.

$$\int \frac{\left(a + b\left(F^{g(fx+e)}\right)^{n}\right)^{2}}{(dx + c)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(F^(g*(f*x+e)))^n)^2/(d*x+c)^3,x)
```

```
[Out] int((a+b*(F^(g*(f*x+e)))^n)^2/(d*x+c)^3,x)
```

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

$$\left(F^{eg}\right)^{2n} b^{2} \int \frac{\left(F^{fgx}\right)^{2n}}{d^{3}x^{3} + 3\,cd^{2}x^{2} + 3\,c^{2}dx + c^{3}}\, dx + 2\left(F^{eg}\right)^{n} ab \int \frac{\left(F^{fgx}\right)^{n}}{d^{3}x^{3} + 3\,cd^{2}x^{2} + 3\,c^{2}dx + c^{3}}\, dx - \frac{a^{2}}{2\left(d^{3}x^{2} + 2\,cd^{2}x + c^{2}d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^2/(d*x + c)^3,x, algorithm="maxima")
```

```
[Out] (F^(e*g))^(2*n)*b^2*integrate((F^(f*g*x))^(2*n)/(d^3*x^3 + 3*c*d^
2*x^2 + 3*c^2*d*x + c^3), x) + 2*(F^(e*g))^n*a*b*integrate((F^(f*
g*x))^n/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3), x) - 1/2*a^2/(
d^3*x^2 + 2*c*d^2*x + c^2*d)
```

Fricas [A] time = 0.282474, size = 424, normalized size = 1.48

$$4\left(b^{2}d^{2}f^{2}g^{2}n^{2}x^{2} + 2\,b^{2}cdf^{2}g^{2}n^{2}x + b^{2}c^{2}f^{2}g^{2}n^{2}\right)F^{\frac{2(de-cf)gn}{d}}\operatorname{Ei}\left(\frac{2\,(dfgnx+cfgn)\log(F)}{d}\right)\log(F)^{2} + 2\left(abd^{2}f^{2}g^{2}n^{2}x^{2} + 2\,abcdf^{2}g\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^2/(d*x + c)^3,x, algorithm="fricas")
```

```
[Out] 1/2*(4*(b^2*d^2*f^2*g^2*n^2*x^2 + 2*b^2*c*d*f^2*g^2*n^2*x + b^2*c
^2*f^2*g^2*n^2)*F^(2*(d*e - c*f)*g*n/d)*Ei(2*(d*f*g*n*x + c*f*g*n
)*log(F)/d)*log(F)^2 + 2*(a*b*d^2*f^2*g^2*n^2*x^2 + 2*a*b*c*d*f^2
*g^2*n^2*x + a*b*c^2*f^2*g^2*n^2)*F^((d*e - c*f)*g*n/d)*Ei((d*f*g
*n*x + c*f*g*n)*log(F)/d)*log(F)^2 - a^2*d^2 - (b^2*d^2 + 2*(b^2*
d^2*f*g*n*x + b^2*c*d*f*g*n)*log(F))*F^(2*f*g*n*x + 2*e*g*n) - 2*
(a*b*d^2 + (a*b*d^2*f*g*n*x + a*b*c*d*f*g*n)*log(F))*F^(f*g*n*x +
 e*g*n))/(d^5*x^2 + 2*c*d^4*x + c^2*d^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*(F**(g*(f*x+e)))**n)**2/(d*x+c)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(\left(F^{(fx+e)g}\right)^n b + a\right)^2}{(dx+c)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^2/(d*x + c)^3,x, algorithm="giac")
```

```
[Out] integrate(((F^((f*x + e)*g))^n*b + a)^2/(d*x + c)^3, x)
```

3.39 $\int \left(a+b \left(F^{g(e+fx)}\right)^n\right)^3 (c+dx)^3 \, dx$

Optimal. Leaf size=496

$$\frac{a^3(c+dx)^4}{4d}+\frac{18a^2bd^2(c+dx)\left(F^{eg+fgx}\right)^n}{f^3g^3n^3\log^3(F)}-\frac{9a^2bd(c+dx)^2\left(F^{eg+fgx}\right)^n}{f^2g^2n^2\log^2(F)}+\frac{3a^2b(c+dx)^3\left(F^{eg+fgx}\right)^n}{fgn\log(F)}-\frac{18a^2bd^3\left(F^{eg+fgx}\right)^n}{f^4g^4n^4\log^4(F)}+\frac{9ab^2d^2(c+dx)\left(F^{eg+fgx}\right)^{2n}}{4f^3g^3n^3\log^3(F)}-\frac{9ab^2d(c+dx)^2\left(F^{eg+fgx}\right)^{2n}}{4f^2g^2n^2\log^2(F)}+\frac{3ab^2(c+dx)^3\left(F^{eg+fgx}\right)^{2n}}{2fgn\log(F)}-\frac{9ab^2d^3\left(F^{eg+fgx}\right)^{2n}}{8f^4g^4n^4\log^4(F)}+\frac{2b^3d^2(c+dx)\left(F^{eg+fgx}\right)^{3n}}{9f^3g^3n^3\log^3(F)}-\frac{b^3d(c+dx)^2\left(F^{eg+fgx}\right)^{3n}}{3f^2g^2n^2\log^2(F)}+\frac{b^3(c+dx)^3\left(F^{eg+fgx}\right)^{3n}}{3fgn\log(F)}-\frac{2b^3d^3\left(F^{eg+fgx}\right)^{3n}}{27f^4g^4n^4\log^4(F)}$$

```
[Out] (a^3*(c + d*x)^4)/(4*d) - (18*a^2*b*d^3*(F^(e*g + f*g*x))^n)/(f^4
*g^4*n^4*Log[F]^4) - (9*a*b^2*d^3*(F^(e*g + f*g*x))^(2*n))/(8*f^4
*g^4*n^4*Log[F]^4) - (2*b^3*d^3*(F^(e*g + f*g*x))^(3*n))/(27*f^4*
g^4*n^4*Log[F]^4) + (18*a^2*b*d^2*(F^(e*g + f*g*x))^n*(c + d*x))/
(f^3*g^3*n^3*Log[F]^3) + (9*a*b^2*d^2*(F^(e*g + f*g*x))^(2*n)*(c
+ d*x))/(4*f^3*g^3*n^3*Log[F]^3) + (2*b^3*d^2*(F^(e*g + f*g*x))^(
3*n)*(c + d*x))/(9*f^3*g^3*n^3*Log[F]^3) - (9*a^2*b*d*(F^(e*g + f
*g*x))^n*(c + d*x)^2)/(f^2*g^2*n^2*Log[F]^2) - (9*a*b^2*d*(F^(e*g
 + f*g*x))^(2*n)*(c + d*x)^2)/(4*f^2*g^2*n^2*Log[F]^2) - (b^3*d*(
F^(e*g + f*g*x))^(3*n)*(c + d*x)^2)/(3*f^2*g^2*n^2*Log[F]^2) + (3
*a^2*b*(F^(e*g + f*g*x))^n*(c + d*x)^3)/(f*g*n*Log[F]) + (3*a*b^2
*(F^(e*g + f*g*x))^(2*n)*(c + d*x)^3)/(2*f*g*n*Log[F]) + (b^3*(F^
(e*g + f*g*x))^(3*n)*(c + d*x)^3)/(3*f*g*n*Log[F])
```

Rubi [A] time = 1.23806, antiderivative size = 496, normalized size of antiderivative = 1., number of

steps used = 14, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.12$

$$\frac{a^3(c+dx)^4}{4d} + \frac{18a^2bd^2(c+dx)\left(F^{eg+fgx}\right)^n}{f^3g^3n^3\log^3(F)} - \frac{9a^2bd(c+dx)^2\left(F^{eg+fgx}\right)^n}{f^2g^2n^2\log^2(F)} + \frac{3a^2b(c+dx)^3\left(F^{eg+fgx}\right)^n}{fgn\log(F)} - \frac{18a^2bd^3\left(F^{eg+fgx}\right)^n}{f^4g^4n^4\log^4(F)} + \frac{9ab^2d^2(c+dx)\left(F^{eg+fgx}\right)^{2n}}{4f^3g^3n^3\log^3(F)} - \frac{9ab^2d(c+dx)^2\left(F^{eg+fgx}\right)^{2n}}{4f^2g^2n^2\log^2(F)} + \frac{3ab^2(c+dx)^3\left(F^{eg+fgx}\right)^{2n}}{2fgn\log(F)} - \frac{9ab^2d^3\left(F^{eg+fgx}\right)^{2n}}{8f^4g^4n^4\log^4(F)} + \frac{2b^3d^2(c+dx)\left(F^{eg+fgx}\right)^{3n}}{9f^3g^3n^3\log^3(F)} - \frac{b^3d(c+dx)^2\left(F^{eg+fgx}\right)^{3n}}{3f^2g^2n^2\log^2(F)} + \frac{b^3(c+dx)^3\left(F^{eg+fgx}\right)^{3n}}{3fgn\log(F)} - \frac{2b^3d^3\left(F^{eg+fgx}\right)^{3n}}{27f^4g^4n^4\log^4(F)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)^3*(c + d*x)^3,x]
```

```
[Out] (a^3*(c + d*x)^4)/(4*d) - (18*a^2*b*d^3*(F^(e*g + f*g*x))^n)/(f^4
*g^4*n^4*Log[F]^4) - (9*a*b^2*d^3*(F^(e*g + f*g*x))^(2*n))/(8*f^4
*g^4*n^4*Log[F]^4) - (2*b^3*d^3*(F^(e*g + f*g*x))^(3*n))/(27*f^4*
g^4*n^4*Log[F]^4) + (18*a^2*b*d^2*(F^(e*g + f*g*x))^n*(c + d*x))/
(f^3*g^3*n^3*Log[F]^3) + (9*a*b^2*d^2*(F^(e*g + f*g*x))^(2*n)*(c
+ d*x))/(4*f^3*g^3*n^3*Log[F]^3) + (2*b^3*d^2*(F^(e*g + f*g*x))^(
3*n)*(c + d*x))/(9*f^3*g^3*n^3*Log[F]^3) - (9*a^2*b*d*(F^(e*g + f
*g*x))^n*(c + d*x)^2)/(f^2*g^2*n^2*Log[F]^2) - (9*a*b^2*d*(F^(e*g
 + f*g*x))^(2*n)*(c + d*x)^2)/(4*f^2*g^2*n^2*Log[F]^2) - (b^3*d*(
F^(e*g + f*g*x))^(3*n)*(c + d*x)^2)/(3*f^2*g^2*n^2*Log[F]^2) + (3
*a^2*b*(F^(e*g + f*g*x))^n*(c + d*x)^3)/(f*g*n*Log[F]) + (3*a*b^2
*(F^(e*g + f*g*x))^(2*n)*(c + d*x)^3)/(2*f*g*n*Log[F]) + (b^3*(F^
(e*g + f*g*x))^(3*n)*(c + d*x)^3)/(3*f*g*n*Log[F])
```

Rubi in Sympy [A] time = 174.116, size = 478, normalized size = 0.96

$$\frac{a^3\left(c+dx\right)^4}{4d} - \frac{18a^2bd^3\left(F^{g(e+fx)}\right)^n}{f^4g^4n^4\log\left(F\right)^4} + \frac{18a^2bd^2\left(c+dx\right)\left(F^{g(e+fx)}\right)^n}{f^3g^3n^3\log\left(F\right)^3} - \frac{9a^2bd\left(c+dx\right)^2\left(F^{g(e+fx)}\right)^n}{f^2g^2n^2\log\left(F\right)^2} + \frac{3a^2b\left(c+dx\right)^3\left(F^{g(e+fx)}\right)^n}{fgn\log\left(F\right)} - \frac{9ab^2d^3\left(F^{g(e+fx)}\right)^{2n}}{8f^4g^4n^4\log\left(F\right)^4} + \frac{9ab^2d^2\left(c+dx\right)\left(F^{g(e+fx)}\right)^{2n}}{4f^3g^3n^3\log\left(F\right)^3} - \frac{9ab^2d\left(c+dx\right)^2\left(F^{g(e+fx)}\right)^{2n}}{4f^2g^2n^2\log\left(F\right)^2} + \frac{3ab^2\left(c+dx\right)^3\left(F^{g(e+fx)}\right)^{2n}}{2fgn\log\left(F\right)} - \frac{2b^3d^3\left(F^{g(e+fx)}\right)^{3n}}{27f^4g^4n^4\log\left(F\right)^4} + \frac{2b^3d^2\left(c+dx\right)\left(F^{g(e+fx)}\right)^{3n}}{9f^3g^3n^3\log\left(F\right)^3} - \frac{b^3d\left(c+dx\right)^2\left(F^{g(e+fx)}\right)^{3n}}{3f^2g^2n^2\log\left(F\right)^2} + \frac{b^3\left(c+dx\right)^3\left(F^{g(e+fx)}\right)^{3n}}{3fgn\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(F**(g*(f*x+e)))**n)**3*(d*x+c)**3,x)
```

```
[Out] a**3*(c + d*x)**4/(4*d) - 18*a**2*b*d**3*(F**(g*(e + f*x)))**n/(f
**4*g**4*n**4*log(F)**4) + 18*a**2*b*d**2*(c + d*x)*(F**(g*(e + f
*x)))**n/(f**3*g**3*n**3*log(F)**3) - 9*a**2*b*d*(c + d*x)**2*(F*
*(g*(e + f*x)))**n/(f**2*g**2*n**2*log(F)**2) + 3*a**2*b*(c + d*x
)**3*(F**(g*(e + f*x)))**n/(f*g*n*log(F)) - 9*a*b**2*d**3*(F**(g*
(e + f*x)))**(2*n)/(8*f**4*g**4*n**4*log(F)**4) + 9*a*b**2*d**2*(
c + d*x)*(F**(g*(e + f*x)))**(2*n)/(4*f**3*g**3*n**3*log(F)**3) -
 9*a*b**2*d*(c + d*x)**2*(F**(g*(e + f*x)))**(2*n)/(4*f**2*g**2*n
**2*log(F)**2) + 3*a*b**2*(c + d*x)**3*(F**(g*(e + f*x)))**(2*n)/
(2*f*g*n*log(F)) - 2*b**3*d**3*(F**(g*(e + f*x)))**(3*n)/(27*f**4
*g**4*n**4*log(F)**4) + 2*b**3*d**2*(c + d*x)*(F**(g*(e + f*x)))*
*(3*n)/(9*f**3*g**3*n**3*log(F)**3) - b**3*d*(c + d*x)**2*(F**(g*
(e + f*x)))**(3*n)/(3*f**2*g**2*n**2*log(F)**2) + b**3*(c + d*x)*
*3*(F**(g*(e + f*x)))**(3*n)/(3*f*g*n*log(F))
```

Mathematica [A] time = 0.581917, size = 341, normalized size = 0.69

$$a^3c^3x+\frac{3}{2}a^3c^2dx^2+a^3cd^2x^3+\frac{1}{4}a^3d^3x^4+\frac{3a^2b\left(F^{g(e+fx)}\right)^n\left(6d^2fgn\log(F)(c+dx)+f^3g^3n^3\log^3(F)(c+dx)^3-3df^2g^2n^2\log^2(F)(c+dx)^2-6d^3\right)}{f^4g^4n^4\log^4(F)}+\frac{3ab^2\left(F^{g(e+fx)}\right)^{2n}\left(6d^2fgn\log(F)(c+dx)+4f^3g^3n^3\log^3(F)(c+dx)^3-6df^2g^2n^2\log^2(F)(c+dx)^2-3d^3\right)}{8f^4g^4n^4\log^4(F)}+\frac{b^3\left(F^{g(e+fx)}\right)^{3n}\left(6d^2fgn\log(F)(c+dx)+9f^3g^3n^3\log^3(F)(c+dx)^3-9df^2g^2n^2\log^2(F)(c+dx)^2-2d^3\right)}{27f^4g^4n^4\log^4(F)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)^3*(c + d*x)^3,x]
```

```
[Out] a^3*c^3*x + (3*a^3*c^2*d*x^2)/2 + a^3*c*d^2*x^3 + (a^3*d^3*x^4)/4
 + (3*a^2*b*(F^(g*(e + f*x)))^n*(-6*d^3 + 6*d^2*f*g*n*(c + d*x)*L
og[F] - 3*d*f^2*g^2*n^2*(c + d*x)^2*Log[F]^2 + f^3*g^3*n^3*(c + d
*x)^3*Log[F]^3))/(f^4*g^4*n^4*Log[F]^4) + (3*a*b^2*(F^(g*(e + f*x
)))^(2*n)*(-3*d^3 + 6*d^2*f*g*n*(c + d*x)*Log[F] - 6*d*f^2*g^2*n^
2*(c + d*x)^2*Log[F]^2 + 4*f^3*g^3*n^3*(c + d*x)^3*Log[F]^3))/(8*
f^4*g^4*n^4*Log[F]^4) + (b^3*(F^(g*(e + f*x)))^(3*n)*(-2*d^3 + 6*
d^2*f*g*n*(c + d*x)*Log[F] - 9*d*f^2*g^2*n^2*(c + d*x)^2*Log[F]^2
 + 9*f^3*g^3*n^3*(c + d*x)^3*Log[F]^3))/(27*f^4*g^4*n^4*Log[F]^4)
```

Maple [F] time = 0.032, size = 0, normalized size = 0.

$$\int \left(a + b \left(F^{g(fx+e)}\right)^n\right)^3 (dx + c)^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(F^(g*(f*x+e)))^n)^3*(d*x+c)^3,x)
```

```
[Out] int((a+b*(F^(g*(f*x+e)))^n)^3*(d*x+c)^3,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^3*(d*x + c)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.304978, size = 956, normalized size = 1.93

$$\frac{54 \left(a^3 d^3 f^4 g^4 n^4 x^4 + 4 a^3 c d^2 f^4 g^4 n^4 x^3 + 6 a^3 c^2 d f^4 g^4 n^4 x^2 + 4 a^3 c^3 f^4 g^4 n^4 x\right) \log(F)^4 - 8 \left(2 b^3 d^3 - 9 \left(b^3 d^3 f^3 g^3 n^3 x^3 + 3 b^3 c d^2\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^3*(d*x + c)^3,x, algorithm="fricas")
```

```
[Out] 1/216*(54*(a^3*d^3*f^4*g^4*n^4*x^4 + 4*a^3*c*d^2*f^4*g^4*n^4*x^3
+ 6*a^3*c^2*d*f^4*g^4*n^4*x^2 + 4*a^3*c^3*f^4*g^4*n^4*x)*log(F)^4
 - 8*(2*b^3*d^3 - 9*(b^3*d^3*f^3*g^3*n^3*x^3 + 3*b^3*c*d^2*f^3*g^
3*n^3*x^2 + 3*b^3*c^2*d*f^3*g^3*n^3*x + b^3*c^3*f^3*g^3*n^3)*log(
F)^3 + 9*(b^3*d^3*f^2*g^2*n^2*x^2 + 2*b^3*c*d^2*f^2*g^2*n^2*x + b
^3*c^2*d*f^2*g^2*n^2)*log(F)^2 - 6*(b^3*d^3*f*g*n*x + b^3*c*d^2*f
*g*n)*log(F))*F^(3*f*g*n*x + 3*e*g*n) - 81*(3*a*b^2*d^3 - 4*(a*b^
2*d^3*f^3*g^3*n^3*x^3 + 3*a*b^2*c*d^2*f^3*g^3*n^3*x^2 + 3*a*b^2*c
^2*d*f^3*g^3*n^3*x + a*b^2*c^3*f^3*g^3*n^3)*log(F)^3 + 6*(a*b^2*d
^3*f^2*g^2*n^2*x^2 + 2*a*b^2*c*d^2*f^2*g^2*n^2*x + a*b^2*c^2*d*f^
2*g^2*n^2)*log(F)^2 - 6*(a*b^2*d^3*f*g*n*x + a*b^2*c*d^2*f*g*n)*l
og(F))*F^(2*f*g*n*x + 2*e*g*n) - 648*(6*a^2*b*d^3 - (a^2*b*d^3*f^
```

```
3*g^3*n^3*x^3 + 3*a^2*b*c*d^2*f^3*g^3*n^3*x^2 + 3*a^2*b*c^2*d*f^3
*g^3*n^3*x + a^2*b*c^3*f^3*g^3*n^3)*log(F)^3 + 3*(a^2*b*d^3*f^2*g
^2*n^2*x^2 + 2*a^2*b*c*d^2*f^2*g^2*n^2*x + a^2*b*c^2*d*f^2*g^2*n^
2)*log(F)^2 - 6*(a^2*b*d^3*f*g*n*x + a^2*b*c*d^2*f*g*n)*log(F))*F
^(f*g*n*x + e*g*n))/(f^4*g^4*n^4*log(F)^4)
```

Sympy [A] time = 1.57344, size = 1074, normalized size = 2.17

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(F**(g*(f*x+e)))**n)**3*(d*x+c)**3,x)
```

```
[Out] a**3*c**3*x + 3*a**3*c**2*d*x**2/2 + a**3*c*d**2*x**3 + a**3*d**3
*x**4/4 + Piecewise((((72*b**3*c**3*f**11*g**11*n**11*log(F)**11
+ 216*b**3*c**2*d*f**11*g**11*n**11*x*log(F)**11 - 72*b**3*c**2*d
*f**10*g**10*n**10*log(F)**10 + 216*b**3*c*d**2*f**11*g**11*n**11
*x**2*log(F)**11 - 144*b**3*c*d**2*f**10*g**10*n**10*x*log(F)**10
 + 48*b**3*c*d**2*f**9*g**9*n**9*log(F)**9 + 72*b**3*d**3*f**11*g
**11*n**11*x**3*log(F)**11 - 72*b**3*d**3*f**10*g**10*n**10*x**2*
log(F)**10 + 48*b**3*d**3*f**9*g**9*n**9*x*log(F)**9 - 16*b**3*d*
*3*f**8*g**8*n**8*log(F)**8)*(F**(g*(e + f*x)))**(3*n) + (324*a*b
**2*c**3*f**11*g**11*n**11*log(F)**11 + 972*a*b**2*c**2*d*f**11*g
**11*n**11*x*log(F)**11 - 486*a*b**2*c**2*d*f**10*g**10*n**10*log
(F)**10 + 972*a*b**2*c*d**2*f**11*g**11*n**11*x**2*log(F)**11 - 9
72*a*b**2*c*d**2*f**10*g**10*n**10*x*log(F)**10 + 486*a*b**2*c*d*
*2*f**9*g**9*n**9*log(F)**9 + 324*a*b**2*d**3*f**11*g**11*n**11*x
**3*log(F)**11 - 486*a*b**2*d**3*f**10*g**10*n**10*x**2*log(F)**1
0 + 486*a*b**2*d**3*f**9*g**9*n**9*x*log(F)**9 - 243*a*b**2*d**3*
f**8*g**8*n**8*log(F)**8)*(F**(g*(e + f*x)))**(2*n) + (648*a**2*b
*c**3*f**11*g**11*n**11*log(F)**11 + 1944*a**2*b*c**2*d*f**11*g**
11*n**11*x*log(F)**11 - 1944*a**2*b*c**2*d*f**10*g**10*n**10*log(
F)**10 + 1944*a**2*b*c*d**2*f**11*g**11*n**11*x**2*log(F)**11 - 3
888*a**2*b*c*d**2*f**10*g**10*n**10*x*log(F)**10 + 3888*a**2*b*c*
d**2*f**9*g**9*n**9*log(F)**9 + 648*a**2*b*d**3*f**11*g**11*n**11
*x**3*log(F)**11 - 1944*a**2*b*d**3*f**10*g**10*n**10*x**2*log(F)
**10 + 3888*a**2*b*d**3*f**9*g**9*n**9*x*log(F)**9 - 3888*a**2*b*
d**3*f**8*g**8*n**8*log(F)**8)*(F**(g*(e + f*x)))**n)/(216*f**12*
g**12*n**12*log(F)**12), Ne(216*f**12*g**12*n**12*log(F)**12, 0))
, (x**4*(3*a**2*b*d**3/4 + 3*a*b**2*d**3/4 + b**3*d**3/4) + x**3*
(3*a**2*b*c*d**2 + 3*a*b**2*c*d**2 + b**3*c*d**2) + x**2*(9*a**2*
b*c**2*d/2 + 9*a*b**2*c**2*d/2 + 3*b**3*c**2*d/2) + x*(3*a**2*b*c
**3 + 3*a*b**2*c**3 + b**3*c**3), True))
```

GIAC/XCAS [A] time = 0.568073, size = 1, normalized size = 0.

Done

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^3*(d*x + c)^3,x, algorithm="giac")
```

```
[Out] Done
```

3.40 $\int \left(a+b\left(F^{g(e+fx)}\right)^n\right)^3 (c+dx)^2\,dx$

Optimal. Leaf size=366

$$\frac{a^3(c+dx)^3}{3d}-\frac{6a^2bd(c+dx)\left(F^{eg+fgx}\right)^n}{f^2g^2n^2\log^2(F)}+\frac{3a^2b(c+dx)^2\left(F^{eg+fgx}\right)^n}{fgn\log(F)}+\frac{6a^2bd^2\left(F^{eg+fgx}\right)^n}{f^3g^3n^3\log^3(F)}-\frac{3ab^2d(c+dx)\left(F^{eg+fgx}\right)^{2n}}{2f^2g^2n^2\log^2(F)}+\frac{3ab^2(c+dx)^2\left(F^{eg+fgx}\right)^{2n}}{2fgn\log(F)}+\frac{3ab^2d^2\left(F^{eg+fgx}\right)^{2n}}{4f^3g^3n^3\log^3(F)}-\frac{2b^3d(c+dx)\left(F^{eg+fgx}\right)^{3n}}{9f^2g^2n^2\log^2(F)}+\frac{b^3(c+dx)^2\left(F^{eg+fgx}\right)^{3n}}{3fgn\log(F)}+\frac{2b^3d^2\left(F^{eg+fgx}\right)^{3n}}{27f^3g^3n^3\log^3(F)}$$

```
[Out] (a^3*(c + d*x)^3)/(3*d) + (6*a^2*b*d^2*(F^(e*g + f*g*x))^n)/(f^3*
g^3*n^3*Log[F]^3) + (3*a*b^2*d^2*(F^(e*g + f*g*x))^(2*n))/(4*f^3*
g^3*n^3*Log[F]^3) + (2*b^3*d^2*(F^(e*g + f*g*x))^(3*n))/(27*f^3*g
^3*n^3*Log[F]^3) - (6*a^2*b*d*(F^(e*g + f*g*x))^n*(c + d*x))/(f^2
*g^2*n^2*Log[F]^2) - (3*a*b^2*d*(F^(e*g + f*g*x))^(2*n)*(c + d*x)
)/(2*f^2*g^2*n^2*Log[F]^2) - (2*b^3*d*(F^(e*g + f*g*x))^(3*n)*(c
+ d*x))/(9*f^2*g^2*n^2*Log[F]^2) + (3*a^2*b*(F^(e*g + f*g*x))^n*(
c + d*x)^2)/(f*g*n*Log[F]) + (3*a*b^2*(F^(e*g + f*g*x))^(2*n)*(c
+ d*x)^2)/(2*f*g*n*Log[F]) + (b^3*(F^(e*g + f*g*x))^(3*n)*(c + d*
x)^2)/(3*f*g*n*Log[F])
```

Rubi [A] time = 0.812209, antiderivative size = 366, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.12$

$$\frac{a^3(c+dx)^3}{3d}-\frac{6a^2bd(c+dx)\left(F^{eg+fgx}\right)^n}{f^2g^2n^2\log^2(F)}+\frac{3a^2b(c+dx)^2\left(F^{eg+fgx}\right)^n}{fgn\log(F)}+\frac{6a^2bd^2\left(F^{eg+fgx}\right)^n}{f^3g^3n^3\log^3(F)}-\frac{3ab^2d(c+dx)\left(F^{eg+fgx}\right)^{2n}}{2f^2g^2n^2\log^2(F)}+\frac{3ab^2(c+dx)^2\left(F^{eg+fgx}\right)^{2n}}{2fgn\log(F)}+\frac{3ab^2d^2\left(F^{eg+fgx}\right)^{2n}}{4f^3g^3n^3\log^3(F)}-\frac{2b^3d(c+dx)\left(F^{eg+fgx}\right)^{3n}}{9f^2g^2n^2\log^2(F)}+\frac{b^3(c+dx)^2\left(F^{eg+fgx}\right)^{3n}}{3fgn\log(F)}+\frac{2b^3d^2\left(F^{eg+fgx}\right)^{3n}}{27f^3g^3n^3\log^3(F)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)^3*(c + d*x)^2,x]
```

```
[Out] (a^3*(c + d*x)^3)/(3*d) + (6*a^2*b*d^2*(F^(e*g + f*g*x))^n)/(f^3*
g^3*n^3*Log[F]^3) + (3*a*b^2*d^2*(F^(e*g + f*g*x))^(2*n))/(4*f^3*
g^3*n^3*Log[F]^3) + (2*b^3*d^2*(F^(e*g + f*g*x))^(3*n))/(27*f^3*g
^3*n^3*Log[F]^3) - (6*a^2*b*d*(F^(e*g + f*g*x))^n*(c + d*x))/(f^2
*g^2*n^2*Log[F]^2) - (3*a*b^2*d*(F^(e*g + f*g*x))^(2*n)*(c + d*x)
)/(2*f^2*g^2*n^2*Log[F]^2) - (2*b^3*d*(F^(e*g + f*g*x))^(3*n)*(c
```

```
+ d*x))/(9*f^2*g^2*n^2*Log[F]^2) + (3*a^2*b*(F^(e*g + f*g*x))^n*(
c + d*x)^2)/(f*g*n*Log[F]) + (3*a*b^2*(F^(e*g + f*g*x))^(2*n)*(c
+ d*x)^2)/(2*f*g*n*Log[F]) + (b^3*(F^(e*g + f*g*x))^(3*n)*(c + d*
x)^2)/(3*f*g*n*Log[F])
```

Rubi in Sympy [A] time = 110.148, size = 347, normalized size = 0.95

$$\frac{a^3(c+dx)^3}{3d} + \frac{6a^2bd^2\left(F^{g(e+fx)}\right)^n}{f^3g^3n^3\log(F)^3} - \frac{6a^2bd(c+dx)\left(F^{g(e+fx)}\right)^n}{f^2g^2n^2\log(F)^2} + \frac{3a^2b(c+dx)^2\left(F^{g(e+fx)}\right)^n}{fgn\log(F)} + \frac{3ab^2d^2\left(F^{g(e+fx)}\right)^{2n}}{4f^3g^3n^3\log(F)^3} - \frac{3ab^2d(c+dx)\left(F^{g(e+fx)}\right)^{2n}}{2f^2g^2n^2\log(F)^2} + \frac{3ab^2(c+dx)^2\left(F^{g(e+fx)}\right)^{2n}}{2fgn\log(F)} + \frac{2b^3d^2\left(F^{g(e+fx)}\right)^{3n}}{27f^3g^3n^3\log(F)^3} - \frac{2b^3d(c+dx)\left(F^{g(e+fx)}\right)^{3n}}{9f^2g^2n^2\log(F)^2} + \frac{b^3(c+dx)^2\left(F^{g(e+fx)}\right)^{3n}}{3fgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(F**(g*(f*x+e)))**n)**3*(d*x+c)**2,x)
```

```
[Out] a**3*(c + d*x)**3/(3*d) + 6*a**2*b*d**2*(F**(g*(e + f*x)))**n/(f*
*3*g**3*n**3*log(F)**3) - 6*a**2*b*d*(c + d*x)*(F**(g*(e + f*x)))
**n/(f**2*g**2*n**2*log(F)**2) + 3*a**2*b*(c + d*x)**2*(F**(g*(e
+ f*x)))**n/(f*g*n*log(F)) + 3*a*b**2*d**2*(F**(g*(e + f*x)))**(2
*n)/(4*f**3*g**3*n**3*log(F)**3) - 3*a*b**2*d*(c + d*x)*(F**(g*(e
 + f*x)))**(2*n)/(2*f**2*g**2*n**2*log(F)**2) + 3*a*b**2*(c + d*x
)**2*(F**(g*(e + f*x)))**(2*n)/(2*f*g*n*log(F)) + 2*b**3*d**2*(F*
*(g*(e + f*x)))**(3*n)/(27*f**3*g**3*n**3*log(F)**3) - 2*b**3*d*(
c + d*x)*(F**(g*(e + f*x)))**(3*n)/(9*f**2*g**2*n**2*log(F)**2) +
 b**3*(c + d*x)**2*(F**(g*(e + f*x)))**(3*n)/(3*f*g*n*log(F))
```

Mathematica [A] time = 0.48567, size = 248, normalized size = 0.68

$$a^3c^2x + a^3cdx^2 + \frac{1}{3}a^3d^2x^3 + \frac{3a^2b\left(F^{g(e+fx)}\right)^n\left(f^2g^2n^2\log^2(F)(c+dx)^2 - 2dfgn\log(F)(c+dx) + 2d^2\right)}{f^3g^3n^3\log^3(F)} + \frac{3ab^2\left(F^{g(e+fx)}\right)^{2n}\left(2f^2g^2n^2\log^2(F)(c+dx)^2 - 2dfgn\log(F)(c+dx) + d^2\right)}{4f^3g^3n^3\log^3(F)} + \frac{b^3\left(F^{g(e+fx)}\right)^{3n}\left(9f^2g^2n^2\log^2(F)(c+dx)^2 - 6dfgn\log(F)(c+dx) + 2d^2\right)}{27f^3g^3n^3\log^3(F)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)^3*(c + d*x)^2,x]
```

```
[Out] a^3*c^2*x + a^3*c*d*x^2 + (a^3*d^2*x^3)/3 + (3*a^2*b*(F^(g*(e + f
*x)))^n*(2*d^2 - 2*d*f*g*n*(c + d*x)*Log[F] + f^2*g^2*n^2*(c + d*
x)^2*Log[F]^2))/(f^3*g^3*n^3*Log[F]^3) + (3*a*b^2*(F^(g*(e + f*x)
))^(2*n)*(d^2 - 2*d*f*g*n*(c + d*x)*Log[F] + 2*f^2*g^2*n^2*(c + d
*x)^2*Log[F]^2))/(4*f^3*g^3*n^3*Log[F]^3) + (b^3*(F^(g*(e + f*x))
)^(3*n)*(2*d^2 - 6*d*f*g*n*(c + d*x)*Log[F] + 9*f^2*g^2*n^2*(c +
d*x)^2*Log[F]^2))/(27*f^3*g^3*n^3*Log[F]^3)
```

Maple [F] time = 0.03, size = 0, normalized size = 0.

$$\int \left(a + b\left(F^{g(fx+e)}\right)^{n}\right)^{3} (dx + c)^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(F^(g*(f*x+e)))^n)^3*(d*x+c)^2,x)
```

```
[Out] int((a+b*(F^(g*(f*x+e)))^n)^3*(d*x+c)^2,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^3*(d*x + c)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.288688, size = 559, normalized size = 1.53

$$36\left(a^{3} d^{2} f^{3} g^{3} n^{3} x^{3} + 3\, a^{3} c d f^{3} g^{3} n^{3} x^{2} + 3\, a^{3} c^{2} f^{3} g^{3} n^{3} x\right) \log\left(F\right)^{3} + 4\left(2\, b^{3} d^{2} + 9\left(b^{3} d^{2} f^{2} g^{2} n^{2} x^{2} + 2\, b^{3} c d f^{2} g^{2} n^{2} x + b^{3} c^{2} f^{2} g^{2} n\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^3*(d*x + c)^2,x, algorithm="fricas")
```

```
[Out] 1/108*(36*(a^3*d^2*f^3*g^3*n^3*x^3 + 3*a^3*c*d*f^3*g^3*n^3*x^2 +
3*a^3*c^2*f^3*g^3*n^3*x)*log(F)^3 + 4*(2*b^3*d^2 + 9*(b^3*d^2*f^2
*g^2*n^2*x^2 + 2*b^3*c*d*f^2*g^2*n^2*x + b^3*c^2*f^2*g^2*n^2)*log
(F)^2 - 6*(b^3*d^2*f*g*n*x + b^3*c*d*f*g*n)*log(F))*F^(3*f*g*n*x
+ 3*e*g*n) + 81*(a*b^2*d^2 + 2*(a*b^2*d^2*f^2*g^2*n^2*x^2 + 2*a*b
^2*c*d*f^2*g^2*n^2*x + a*b^2*c^2*f^2*g^2*n^2)*log(F)^2 - 2*(a*b^2
*d^2*f*g*n*x + a*b^2*c*d*f*g*n)*log(F))*F^(2*f*g*n*x + 2*e*g*n) +
 324*(2*a^2*b*d^2 + (a^2*b*d^2*f^2*g^2*n^2*x^2 + 2*a^2*b*c*d*f^2*
g^2*n^2*x + a^2*b*c^2*f^2*g^2*n^2)*log(F)^2 - 2*(a^2*b*d^2*f*g*n*
x + a^2*b*c*d*f*g*n)*log(F))*F^(f*g*n*x + e*g*n))/(f^3*g^3*n^3*lo
g(F)^3)
```

Sympy [A] time = 1.20238, size = 653, normalized size = 1.78

$$a^3c^2x + a^3cdx^2 + \frac{a^3d^2x^3}{3} + \begin{cases} \frac{\left(36b^3c^2f^8g^8n^8\log{(F)}^8+72b^3cdf^8g^8n^8x\log{(F)}^8-24b^3cdf^7g^7n^7\log{(F)}^7+36b^3d^2f^8g^8n^8x^2\log{(F)}^8-24b^3d^2f^7g^7n^7x\log{(F)}^7+8b^3d^2f^6g^6n^6\log{(F)}^6\right)\left(F^{g(e\cdots}\right.}{\cdots} \\ x^3\left(a^2bd^2 + ab^2d^2 + \frac{b^3d^2}{3}\right) + x^2\left(3a^2bcd + 3ab^2cd + b^3cd\right) + x\left(3a^2bc^2 + 3ab^2c^2 + b^3c^2\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(F**(g*(f*x+e)))**n)**3*(d*x+c)**2,x)
```

```
[Out] a**3*c**2*x + a**3*c*d*x**2 + a**3*d**2*x**3/3 + Piecewise((((36*
b**3*c**2*f**8*g**8*n**8*log(F)**8 + 72*b**3*c*d*f**8*g**8*n**8*x
*log(F)**8 - 24*b**3*c*d*f**7*g**7*n**7*log(F)**7 + 36*b**3*d**2*
f**8*g**8*n**8*x**2*log(F)**8 - 24*b**3*d**2*f**7*g**7*n**7*x*log
(F)**7 + 8*b**3*d**2*f**6*g**6*n**6*log(F)**6)*(F**(g*(e + f*x)))
**(3*n) + (162*a*b**2*c**2*f**8*g**8*n**8*log(F)**8 + 324*a*b**2*
c*d*f**8*g**8*n**8*x*log(F)**8 - 162*a*b**2*c*d*f**7*g**7*n**7*lo
g(F)**7 + 162*a*b**2*d**2*f**8*g**8*n**8*x**2*log(F)**8 - 162*a*b
**2*d**2*f**7*g**7*n**7*x*log(F)**7 + 81*a*b**2*d**2*f**6*g**6*n*
*6*log(F)**6)*(F**(g*(e + f*x)))**(2*n) + (324*a**2*b*c**2*f**8*g
**8*n**8*log(F)**8 + 648*a**2*b*c*d*f**8*g**8*n**8*x*log(F)**8 -
648*a**2*b*c*d*f**7*g**7*n**7*log(F)**7 + 324*a**2*b*d**2*f**8*g*
*8*n**8*x**2*log(F)**8 - 648*a**2*b*d**2*f**7*g**7*n**7*x*log(F)*
*7 + 648*a**2*b*d**2*f**6*g**6*n**6*log(F)**6)*(F**(g*(e + f*x)))
**n)/(108*f**9*g**9*n**9*log(F)**9), Ne(108*f**9*g**9*n**9*log(F)
**9, 0)), (x**3*(a**2*b*d**2 + a*b**2*d**2 + b**3*d**2/3) + x**2*
(3*a**2*b*c*d + 3*a*b**2*c*d + b**3*c*d) + x*(3*a**2*b*c**2 + 3*a
*b**2*c**2 + b**3*c**2), True))
```

GIAC/XCAS [A] time = 0.494753, size = 1, normalized size = 0.

Done

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)^3*(d*x + c)^2,x, algorithm="giac")
```

```
[Out] Done
```

3.41 $\int \left(a+b\left(F^{g(e+fx)}\right)^n\right)^3 (c+dx)\,dx$

Optimal. Leaf size=236

$$\frac{a^3(c+dx)^2}{2d}+\frac{3a^2b(c+dx)\left(F^{eg+fgx}\right)^n}{fgn\log(F)}-\frac{3a^2bd\left(F^{eg+fgx}\right)^n}{f^2g^2n^2\log^2(F)}+\frac{3ab^2(c+dx)\left(F^{eg+fgx}\right)^{2n}}{2fgn\log(F)}-\frac{3ab^2d\left(F^{eg+fgx}\right)^{2n}}{4f^2g^2n^2\log^2(F)}+\frac{b^3(c+dx)\left(F^{eg+fgx}\right)^{3n}}{3fgn\log(F)}-\frac{b^3d\left(F^{eg+fgx}\right)^{3n}}{9f^2g^2n^2\log^2(F)}$$

```
[Out] (a^3*(c + d*x)^2)/(2*d) - (3*a^2*b*d*(F^(e*g + f*g*x))^n)/(f^2*g^
2*n^2*Log[F]^2) - (3*a*b^2*d*(F^(e*g + f*g*x))^(2*n))/(4*f^2*g^2*
n^2*Log[F]^2) - (b^3*d*(F^(e*g + f*g*x))^(3*n))/(9*f^2*g^2*n^2*Lo
g[F]^2) + (3*a^2*b*(F^(e*g + f*g*x))^n*(c + d*x))/(f*g*n*Log[F])
+ (3*a*b^2*(F^(e*g + f*g*x))^(2*n)*(c + d*x))/(2*f*g*n*Log[F]) +
(b^3*(F^(e*g + f*g*x))^(3*n)*(c + d*x))/(3*f*g*n*Log[F])
```

Rubi [A] time = 0.407849, antiderivative size = 236, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.13$

$$\frac{a^3(c+dx)^2}{2d}+\frac{3a^2b(c+dx)\left(F^{eg+fgx}\right)^n}{fgn\log(F)}-\frac{3a^2bd\left(F^{eg+fgx}\right)^n}{f^2g^2n^2\log^2(F)}+\frac{3ab^2(c+dx)\left(F^{eg+fgx}\right)^{2n}}{2fgn\log(F)}-\frac{3ab^2d\left(F^{eg+fgx}\right)^{2n}}{4f^2g^2n^2\log^2(F)}+\frac{b^3(c+dx)\left(F^{eg+fgx}\right)^{3n}}{3fgn\log(F)}-\frac{b^3d\left(F^{eg+fgx}\right)^{3n}}{9f^2g^2n^2\log^2(F)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)^3*(c + d*x),x]
```

```
[Out] (a^3*(c + d*x)^2)/(2*d) - (3*a^2*b*d*(F^(e*g + f*g*x))^n)/(f^2*g^
2*n^2*Log[F]^2) - (3*a*b^2*d*(F^(e*g + f*g*x))^(2*n))/(4*f^2*g^2*
n^2*Log[F]^2) - (b^3*d*(F^(e*g + f*g*x))^(3*n))/(9*f^2*g^2*n^2*Lo
g[F]^2) + (3*a^2*b*(F^(e*g + f*g*x))^n*(c + d*x))/(f*g*n*Log[F])
+ (3*a*b^2*(F^(e*g + f*g*x))^(2*n)*(c + d*x))/(2*f*g*n*Log[F]) +
(b^3*(F^(e*g + f*g*x))^(3*n)*(c + d*x))/(3*f*g*n*Log[F])
```

Rubi in Sympy [A] time = 56.5991, size = 212, normalized size = 0.9

$$\frac{a^3(c+dx)^2}{2d}-\frac{3a^2bd\left(F^{g(e+fx)}\right)^n}{f^2g^2n^2\log(F)^2}+\frac{3a^2b(c+dx)\left(F^{g(e+fx)}\right)^n}{fgn\log(F)}-\frac{3ab^2d\left(F^{g(e+fx)}\right)^{2n}}{4f^2g^2n^2\log(F)^2}+\frac{3ab^2(c+dx)\left(F^{g(e+fx)}\right)^{2n}}{2fgn\log(F)}-\frac{b^3d\left(F^{g(e+fx)}\right)^{3n}}{9f^2g^2n^2\log(F)^2}+\frac{b^3(c+dx)\left(F^{g(e+fx)}\right)^{3n}}{3fgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(F**(g*(f*x+e)))**n)**3*(d*x+c),x)
```

```
[Out] a**3*(c + d*x)**2/(2*d) - 3*a**2*b*d*(F**(g*(e + f*x)))**n/(f**2*
g**2*n**2*log(F)**2) + 3*a**2*b*(c + d*x)*(F**(g*(e + f*x)))**n/(
f*g*n*log(F)) - 3*a*b**2*d*(F**(g*(e + f*x)))**(2*n)/(4*f**2*g**2
*n**2*log(F)**2) + 3*a*b**2*(c + d*x)*(F**(g*(e + f*x)))**(2*n)/(
2*f*g*n*log(F)) - b**3*d*(F**(g*(e + f*x)))**(3*n)/(9*f**2*g**2*n
**2*log(F)**2) + b**3*(c + d*x)*(F**(g*(e + f*x)))**(3*n)/(3*f*g*
n*log(F))
```

Mathematica [A] time = 0.382393, size = 161, normalized size = 0.68

$$\frac{18a^3f^2g^2n^2x\log^2(F)(2c+dx)+6bfgn\log(F)(c+dx)\left(F^{g(e+fx)}\right)^n\left(18a^2+9ab\left(F^{g(e+fx)}\right)^n+2b^2\left(F^{g(e+fx)}\right)^{2n}\right)-bd\left(F^{g(e+f}\right.}{36f^2g^2n^2\log^2(F)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)^3*(c + d*x),x]
```

```
[Out] (-(b*d*(F^(g*(e + f*x)))^n*(108*a^2 + 27*a*b*(F^(g*(e + f*x)))^n
+ 4*b^2*(F^(g*(e + f*x)))^(2*n))) + 6*b*f*(F^(g*(e + f*x)))^n*(18
*a^2 + 9*a*b*(F^(g*(e + f*x)))^n + 2*b^2*(F^(g*(e + f*x)))^(2*n))
*g*n*(c + d*x)*Log[F] + 18*a^3*f^2*g^2*n^2*x*(2*c + d*x)*Log[F]^2
)/(36*f^2*g^2*n^2*Log[F]^2)
```

Maple [F] time = 0.018, size = 0, normalized size = 0.

$$\int\left(a+b\left(F^{g(fx+e)}\right)^n\right)^3(dx+c)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(F^(g*(f*x+e)))^n)^3*(d*x+c),x)
```

```
[Out] int((a+b*(F^(g*(f*x+e)))^n)^3*(d*x+c),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^3*(d*x + c),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.271223, size = 259, normalized size = 1.1

$$\frac{18\left(a^3df^2g^2n^2x^2+2\,a^3cf^2g^2n^2x\right)\log\left(F\right)^2-4\left(b^3d-3\left(b^3dfgnx+b^3cfgn\right)\log\left(F\right)\right)F^{3\,fgnx+3\,egn}-27\left(ab^2d-2\left(ab^2dfgn\right.\right.}{36\,f^2g^2n^2\log\left(F\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^3*(d*x + c),x, algorithm="fricas")
```

```
[Out] 1/36*(18*(a^3*d*f^2*g^2*n^2*x^2 + 2*a^3*c*f^2*g^2*n^2*x)*log(F)^2
 - 4*(b^3*d - 3*(b^3*d*f*g*n*x + b^3*c*f*g*n)*log(F))*F^(3*f*g*n*
x + 3*e*g*n) - 27*(a*b^2*d - 2*(a*b^2*d*f*g*n*x + a*b^2*c*f*g*n)*
log(F))*F^(2*f*g*n*x + 2*e*g*n) - 108*(a^2*b*d - (a^2*b*d*f*g*n*x
 + a^2*b*c*f*g*n)*log(F))*F^(f*g*n*x + e*g*n))/(f^2*g^2*n^2*log(F
)^2)
```

Sympy [A] time = 0.886819, size = 350, normalized size = 1.48

$$a^3cx+\frac{a^3dx^2}{2}+\begin{cases}\frac{\left(12b^3cf^5g^5n^5\log\left(F\right)^5+12b^3df^5g^5n^5x\log\left(F\right)^5-4b^3df^4g^4n^4\log\left(F\right)^4\right)\left(F^{g(e+fx)}\right)^{3n}+\left(54ab^2cf^5g^5n^5\log\left(F\right)^5+54ab^2df^5g^5n^5x\log\left(F\right)^5-27ab^2df^4g^4n^4\log\left(\right.\right.}{36f^6g^6n^6\log\left(F\right)^6} \\ x^2\left(\frac{3a^2bd}{2}+\frac{3ab^2d}{2}+\frac{b^3d}{2}\right)+x\left(3a^2bc+3ab^2c+b^3c\right)\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(F**(g*(f*x+e)))**n)**3*(d*x+c),x)
```

```
[Out] a**3*c*x + a**3*d*x**2/2 + Piecewise((((12*b**3*c*f**5*g**5*n**5*
log(F)**5 + 12*b**3*d*f**5*g**5*n**5*x*log(F)**5 - 4*b**3*d*f**4*
g**4*n**4*log(F)**4)*(F**(g*(e + f*x)))**(3*n) + (54*a*b**2*c*f**
5*g**5*n**5*log(F)**5 + 54*a*b**2*d*f**5*g**5*n**5*x*log(F)**5 -
27*a*b**2*d*f**4*g**4*n**4*log(F)**4)*(F**(g*(e + f*x)))**(2*n) +
 (108*a**2*b*c*f**5*g**5*n**5*log(F)**5 + 108*a**2*b*d*f**5*g**5*
n**5*x*log(F)**5 - 108*a**2*b*d*f**4*g**4*n**4*log(F)**4)*(F**(g*
(e + f*x)))**n)/(36*f**6*g**6*n**6*log(F)**6), Ne(36*f**6*g**6*n*
*6*log(F)**6, 0)), (x**2*(3*a**2*b*d/2 + 3*a*b**2*d/2 + b**3*d/2)
 + x*(3*a**2*b*c + 3*a*b**2*c + b**3*c), True))
```

GIAC/XCAS [A] time = 0.449691, size = 1, normalized size = 0.

$$\textit{Done}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)^3*(d*x + c),x, algorithm="giac")
```

```
[Out] Done
```

3.42 $\int \left(a+b \left(F^{g(e+fx)}\right)^n\right)^3 \, dx$

Optimal. Leaf size=103

$$a^3x+\frac{3a^2b\left(F^{g(e+fx)}\right)^n}{fgn\log(F)}+\frac{3ab^2\left(F^{g(e+fx)}\right)^{2n}}{2fgn\log(F)}+\frac{b^3\left(F^{g(e+fx)}\right)^{3n}}{3fgn\log(F)}$$

```
[Out] a^3*x + (3*a^2*b*(F^(g*(e + f*x)))^n)/(f*g*n*Log[F]) + (3*a*b^2*(
F^(g*(e + f*x)))^(2*n))/(2*f*g*n*Log[F]) + (b^3*(F^(g*(e + f*x)))
^(3*n))/(3*f*g*n*Log[F])
```

Rubi [A] time = 0.112289, antiderivative size = 103, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176

$$a^3x+\frac{3a^2b\left(F^{g(e+fx)}\right)^n}{fgn\log(F)}+\frac{3ab^2\left(F^{g(e+fx)}\right)^{2n}}{2fgn\log(F)}+\frac{b^3\left(F^{g(e+fx)}\right)^{3n}}{3fgn\log(F)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)^3,x]
```

```
[Out] a^3*x + (3*a^2*b*(F^(g*(e + f*x)))^n)/(f*g*n*Log[F]) + (3*a*b^2*(
F^(g*(e + f*x)))^(2*n))/(2*f*g*n*Log[F]) + (b^3*(F^(g*(e + f*x)))
^(3*n))/(3*f*g*n*Log[F])
```

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

$$\frac{a^3\log\left(\left(F^{g(e+fx)}\right)^n\right)}{fgn\log(F)}+\frac{3a^2b\left(F^{g(e+fx)}\right)^n}{fgn\log(F)}+\frac{3ab^2\int^{\left(F^{g(e+fx)}\right)^n}x\,dx}{fgn\log(F)}+\frac{b^3\left(F^{g(e+fx)}\right)^{3n}}{3fgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(F**(g*(f*x+e)))**n)**3,x)
```

```
[Out] a**3*log((F**(g*(e + f*x)))**n)/(f*g*n*log(F)) + 3*a**2*b*(F**(g*
(e + f*x)))**n/(f*g*n*log(F)) + 3*a*b**2*Integral(x, (x, (F**(g*(
e + f*x)))**n))/(f*g*n*log(F)) + b**3*(F**(g*(e + f*x)))**(3*n)/(
3*f*g*n*log(F))
```

Mathematica [A] time = 0.136143, size = 74, normalized size = 0.72

$$a^3x+\frac{b\left(F^{g(e+fx)}\right)^n\left(18a^2+9ab\left(F^{g(e+fx)}\right)^n+2b^2\left(F^{g(e+fx)}\right)^{2n}\right)}{6fgn\log(F)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)^3,x]
```

```
[Out] a^3*x + (b*(F^(g*(e + f*x)))^n*(18*a^2 + 9*a*b*(F^(g*(e + f*x)))^
n + 2*b^2*(F^(g*(e + f*x)))^(2*n)))/(6*f*g*n*Log[F])
```

Maple [A] time = 0.005, size = 124, normalized size = 1.2

$$\frac{b^3\left(\left(F^{g(fx+e)}\right)^n\right)^3}{3\,ngf\ln(F)}+\frac{3\,ab^2\left(\left(F^{g(fx+e)}\right)^n\right)^2}{2\,ngf\ln(F)}+3\,\frac{a^2b\left(F^{g(fx+e)}\right)^n}{ngf\ln(F)}+\frac{a^3\ln\left(\left(F^{g(fx+e)}\right)^n\right)}{ngf\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(F^(g*(f*x+e)))^n)^3,x)
```

```
[Out] 1/3/g/f/ln(F)/n*b^3*((F^(g*(f*x+e)))^n)^3+3/2/g/f/ln(F)/n*a*b^2*(
(F^(g*(f*x+e)))^n)^2+3*a^2*b*(F^(g*(f*x+e)))^n/f/g/n/ln(F)+1/g/f/
ln(F)/n*a^3*ln((F^(g*(f*x+e)))^n)
```

Maxima [A] time = 0.817554, size = 155, normalized size = 1.5

$$a^3x+\frac{3\left(F^{fgx}\right)^n(F^{eg})^na^2b}{fgn\log(F)}+\frac{3\left(F^{fgx}\right)^{2\,n}(F^{eg})^{2\,n}ab^2}{2\,fgn\log(F)}+\frac{\left(F^{fgx}\right)^{3\,n}(F^{eg})^{3\,n}b^3}{3\,fgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)^3,x, algorithm="maxima")
```

```
[Out] a^3*x + 3*(F^(f*g*x))^n*(F^(e*g))^n*a^2*b/(f*g*n*log(F)) + 3/2*(F
^(f*g*x))^(2*n)*(F^(e*g))^(2*n)*a*b^2/(f*g*n*log(F)) + 1/3*(F^(f*
g*x))^(3*n)*(F^(e*g))^(3*n)*b^3/(f*g*n*log(F))
```

Fricas [A] time = 0.298676, size = 113, normalized size = 1.1

$$\frac{6\,a^{3}fgnx\log\left(F\right)+18\,F^{fgnx+egn}a^{2}b+9\,F^{2\,fgnx+2\,egn}ab^{2}+2\,F^{3\,fgnx+3\,egn}b^{3}}{6\,fgn\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)^3,x, algorithm="fricas")
```

```
[Out] 1/6*(6*a^3*f*g*n*x*log(F) + 18*F^(f*g*n*x + e*g*n)*a^2*b + 9*F^(2
*f*g*n*x + 2*e*g*n)*a*b^2 + 2*F^(3*f*g*n*x + 3*e*g*n)*b^3)/(f*g*n
*log(F))
```

Sympy [A] time = 0.487415, size = 153, normalized size = 1.49

$$a^{3}x+\begin{cases}\frac{18a^{2}bf^{2}g^{2}n^{2}\left(F^{g(e+fx)}\right)^{n}\log\left(F\right)^{2}+9ab^{2}f^{2}g^{2}n^{2}\left(F^{g(e+fx)}\right)^{2n}\log\left(F\right)^{2}+2b^{3}f^{2}g^{2}n^{2}\left(F^{g(e+fx)}\right)^{3n}\log\left(F\right)^{2}}{6f^{3}g^{3}n^{3}\log\left(F\right)^{3}} & \text{for } 6f^{3}g^{3}n^{3}\log\left(F\right)^{3}\neq 0\\ x\left(3a^{2}b+3ab^{2}+b^{3}\right) & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(F**(g*(f*x+e)))**n)**3,x)
```

```
[Out] a**3*x + Piecewise(((18*a**2*b*f**2*g**2*n**2*(F**(g*(e + f*x)))*
*n*log(F)**2 + 9*a*b**2*f**2*g**2*n**2*(F**(g*(e + f*x)))**(2*n)*
log(F)**2 + 2*b**3*f**2*g**2*n**2*(F**(g*(e + f*x)))**(3*n)*log(F
)**2)/(6*f**3*g**3*n**3*log(F)**3), Ne(6*f**3*g**3*n**3*log(F)**3
, 0)), (x*(3*a**2*b + 3*a*b**2 + b**3), True))
```

GIAC/XCAS [A] time = 0.304981, size = 1393, normalized size = 13.52

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)^3,x, algorithm="giac")
```

```
[Out] a^3*x + 2/3*(2*b^3*f*g*n*cos(-3/2*pi*f*g*n*x*sign(F) + 3/2*pi*f*g
*n*x - 3/2*pi*g*n*e*sign(F) + 3/2*pi*g*n*e)*ln(abs(F))/(4*f^2*g^2
```

```
*n^2*ln(abs(F))^2 + (pi*f*g*n*sign(F) - pi*f*g*n)^2) - (pi*f*g*n*
sign(F) - pi*f*g*n)*b^3*sin(-3/2*pi*f*g*n*x*sign(F) + 3/2*pi*f*g*
n*x - 3/2*pi*g*n*e*sign(F) + 3/2*pi*g*n*e)/(4*f^2*g^2*n^2*ln(abs(
F))^2 + (pi*f*g*n*sign(F) - pi*f*g*n)^2))*e^(3*f*g*n*x*ln(abs(F))
 + 3*g*n*e*ln(abs(F))) - 1/2*I*(-2*I*b^3*e^(3/2*I*pi*f*g*n*x*sign
(F) - 3/2*I*pi*f*g*n*x + 3/2*I*pi*g*n*e*sign(F) - 3/2*I*pi*g*n*e)
/(3*I*pi*f*g*n*sign(F) - 3*I*pi*f*g*n + 6*f*g*n*ln(abs(F))) + 2*I
*b^3*e^(-3/2*I*pi*f*g*n*x*sign(F) + 3/2*I*pi*f*g*n*x - 3/2*I*pi*g
*n*e*sign(F) + 3/2*I*pi*g*n*e)/(-3*I*pi*f*g*n*sign(F) + 3*I*pi*f*
g*n + 6*f*g*n*ln(abs(F))))*e^(3*f*g*n*x*ln(abs(F)) + 3*g*n*e*ln(a
bs(F))) + 3*(2*a*b^2*f*g*n*cos(-pi*f*g*n*x*sign(F) + pi*f*g*n*x -
 pi*g*n*e*sign(F) + pi*g*n*e)*ln(abs(F))/(4*f^2*g^2*n^2*ln(abs(F)
)^2 + (pi*f*g*n*sign(F) - pi*f*g*n)^2) - (pi*f*g*n*sign(F) - pi*f
*g*n)*a*b^2*sin(-pi*f*g*n*x*sign(F) + pi*f*g*n*x - pi*g*n*e*sign(
F) + pi*g*n*e)/(4*f^2*g^2*n^2*ln(abs(F))^2 + (pi*f*g*n*sign(F) -
pi*f*g*n)^2))*e^(2*f*g*n*x*ln(abs(F)) + 2*g*n*e*ln(abs(F))) - 1/2
*I*(-3*I*a*b^2*e^(I*pi*f*g*n*x*sign(F) - I*pi*f*g*n*x + I*pi*g*n*
e*sign(F) - I*pi*g*n*e)/(I*pi*f*g*n*sign(F) - I*pi*f*g*n + 2*f*g*
n*ln(abs(F))) + 3*I*a*b^2*e^(-I*pi*f*g*n*x*sign(F) + I*pi*f*g*n*x
 - I*pi*g*n*e*sign(F) + I*pi*g*n*e)/(-I*pi*f*g*n*sign(F) + I*pi*f
*g*n + 2*f*g*n*ln(abs(F))))*e^(2*f*g*n*x*ln(abs(F)) + 2*g*n*e*ln(
abs(F))) + 6*(2*a^2*b*f*g*n*cos(-1/2*pi*f*g*n*x*sign(F) + 1/2*pi*
f*g*n*x - 1/2*pi*g*n*e*sign(F) + 1/2*pi*g*n*e)*ln(abs(F))/(4*f^2*
g^2*n^2*ln(abs(F))^2 + (pi*f*g*n*sign(F) - pi*f*g*n)^2) - (pi*f*g
*n*sign(F) - pi*f*g*n)*a^2*b*sin(-1/2*pi*f*g*n*x*sign(F) + 1/2*pi
*f*g*n*x - 1/2*pi*g*n*e*sign(F) + 1/2*pi*g*n*e)/(4*f^2*g^2*n^2*ln
(abs(F))^2 + (pi*f*g*n*sign(F) - pi*f*g*n)^2))*e^(f*g*n*x*ln(abs(
F)) + g*n*e*ln(abs(F))) - 1/2*I*(-6*I*a^2*b*e^(1/2*I*pi*f*g*n*x*s
ign(F) - 1/2*I*pi*f*g*n*x + 1/2*I*pi*g*n*e*sign(F) - 1/2*I*pi*g*n
*e)/(I*pi*f*g*n*sign(F) - I*pi*f*g*n + 2*f*g*n*ln(abs(F))) + 6*I*
a^2*b*e^(-1/2*I*pi*f*g*n*x*sign(F) + 1/2*I*pi*f*g*n*x - 1/2*I*pi*
g*n*e*sign(F) + 1/2*I*pi*g*n*e)/(-I*pi*f*g*n*sign(F) + I*pi*f*g*n
 + 2*f*g*n*ln(abs(F))))*e^(f*g*n*x*ln(abs(F)) + g*n*e*ln(abs(F)))
```

3.43 $\int \frac{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^3}{c+dx}\,dx$

Optimal. Leaf size=200

$$\frac{a^3\log(c+dx)}{d}+\frac{3a^2b\left(F^{eg+fgx}\right)^n F^{gn\left(e-\frac{cf}{d}\right)-gn(e+fx)}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right)}{d}+\frac{3ab^2\left(F^{eg+fgx}\right)^{2n} F^{2gn\left(e-\frac{cf}{d}\right)-2gn(e+fx)}\text{ExpIntegralEi}\left(\frac{2fgn\log(F)(c+dx)}{d}\right)}{d}+\frac{b^3\left(F^{eg+fgx}\right)^{3n} F^{3gn\left(e-\frac{cf}{d}\right)-3gn(e+fx)}\text{ExpIntegralEi}\left(\frac{3fgn\log(F)(c+dx)}{d}\right)}{d}$$

```
[Out] (3*a^2*b*F^((e - (c*f)/d)*g*n - g*n*(e + f*x))*(F^(e*g + f*g*x))^
n*ExpIntegralEi[(f*g*n*(c + d*x)*Log[F])/d])/d + (3*a*b^2*F^(2*(e
 - (c*f)/d)*g*n - 2*g*n*(e + f*x))*(F^(e*g + f*g*x))^(2*n)*ExpInt
egralEi[(2*f*g*n*(c + d*x)*Log[F])/d])/d + (b^3*F^(3*(e - (c*f)/d
)*g*n - 3*g*n*(e + f*x))*(F^(e*g + f*g*x))^(3*n)*ExpIntegralEi[(3
*f*g*n*(c + d*x)*Log[F])/d])/d + (a^3*Log[c + d*x])/d
```

Rubi [A] time = 0.591831, antiderivative size = 200, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.12

$$\frac{a^3\log(c+dx)}{d}+\frac{3a^2b\left(F^{eg+fgx}\right)^n F^{gn\left(e-\frac{cf}{d}\right)-gn(e+fx)}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right)}{d}+\frac{3ab^2\left(F^{eg+fgx}\right)^{2n} F^{2gn\left(e-\frac{cf}{d}\right)-2gn(e+fx)}\text{ExpIntegralEi}\left(\frac{2fgn\log(F)(c+dx)}{d}\right)}{d}+\frac{b^3\left(F^{eg+fgx}\right)^{3n} F^{3gn\left(e-\frac{cf}{d}\right)-3gn(e+fx)}\text{ExpIntegralEi}\left(\frac{3fgn\log(F)(c+dx)}{d}\right)}{d}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)^3/(c + d*x),x]
```


```
[Out] (3*a^2*b*F^((e - (c*f)/d)*g*n - g*n*(e + f*x))*(F^(e*g + f*g*x))^
n*ExpIntegralEi[(f*g*n*(c + d*x)*Log[F])/d])/d + (3*a*b^2*F^(2*(e
 - (c*f)/d)*g*n - 2*g*n*(e + f*x))*(F^(e*g + f*g*x))^(2*n)*ExpInt
egralEi[(2*f*g*n*(c + d*x)*Log[F])/d])/d + (b^3*F^(3*(e - (c*f)/d
)*g*n - 3*g*n*(e + f*x))*(F^(e*g + f*g*x))^(3*n)*ExpIntegralEi[(3
*f*g*n*(c + d*x)*Log[F])/d])/d + (a^3*Log[c + d*x])/d
```

Rubi in Sympy [A] time = 50.4856, size = 211, normalized size = 1.05

$$\frac{F^{gn(-3e-3fx)}F^{-\frac{3gn(cf-de)}{d}}b^3\left(F^{g(e+fx)}\right)^{3n}\operatorname{Ei}\left(\frac{fgn(3c+3dx)\log(F)}{d}\right)}{d} + \frac{3F^{gn(-2e-2fx)}F^{-\frac{2gn(cf-de)}{d}}ab^2\left(F^{g(e+fx)}\right)^{2n}\operatorname{Ei}\left(\frac{fgn(2c+2dx)\log(F)}{d}\right)}{d} + \frac{3F^{gn(-e-fx)}F^{-\frac{gn(cf-de)}{d}}a^2b\left(F^{g(e+fx)}\right)^{n}\operatorname{Ei}\left(\frac{fgn(c+dx)\log(F)}{d}\right)}{d} + \frac{a^3\log(c+dx)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(F**(g*(f*x+e)))**n)**3/(d*x+c),x)
```

```
[Out] F**(g*n*(-3*e - 3*f*x))*F**(-3*g*n*(c*f - d*e)/d)*b**3*(F**(g*(e
+ f*x)))**(3*n)*Ei(f*g*n*(3*c + 3*d*x)*log(F)/d)/d + 3*F**(g*n*(-
2*e - 2*f*x))*F**(-2*g*n*(c*f - d*e)/d)*a*b**2*(F**(g*(e + f*x)))
**(2*n)*Ei(f*g*n*(2*c + 2*d*x)*log(F)/d)/d + 3*F**(g*n*(-e - f*x)
)*F**(-g*n*(c*f - d*e)/d)*a**2*b*(F**(g*(e + f*x)))**n*Ei(f*g*n*(
c + d*x)*log(F)/d)/d + a**3*log(c + d*x)/d
```

Mathematica [A] time = 0.48527, size = 160, normalized size = 0.8

$$\frac{a^3\log(c+dx) + 3a^2b\left(F^{g(e+fx)}\right)^{n}F^{-\frac{fgn(c+dx)}{d}}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right) + 3ab^2\left(F^{g(e+fx)}\right)^{2n}F^{-\frac{2fgn(c+dx)}{d}}\text{ExpIntegralEi}\left(\right.}{d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)^3/(c + d*x),x]
```

```
[Out] ((3*a^2*b*(F^(g*(e + f*x)))^n*ExpIntegralEi[(f*g*n*(c + d*x)*Log[
F])/d])/F^((f*g*n*(c + d*x))/d) + (3*a*b^2*(F^(g*(e + f*x)))^(2*n
)*ExpIntegralEi[(2*f*g*n*(c + d*x)*Log[F])/d])/F^((2*f*g*n*(c + d
*x))/d) + (b^3*(F^(g*(e + f*x)))^(3*n)*ExpIntegralEi[(3*f*g*n*(c
+ d*x)*Log[F])/d])/F^((3*f*g*n*(c + d*x))/d) + a^3*Log[c + d*x])/
d
```

Maple [F] time = 0.034, size = 0, normalized size = 0.

$$\int \frac{\left(a + b\left(F^{g(fx+e)}\right)^{n}\right)^{3}}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(F^(g*(f*x+e)))^n)^3/(d*x+c),x)
```

```
[Out] int((a+b*(F^(g*(f*x+e)))^n)^3/(d*x+c),x)
```

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

$$(F^{eg})^{3n}b^3\int\frac{\left(F^{fgx}\right)^{3n}}{dx+c}\,dx+3\,(F^{eg})^{2n}ab^2\int\frac{\left(F^{fgx}\right)^{2n}}{dx+c}\,dx+3\,(F^{eg})^{n}a^2b\int\frac{\left(F^{fgx}\right)^{n}}{dx+c}\,dx+\frac{a^3\log(dx+c)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^3/(d*x + c),x, algorithm="maxima")
```

```
[Out] (F^(e*g))^(3*n)*b^3*integrate((F^(f*g*x))^(3*n)/(d*x + c), x) + 3
*(F^(e*g))^(2*n)*a*b^2*integrate((F^(f*g*x))^(2*n)/(d*x + c), x)
+ 3*(F^(e*g))^n*a^2*b*integrate((F^(f*g*x))^n/(d*x + c), x) + a^3
*log(d*x + c)/d
```

Fricas [A] time = 0.26588, size = 189, normalized size = 0.94

$$\frac{F^{\frac{3(de-cf)gn}{d}}b^3\mathrm{Ei}\left(\frac{3\,(dfgnx+cfgn)\log(F)}{d}\right)+3\,F^{\frac{2(de-cf)gn}{d}}ab^2\mathrm{Ei}\left(\frac{2\,(dfgnx+cfgn)\log(F)}{d}\right)+3\,F^{\frac{(de-cf)gn}{d}}a^2b\mathrm{Ei}\left(\frac{(dfgnx+cfgn)\log(F)}{d}\right)+a^3}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^3/(d*x + c),x, algorithm="fricas")
```

```
[Out] (F^(3*(d*e - c*f)*g*n/d)*b^3*Ei(3*(d*f*g*n*x + c*f*g*n)*log(F)/d)
 + 3*F^(2*(d*e - c*f)*g*n/d)*a*b^2*Ei(2*(d*f*g*n*x + c*f*g*n)*log
(F)/d) + 3*F^((d*e - c*f)*g*n/d)*a^2*b*Ei((d*f*g*n*x + c*f*g*n)*l
og(F)/d) + a^3*log(d*x + c))/d
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(F**(g*(f*x+e)))**n)**3/(d*x+c),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(\left(F^{(fx+e)g}\right)^{n} b + a\right)^{3}}{dx + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)^3/(d*x + c),x, algorithm="giac")
```

```
[Out] integrate(((F^((f*x + e)*g))^n*b + a)^3/(d*x + c), x)
```

3.44 $\int \frac{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^3}{(c+dx)^2}\,dx$

Optimal. Leaf size=305

$$-\frac{a^3}{d(c+dx)}+\frac{3a^2bfgn\log(F)\left(F^{eg+fgx}\right)^n F^{gn\left(e-\frac{cf}{d}\right)-gn(e+fx)}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right)}{d^2}$$
$$-\frac{3a^2b\left(F^{eg+fgx}\right)^n}{d(c+dx)}$$
$$+\frac{6ab^2fgn\log(F)\left(F^{eg+fgx}\right)^{2n}F^{2gn\left(e-\frac{cf}{d}\right)-2gn(e+fx)}\text{ExpIntegralEi}\left(\frac{2fgn\log(F)(c+dx)}{d}\right)}{d^2}$$
$$-\frac{3ab^2\left(F^{eg+fgx}\right)^{2n}}{d(c+dx)}$$
$$+\frac{3b^3fgn\log(F)\left(F^{eg+fgx}\right)^{3n}F^{3gn\left(e-\frac{cf}{d}\right)-3gn(e+fx)}\text{ExpIntegralEi}\left(\frac{3fgn\log(F)(c+dx)}{d}\right)}{d^2}$$
$$-\frac{b^3\left(F^{eg+fgx}\right)^{3n}}{d(c+dx)}$$

```
[Out] -(a^3/(d*(c + d*x))) - (3*a^2*b*(F^(e*g + f*g*x))^n)/(d*(c + d*x)
) - (3*a*b^2*(F^(e*g + f*g*x))^(2*n))/(d*(c + d*x)) - (b^3*(F^(e*
g + f*g*x))^(3*n))/(d*(c + d*x)) + (3*a^2*b*f*F^((e - (c*f)/d)*g*
n - g*n*(e + f*x))*(F^(e*g + f*g*x))^n*g*n*ExpIntegralEi[(f*g*n*(
c + d*x)*Log[F])/d]*Log[F])/d^2 + (6*a*b^2*f*F^(2*(e - (c*f)/d)*g
*n - 2*g*n*(e + f*x))*(F^(e*g + f*g*x))^(2*n)*g*n*ExpIntegralEi[(
2*f*g*n*(c + d*x)*Log[F])/d]*Log[F])/d^2 + (3*b^3*f*F^(3*(e - (c*
f)/d)*g*n - 3*g*n*(e + f*x))*(F^(e*g + f*g*x))^(3*n)*g*n*ExpInteg
ralEi[(3*f*g*n*(c + d*x)*Log[F])/d]*Log[F])/d^2
```

Rubi [A] time = 0.849095, antiderivative size = 305, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.16$

$$-\frac{a^3}{d(c+dx)}+\frac{3a^2bfgn\log(F)\left(F^{eg+fgx}\right)^nF^{gn\left(e-\frac{cf}{d}\right)-gn(e+fx)}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right)}{d^2}$$
$$-\frac{3a^2b\left(F^{eg+fgx}\right)^n}{d(c+dx)}$$
$$+\frac{6ab^2fgn\log(F)\left(F^{eg+fgx}\right)^{2n}F^{2gn\left(e-\frac{cf}{d}\right)-2gn(e+fx)}\text{ExpIntegralEi}\left(\frac{2fgn\log(F)(c+dx)}{d}\right)}{d^2}$$
$$-\frac{3ab^2\left(F^{eg+fgx}\right)^{2n}}{d(c+dx)}$$
$$+\frac{3b^3fgn\log(F)\left(F^{eg+fgx}\right)^{3n}F^{3gn\left(e-\frac{cf}{d}\right)-3gn(e+fx)}\text{ExpIntegralEi}\left(\frac{3fgn\log(F)(c+dx)}{d}\right)}{d^2}$$
$$-\frac{b^3\left(F^{eg+fgx}\right)^{3n}}{d(c+dx)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)^3/(c + d*x)^2,x]
```

```
[Out] -(a^3/(d*(c + d*x))) - (3*a^2*b*(F^(e*g + f*g*x))^n)/(d*(c + d*x)
) - (3*a*b^2*(F^(e*g + f*g*x))^(2*n))/(d*(c + d*x)) - (b^3*(F^(e*
g + f*g*x))^(3*n))/(d*(c + d*x)) + (3*a^2*b*f*F^((e - (c*f)/d)*g*
n - g*n*(e + f*x))*(F^(e*g + f*g*x))^n*g*n*ExpIntegralEi[(f*g*n*(
c + d*x)*Log[F])/d]*Log[F])/d^2 + (6*a*b^2*f*F^(2*(e - (c*f)/d)*g
*n - 2*g*n*(e + f*x))*(F^(e*g + f*g*x))^(2*n)*g*n*ExpIntegralEi[(
2*f*g*n*(c + d*x)*Log[F])/d]*Log[F])/d^2 + (3*b^3*f*F^(3*(e - (c*
f)/d)*g*n - 3*g*n*(e + f*x))*(F^(e*g + f*g*x))^(3*n)*g*n*ExpInteg
ralEi[(3*f*g*n*(c + d*x)*Log[F])/d]*Log[F])/d^2
```

Rubi in Sympy [A] time = 73.3235, size = 313, normalized size = 1.03

$$\frac{3F^{gn(-3e-3fx)}F^{-\frac{3gn(cf-de)}{d}}b^3fgn\left(F^{g(e+fx)}\right)^{3n}\log(F)\operatorname{Ei}\left(\frac{fgn(3c+3dx)\log(F)}{d}\right)}{d^2}$$
$$+\frac{6F^{gn(-2e-2fx)}F^{-\frac{2gn(cf-de)}{d}}ab^2fgn\left(F^{g(e+fx)}\right)^{2n}\log(F)\operatorname{Ei}\left(\frac{fgn(2c+2dx)\log(F)}{d}\right)}{d^2}$$
$$+\frac{3F^{gn(-e-fx)}F^{-\frac{gn(cf-de)}{d}}a^2bfgn\left(F^{g(e+fx)}\right)^{n}\log(F)\operatorname{Ei}\left(\frac{fgn(c+dx)\log(F)}{d}\right)}{d^2}$$
$$-\frac{a^3}{d(c+dx)}-\frac{3a^2b\left(F^{g(e+fx)}\right)^n}{d(c+dx)}-\frac{3ab^2\left(F^{g(e+fx)}\right)^{2n}}{d(c+dx)}-\frac{b^3\left(F^{g(e+fx)}\right)^{3n}}{d(c+dx)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(F**(g*(f*x+e)))**n)**3/(d*x+c)**2,x)
```

```
[Out] 3*F**(g*n*(-3*e - 3*f*x))*F**(-3*g*n*(c*f - d*e)/d)*b**3*f*g*n*(F
**(g*(e + f*x)))**(3*n)*log(F)*Ei(f*g*n*(3*c + 3*d*x)*log(F)/d)/d
**2 + 6*F**(g*n*(-2*e - 2*f*x))*F**(-2*g*n*(c*f - d*e)/d)*a*b**2*
f*g*n*(F**(g*(e + f*x)))**(2*n)*log(F)*Ei(f*g*n*(2*c + 2*d*x)*log
(F)/d)/d**2 + 3*F**(g*n*(-e - f*x))*F**(-g*n*(c*f - d*e)/d)*a**2*
b*f*g*n*(F**(g*(e + f*x)))**n*log(F)*Ei(f*g*n*(c + d*x)*log(F)/d)
/d**2 - a**3/(d*(c + d*x)) - 3*a**2*b*(F**(g*(e + f*x)))**n/(d*(c
 + d*x)) - 3*a*b**2*(F**(g*(e + f*x)))**(2*n)/(d*(c + d*x)) - b**
3*(F**(g*(e + f*x)))**(3*n)/(d*(c + d*x))
```

Mathematica [A] time = 1.88003, size = 250, normalized size = 0.82

$$-\frac{a^3d - 3a^2bfgn\log(F)(c+dx)\left(F^{g(e+fx)}\right)^n F^{-\frac{fgn(c+dx)}{d}}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right) + 3a^2bd\left(F^{g(e+fx)}\right)^n - 6ab^2fgn\log(F)}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)^3/(c + d*x)^2,x]
```

```
[Out] -((a^3*d + 3*a^2*b*d*(F^(g*(e + f*x)))^n + 3*a*b^2*d*(F^(g*(e + f
*x)))^(2*n) + b^3*d*(F^(g*(e + f*x)))^(3*n) - (3*a^2*b*f*(F^(g*(e
 + f*x)))^n*g*n*(c + d*x)*ExpIntegralEi[(f*g*n*(c + d*x)*Log[F])/
d]*Log[F])/F^((f*g*n*(c + d*x))/d) - (6*a*b^2*f*(F^(g*(e + f*x)))
^(2*n)*g*n*(c + d*x)*ExpIntegralEi[(2*f*g*n*(c + d*x)*Log[F])/d]*
Log[F])/F^((2*f*g*n*(c + d*x))/d) - (3*b^3*f*(F^(g*(e + f*x)))^(3
*n)*g*n*(c + d*x)*ExpIntegralEi[(3*f*g*n*(c + d*x)*Log[F])/d]*Log
[F])/F^((3*f*g*n*(c + d*x))/d))/(d^2*(c + d*x)))
```

Maple [F] time = 0.031, size = 0, normalized size = 0.

$$\int \frac{\left(a + b\left(F^{g(fx+e)}\right)^n\right)^3}{(dx+c)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(F^(g*(f*x+e)))^n)^3/(d*x+c)^2,x)
```

```
[Out] int((a+b*(F^(g*(f*x+e)))^n)^3/(d*x+c)^2,x)
```

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

$$(F^{eg})^{3\,n}b^3\int \frac{\left(F^{fgx}\right)^{3\,n}}{d^2x^2+2\,cdx+c^2}\,dx + 3\,(F^{eg})^{2\,n}ab^2\int \frac{\left(F^{fgx}\right)^{2\,n}}{d^2x^2+2\,cdx+c^2}\,dx + 3\,(F^{eg})^{n}a^2b\int \frac{\left(F^{fgx}\right)^{n}}{d^2x^2+2\,cdx+c^2}\,dx - \frac{a^3}{d^2x+cd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^3/(d*x + c)^2,x, algorithm="maxima")
```

```
[Out] (F^(e*g))^(3*n)*b^3*integrate((F^(f*g*x))^(3*n)/(d^2*x^2 + 2*c*d*
x + c^2), x) + 3*(F^(e*g))^(2*n)*a*b^2*integrate((F^(f*g*x))^(2*n
)/(d^2*x^2 + 2*c*d*x + c^2), x) + 3*(F^(e*g))^n*a^2*b*integrate((
F^(f*g*x))^n/(d^2*x^2 + 2*c*d*x + c^2), x) - a^3/(d^2*x + c*d)
```

Fricas [A] time = 0.28413, size = 350, normalized size = 1.15

$$-\frac{3\,F^{fgnx+egn}a^2bd + 3\,F^{2\,fgnx+2\,egn}ab^2d + F^{3\,fgnx+3\,egn}b^3d + a^3d - 3\,\left(b^3dfgnx + b^3cfgn\right)F^{\frac{3\,(de-cf)gn}{d}}\,\mathrm{Ei}\left(\frac{3\,(dfgnx+cfgn)\log(F)}{d}\cdots\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^3/(d*x + c)^2,x, algorithm="fricas")
```

```
[Out] -(3*F^(f*g*n*x + e*g*n)*a^2*b*d + 3*F^(2*f*g*n*x + 2*e*g*n)*a*b^2
*d + F^(3*f*g*n*x + 3*e*g*n)*b^3*d + a^3*d - 3*(b^3*d*f*g*n*x + b
^3*c*f*g*n)*F^(3*(d*e - c*f)*g*n/d)*Ei(3*(d*f*g*n*x + c*f*g*n)*lo
g(F)/d)*log(F) - 6*(a*b^2*d*f*g*n*x + a*b^2*c*f*g*n)*F^(2*(d*e -
c*f)*g*n/d)*Ei(2*(d*f*g*n*x + c*f*g*n)*log(F)/d)*log(F) - 3*(a^2*
b*d*f*g*n*x + a^2*b*c*f*g*n)*F^((d*e - c*f)*g*n/d)*Ei((d*f*g*n*x
+ c*f*g*n)*log(F)/d)*log(F))/(d^3*x + c*d^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*(F**(g*(f*x+e)))**n)**3/(d*x+c)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(\left(F^{(fx+e)g}\right)^{n} b + a\right)^{3}}{(dx+c)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^3/(d*x + c)^2,x, algorithm="giac")
```

```
[Out] integrate(((F^((f*x + e)*g))^n*b + a)^3/(d*x + c)^2, x)
```

3.45 $\int \frac{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^3}{(c+dx)^3}\,dx$

Optimal. Leaf size=447

$$-\frac{a^3}{2d(c+dx)^2}+\frac{3a^2bf^2g^2n^2\log^2(F)\left(F^{eg+fgx}\right)^n F^{gn\left(e-\frac{cf}{d}\right)-gn(e+fx)}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right)}{2d^3}-\frac{3a^2bfgn\log(F)\left(F^{eg+fgx}\right)^n}{2d^2(c+dx)}-\frac{3a^2b\left(F^{eg+fgx}\right)^n}{2d(c+dx)^2}+\frac{6ab^2f^2g^2n^2\log^2(F)\left(F^{eg+fgx}\right)^{2n}F^{2gn\left(e-\frac{cf}{d}\right)-2gn(e+fx)}\text{ExpIntegralEi}\left(\frac{2fgn\log(F)(c+dx)}{d}\right)}{d^3}-\frac{3ab^2fgn\log(F)\left(F^{eg+fgx}\right)^{2n}}{d^2(c+dx)}-\frac{3ab^2\left(F^{eg+fgx}\right)^{2n}}{2d(c+dx)^2}+\frac{9b^3f^2g^2n^2\log^2(F)\left(F^{eg+fgx}\right)^{3n}F^{3gn\left(e-\frac{cf}{d}\right)-3gn(e+fx)}\text{ExpIntegralEi}\left(\frac{3fgn\log(F)(c+dx)}{d}\right)}{2d^3}-\frac{3b^3fgn\log(F)\left(F^{eg+fgx}\right)^{3n}}{2d^2(c+dx)}-\frac{b^3\left(F^{eg+fgx}\right)^{3n}}{2d(c+dx)^2}$$

```
[Out] -a^3/(2*d*(c + d*x)^2) - (3*a^2*b*(F^(e*g + f*g*x))^n)/(2*d*(c +
d*x)^2) - (3*a*b^2*(F^(e*g + f*g*x))^(2*n))/(2*d*(c + d*x)^2) - (
b^3*(F^(e*g + f*g*x))^(3*n))/(2*d*(c + d*x)^2) - (3*a^2*b*f*(F^(e
*g + f*g*x))^n*g*n*Log[F])/(2*d^2*(c + d*x)) - (3*a*b^2*f*(F^(e*g
 + f*g*x))^(2*n)*g*n*Log[F])/(d^2*(c + d*x)) - (3*b^3*f*(F^(e*g +
 f*g*x))^(3*n)*g*n*Log[F])/(2*d^2*(c + d*x)) + (3*a^2*b*f^2*F^((e
 - (c*f)/d)*g*n - g*n*(e + f*x))*(F^(e*g + f*g*x))^n*g^2*n^2*ExpI
ntegralEi[(f*g*n*(c + d*x)*Log[F])/d]*Log[F]^2)/(2*d^3) + (6*a*b^
2*f^2*F^(2*(e - (c*f)/d)*g*n - 2*g*n*(e + f*x))*(F^(e*g + f*g*x))
^(2*n)*g^2*n^2*ExpIntegralEi[(2*f*g*n*(c + d*x)*Log[F])/d]*Log[F]
^2)/d^3 + (9*b^3*f^2*F^(3*(e - (c*f)/d)*g*n - 3*g*n*(e + f*x))*(F
^(e*g + f*g*x))^(3*n)*g^2*n^2*ExpIntegralEi[(3*f*g*n*(c + d*x)*Lo
g[F])/d]*Log[F]^2)/(2*d^3)
```

Rubi [A] time = 1.19369, antiderivative size = 447, normalized size of antiderivative = 1., number of

steps used = 14, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.16$

$$-\frac{a^3}{2d(c+dx)^2} + \frac{3a^2bf^2g^2n^2\log^2(F)\left(F^{eg+fgx}\right)^n F^{gn\left(e-\frac{cf}{d}\right)-gn(e+fx)}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right)}{2d^3} - \frac{3a^2bfgn\log(F)\left(F^{eg+fgx}\right)^n}{2d^2(c+dx)} - \frac{3a^2b\left(F^{eg+fgx}\right)^n}{2d(c+dx)^2} + \frac{6ab^2f^2g^2n^2\log^2(F)\left(F^{eg+fgx}\right)^{2n} F^{2gn\left(e-\frac{cf}{d}\right)-2gn(e+fx)}\text{ExpIntegralEi}\left(\frac{2fgn\log(F)(c+dx)}{d}\right)}{d^3} - \frac{3ab^2fgn\log(F)\left(F^{eg+fgx}\right)^{2n}}{d^2(c+dx)} - \frac{3ab^2\left(F^{eg+fgx}\right)^{2n}}{2d(c+dx)^2} + \frac{9b^3f^2g^2n^2\log^2(F)\left(F^{eg+fgx}\right)^{3n} F^{3gn\left(e-\frac{cf}{d}\right)-3gn(e+fx)}\text{ExpIntegralEi}\left(\frac{3fgn\log(F)(c+dx)}{d}\right)}{2d^3} - \frac{3b^3fgn\log(F)\left(F^{eg+fgx}\right)^{3n}}{2d^2(c+dx)} - \frac{b^3\left(F^{eg+fgx}\right)^{3n}}{2d(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)^3/(c + d*x)^3,x]
```

```
[Out] -a^3/(2*d*(c + d*x)^2) - (3*a^2*b*(F^(e*g + f*g*x))^n)/(2*d*(c +
d*x)^2) - (3*a*b^2*(F^(e*g + f*g*x))^(2*n))/(2*d*(c + d*x)^2) - (
b^3*(F^(e*g + f*g*x))^(3*n))/(2*d*(c + d*x)^2) - (3*a^2*b*f*(F^(e
*g + f*g*x))^n*g*n*Log[F])/(2*d^2*(c + d*x)) - (3*a*b^2*f*(F^(e*g
 + f*g*x))^(2*n)*g*n*Log[F])/(d^2*(c + d*x)) - (3*b^3*f*(F^(e*g +
 f*g*x))^(3*n)*g*n*Log[F])/(2*d^2*(c + d*x)) + (3*a^2*b*f^2*F^((e
 - (c*f)/d)*g*n - g*n*(e + f*x))*(F^(e*g + f*g*x))^n*g^2*n^2*ExpI
ntegralEi[(f*g*n*(c + d*x)*Log[F])/d]*Log[F]^2)/(2*d^3) + (6*a*b^
2*f^2*F^(2*(e - (c*f)/d)*g*n - 2*g*n*(e + f*x))*(F^(e*g + f*g*x))
^(2*n)*g^2*n^2*ExpIntegralEi[(2*f*g*n*(c + d*x)*Log[F])/d]*Log[F]
^2)/d^3 + (9*b^3*f^2*F^(3*(e - (c*f)/d)*g*n - 3*g*n*(e + f*x))*(F
^(e*g + f*g*x))^(3*n)*g^2*n^2*ExpIntegralEi[(3*f*g*n*(c + d*x)*Lo
g[F])/d]*Log[F]^2)/(2*d^3)
```

Rubi in Sympy [A] time = 124.056, size = 457, normalized size = 1.02

$$\frac{9F^{gn(-3e-3fx)}F^{-\frac{3gn(cf-de)}{d}}b^3f^2g^2n^2\left(F^{g(e+fx)}\right)^{3n}\log(F)^2\operatorname{Ei}\left(\frac{fgn(3c+3dx)\log(F)}{d}\right)}{2d^3}+\frac{6F^{gn(-2e-2fx)}F^{-\frac{2gn(cf-de)}{d}}ab^2f^2g^2n^2\left(F^{g(e+fx)}\right)^{2n}\log(F)^2\operatorname{Ei}\left(\frac{fgn(2c+2dx)\log(F)}{d}\right)}{d^3}+\frac{3F^{gn(-e-fx)}F^{-\frac{gn(cf-de)}{d}}a^2bf^2g^2n^2\left(F^{g(e+fx)}\right)^{n}\log(F)^2\operatorname{Ei}\left(\frac{fgn(c+dx)\log(F)}{d}\right)}{2d^3}-\frac{a^3}{2d(c+dx)^2}-\frac{3a^2b\left(F^{g(e+fx)}\right)^n}{2d(c+dx)^2}-\frac{3a^2bfgn\left(F^{g(e+fx)}\right)^n\log(F)}{2d^2(c+dx)}-\frac{3ab^2\left(F^{g(e+fx)}\right)^{2n}}{2d(c+dx)^2}-\frac{3ab^2fgn\left(F^{g(e+fx)}\right)^{2n}\log(F)}{d^2(c+dx)}-\frac{b^3\left(F^{g(e+fx)}\right)^{3n}}{2d(c+dx)^2}-\frac{3b^3fgn\left(F^{g(e+fx)}\right)^{3n}\log(F)}{2d^2(c+dx)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(F**(g*(f*x+e)))**n)**3/(d*x+c)**3,x)
```

```
[Out] 9*F**(g*n*(-3*e - 3*f*x))*F**(-3*g*n*(c*f - d*e)/d)*b**3*f**2*g**
2*n**2*(F**(g*(e + f*x)))**(3*n)*log(F)**2*Ei(f*g*n*(3*c + 3*d*x)
*log(F)/d)/(2*d**3) + 6*F**(g*n*(-2*e - 2*f*x))*F**(-2*g*n*(c*f -
 d*e)/d)*a*b**2*f**2*g**2*n**2*(F**(g*(e + f*x)))**(2*n)*log(F)**
2*Ei(f*g*n*(2*c + 2*d*x)*log(F)/d)/d**3 + 3*F**(g*n*(-e - f*x))*F
**(-g*n*(c*f - d*e)/d)*a**2*b*f**2*g**2*n**2*(F**(g*(e + f*x)))**
n*log(F)**2*Ei(f*g*n*(c + d*x)*log(F)/d)/(2*d**3) - a**3/(2*d*(c
+ d*x)**2) - 3*a**2*b*(F**(g*(e + f*x)))**n/(2*d*(c + d*x)**2) -
3*a**2*b*f*g*n*(F**(g*(e + f*x)))**n*log(F)/(2*d**2*(c + d*x)) -
3*a*b**2*(F**(g*(e + f*x)))**(2*n)/(2*d*(c + d*x)**2) - 3*a*b**2*
f*g*n*(F**(g*(e + f*x)))**(2*n)*log(F)/(d**2*(c + d*x)) - b**3*(F
**(g*(e + f*x)))**(3*n)/(2*d*(c + d*x)**2) - 3*b**3*f*g*n*(F**(g*
(e + f*x)))**(3*n)*log(F)/(2*d**2*(c + d*x))
```

Mathematica [A] time = 0.982503, size = 325, normalized size = 0.73

$$-\frac{a^3d^2-3a^2bf^2g^2n^2\log^2(F)(c+dx)^2\left(F^{g(e+fx)}\right)^nF^{-\frac{fgn(c+dx)}{d}}\text{ExpIntegralEi}\left(\frac{fgn\log(F)(c+dx)}{d}\right)+3a^2bd\left(F^{g(e+fx)}\right)^n(fgn\log(F}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)^3/(c + d*x)^3,x]
```

```
[Out] -(a^3*d^2 - (3*a^2*b*f^2*(F^(g*(e + f*x)))^n*g^2*n^2*(c + d*x)^2*
ExpIntegralEi[(f*g*n*(c + d*x)*Log[F])/d]*Log[F]^2)/F^((f*g*n*(c
+ d*x))/d) - (12*a*b^2*f^2*(F^(g*(e + f*x)))^(2*n)*g^2*n^2*(c + d
*x)^2*ExpIntegralEi[(2*f*g*n*(c + d*x)*Log[F])/d]*Log[F]^2)/F^((2
*f*g*n*(c + d*x))/d) - (9*b^3*f^2*(F^(g*(e + f*x)))^(3*n)*g^2*n^2
*(c + d*x)^2*ExpIntegralEi[(3*f*g*n*(c + d*x)*Log[F])/d]*Log[F]^2
)/F^((3*f*g*n*(c + d*x))/d) + 3*a^2*b*d*(F^(g*(e + f*x)))^n*(d +
f*g*n*(c + d*x)*Log[F]) + 3*a*b^2*d*(F^(g*(e + f*x)))^(2*n)*(d +
2*f*g*n*(c + d*x)*Log[F]) + b^3*d*(F^(g*(e + f*x)))^(3*n)*(d + 3*
f*g*n*(c + d*x)*Log[F]))/(2*d^3*(c + d*x)^2)
```

Maple [F] time = 0.033, size = 0, normalized size = 0.

$$\int \frac{\left(a + b \left(F^{g(fx+e)}\right)^{n}\right)^{3}}{(dx+c)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(F^(g*(f*x+e)))^n)^3/(d*x+c)^3,x)
```

```
[Out] int((a+b*(F^(g*(f*x+e)))^n)^3/(d*x+c)^3,x)
```

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

$$(F^{eg})^{3n} b^3 \int \frac{\left(F^{fgx}\right)^{3n}}{d^3x^3 + 3\,cd^2x^2 + 3\,c^2dx + c^3}\, dx + 3\,(F^{eg})^{2n} ab^2 \int \frac{\left(F^{fgx}\right)^{2n}}{d^3x^3 + 3\,cd^2x^2 + 3\,c^2dx + c^3}\, dx + 3\,(F^{eg})^{n} a^2 b \int \frac{\left(F^{fgx}\right)^{n}}{d^3x^3 + 3\,cd^2x^2 + 3\,c^2dx + c^3}\, dx - \frac{a^3}{2\,(d^3x^2 + 2\,cd^2x + c^2d)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^3/(d*x + c)^3,x, algorithm="maxima")
```

```
[Out] (F^(e*g))^(3*n)*b^3*integrate((F^(f*g*x))^(3*n)/(d^3*x^3 + 3*c*d^
2*x^2 + 3*c^2*d*x + c^3), x) + 3*(F^(e*g))^(2*n)*a*b^2*integrate(
(F^(f*g*x))^(2*n)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3), x) +
 3*(F^(e*g))^n*a^2*b*integrate((F^(f*g*x))^n/(d^3*x^3 + 3*c*d^2*x
^2 + 3*c^2*d*x + c^3), x) - 1/2*a^3/(d^3*x^2 + 2*c*d^2*x + c^2*d)
```

Fricas [A] time = 0.280502, size = 641, normalized size = 1.43

$$-\frac{a^3d^2 - 9\left(b^3d^2f^2g^2n^2x^2 + 2\,b^3cdf^2g^2n^2x + b^3c^2f^2g^2n^2\right)F^{\frac{3(de-cf)gn}{d}}\,\mathrm{Ei}\left(\frac{3\,(dfgnx+cfgn)\log(F)}{d}\right)\log\left(F\right)^2 - 12\left(ab^2d^2f^2g^2n^2x^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^3/(d*x + c)^3,x, algorithm="fricas")
```

```
[Out] -1/2*(a^3*d^2 - 9*(b^3*d^2*f^2*g^2*n^2*x^2 + 2*b^3*c*d*f^2*g^2*n^
2*x + b^3*c^2*f^2*g^2*n^2)*F^(3*(d*e - c*f)*g*n/d)*Ei(3*(d*f*g*n*
x + c*f*g*n)*log(F)/d)*log(F)^2 - 12*(a*b^2*d^2*f^2*g^2*n^2*x^2 +
 2*a*b^2*c*d*f^2*g^2*n^2*x + a*b^2*c^2*f^2*g^2*n^2)*F^(2*(d*e - c
*f)*g*n/d)*Ei(2*(d*f*g*n*x + c*f*g*n)*log(F)/d)*log(F)^2 - 3*(a^2
*b*d^2*f^2*g^2*n^2*x^2 + 2*a^2*b*c*d*f^2*g^2*n^2*x + a^2*b*c^2*f^
2*g^2*n^2)*F^((d*e - c*f)*g*n/d)*Ei((d*f*g*n*x + c*f*g*n)*log(F)/
d)*log(F)^2 + (b^3*d^2 + 3*(b^3*d^2*f*g*n*x + b^3*c*d*f*g*n)*log(
F))*F^(3*f*g*n*x + 3*e*g*n) + 3*(a*b^2*d^2 + 2*(a*b^2*d^2*f*g*n*x
 + a*b^2*c*d*f*g*n)*log(F))*F^(2*f*g*n*x + 2*e*g*n) + 3*(a^2*b*d^
2 + (a^2*b*d^2*f*g*n*x + a^2*b*c*d*f*g*n)*log(F))*F^(f*g*n*x + e*
g*n))/(d^5*x^2 + 2*c*d^4*x + c^2*d^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(F**(g*(f*x+e)))**n)**3/(d*x+c)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(\left(F^{(fx+e)g}\right)^n b + a\right)^3}{(dx + c)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^3/(d*x + c)^3,x, algorithm="giac")
```

```
[Out] integrate(((F^((f*x + e)*g))^n*b + a)^3/(d*x + c)^3, x)
```

3.46 $\int \frac{(c+dx)^3}{a+b\left(F^{g(e+fx)}\right)^n} \, dx$

Optimal. Leaf size=192

$$\frac{6d^2(c+dx)\text{PolyLog}\left(3,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{af^3g^3n^3\log^3(F)}-\frac{3d(c+dx)^2\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{af^2g^2n^2\log^2(F)}-\frac{6d^3\text{PolyLog}\left(4,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{af^4g^4n^4\log^4(F)}-\frac{(c+dx)^3\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{afgn\log(F)}+\frac{(c+dx)^4}{4ad}$$

```
[Out] (c + d*x)^4/(4*a*d) - ((c + d*x)^3*Log[1 + (b*(F^(g*(e + f*x)))^n
)/a])/(a*f*g*n*Log[F]) - (3*d*(c + d*x)^2*PolyLog[2, -((b*(F^(g*(
e + f*x)))^n)/a)])/(a*f^2*g^2*n^2*Log[F]^2) + (6*d^2*(c + d*x)*Po
lyLog[3, -((b*(F^(g*(e + f*x)))^n)/a)])/(a*f^3*g^3*n^3*Log[F]^3)
- (6*d^3*PolyLog[4, -((b*(F^(g*(e + f*x)))^n)/a)])/(a*f^4*g^4*n^4
*Log[F]^4)
```

Rubi [A] time = 0.547824, antiderivative size = 192, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.24

$$\frac{6d^2(c+dx)\text{PolyLog}\left(3,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{af^3g^3n^3\log^3(F)}-\frac{3d(c+dx)^2\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{af^2g^2n^2\log^2(F)}-\frac{6d^3\text{PolyLog}\left(4,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{af^4g^4n^4\log^4(F)}-\frac{(c+dx)^3\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{afgn\log(F)}+\frac{(c+dx)^4}{4ad}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^3/(a + b*(F^(g*(e + f*x)))^n),x]
```


```
[Out] (c + d*x)^4/(4*a*d) - ((c + d*x)^3*Log[1 + (b*(F^(g*(e + f*x)))^n
)/a])/(a*f*g*n*Log[F]) - (3*d*(c + d*x)^2*PolyLog[2, -((b*(F^(g*(
e + f*x)))^n)/a)])/(a*f^2*g^2*n^2*Log[F]^2) + (6*d^2*(c + d*x)*Po
lyLog[3, -((b*(F^(g*(e + f*x)))^n)/a)])/(a*f^3*g^3*n^3*Log[F]^3)
- (6*d^3*PolyLog[4, -((b*(F^(g*(e + f*x)))^n)/a)])/(a*f^4*g^4*n^4
*Log[F]^4)
```

Rubi in Sympy [A] time = 94.0252, size = 160, normalized size = 0.83

$$\frac{6d^3\operatorname{Li}_4\left(-\frac{a\left(F^{g(e+fx)}\right)^{-n}}{b}\right)}{af^4g^4n^4\log(F)^4}+\frac{6d^2(c+dx)\operatorname{Li}_3\left(-\frac{a\left(F^{g(e+fx)}\right)^{-n}}{b}\right)}{af^3g^3n^3\log(F)^3}+\frac{3d(c+dx)^2\operatorname{Li}_2\left(-\frac{a\left(F^{g(e+fx)}\right)^{-n}}{b}\right)}{af^2g^2n^2\log(F)^2}-\frac{(c+dx)^3\log\left(\frac{a\left(F^{g(e+fx)}\right)^{-n}}{b}+1\right)}{afgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**3/(a+b*(F**(g*(f*x+e)))**n),x)
```

```
[Out] 6*d**3*polylog(4, -a*(F**(g*(e + f*x)))**(-n)/b)/(a*f**4*g**4*n**
4*log(F)**4) + 6*d**2*(c + d*x)*polylog(3, -a*(F**(g*(e + f*x)))*
*(-n)/b)/(a*f**3*g**3*n**3*log(F)**3) + 3*d*(c + d*x)**2*polylog(
2, -a*(F**(g*(e + f*x)))**(-n)/b)/(a*f**2*g**2*n**2*log(F)**2) -
(c + d*x)**3*log(a*(F**(g*(e + f*x)))**(-n)/b + 1)/(a*f*g*n*log(F
))
```

Mathematica [A] time = 2.84445, size = 0, normalized size = 0.

$$\int \frac{(c+dx)^3}{a+b\left(F^{g(e+fx)}\right)^n}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(c + d*x)^3/(a + b*(F^(g*(e + f*x)))^n),x]
```

```
[Out] Integrate[(c + d*x)^3/(a + b*(F^(g*(e + f*x)))^n), x]
```

Maple [B] time = 0.083, size = 2495, normalized size = 13.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^3/(a+b*(F^(g*(f*x+e)))^n),x)
```

[Out] -3/n/g^2/f^2/ln(F)^2*c^2*d*(ln(F^(g*(f*x+e)))-g*(f*x+e)*ln(F))/a*
ln((F^(g*(f*x+e)))^n)+3/n/g^2/f^2/ln(F)^2*c^2*d*(ln(F^(g*(f*x+e))
)-g*(f*x+e)*ln(F))/a*ln(a+b*(F^(g*(f*x+e)))^n)-3/n/g/f/ln(F)*c*d^
2/a*ln(1+b*(F^(g*(f*x+e)))^n/a)*x^2+3/n/g/f^3/ln(F)*c*d^2/a*ln(1+
b*(F^(g*(f*x+e)))^n/a)*e^2+3/n/g^3/f^3/ln(F)^3*c*d^2/a*ln(1+b*(F^
(g*(f*x+e)))^n/a)*(ln(F^(g*(f*x+e)))-g*(f*x+e)*ln(F))^2-6/n^2/g^2
/f^2/ln(F)^2*c*d^2/a*polylog(2,-b*(F^(g*(f*x+e)))^n/a)*x-3/n/g^2/
f^4/ln(F)^2*d^3*(ln(F^(g*(f*x+e)))-g*(f*x+e)*ln(F))/a*ln(1+b*(F^(
g*(f*x+e)))^n/a)*e^2-3/n/g^3/f^4/ln(F)^3*d^3*(ln(F^(g*(f*x+e)))-g
*(f*x+e)*ln(F))^2/a*ln(1+b*(F^(g*(f*x+e)))^n/a)*e-3/n/g/f/ln(F)*c
^2*d/a*ln(1+b*(F^(g*(f*x+e)))^n/a)*x-3/n/g/f^2/ln(F)*c^2*d/a*ln(1
+b*(F^(g*(f*x+e)))^n/a)*e-3/n/g^2/f^2/ln(F)^2*c^2*d/a*ln(1+b*(F^(
g*(f*x+e)))^n/a)*(ln(F^(g*(f*x+e)))-g*(f*x+e)*ln(F))-3/n/g^3/f^4/
ln(F)^3*d^3*e*(ln(F^(g*(f*x+e)))-g*(f*x+e)*ln(F))^2/a*ln((F^(g*(f
*x+e)))^n)-6*d^3*polylog(4,-b*(F^(g*(f*x+e)))^n/a)/a/f^4/g^4/n^4/
ln(F)^4+3*c*d^2/a*x^3-6/g/f^2/ln(F)*c*d^2*(ln(F^(g*(f*x+e)))-g*(f
*x+e)*ln(F))/a*x*e+3/n/g/f^3/ln(F)*c*d^2*e^2/a*ln((F^(g*(f*x+e)))
^n)-3/n/g/f^3/ln(F)*c*d^2*e^2/a*ln(a+b*(F^(g*(f*x+e)))^n)+3/n/g^3
/f^4/ln(F)^3*d^3*e*(ln(F^(g*(f*x+e)))-g*(f*x+e)*ln(F))^2/a*ln(a+b
(F^(g(f*x+e)))^n)+3/n/g^3/f^3/ln(F)^3*c*d^2*(ln(F^(g*(f*x+e)))-
g*(f*x+e)*ln(F))^2/a*ln((F^(g*(f*x+e)))^n)-3/n/g/f^2/ln(F)*c^2*d*
e/a*ln((F^(g*(f*x+e)))^n)+3/n/g/f^2/ln(F)*c^2*d*e/a*ln(a+b*(F^(g*
(f*x+e)))^n)-3/n/g^3/f^3/ln(F)^3*c*d^2*(ln(F^(g*(f*x+e)))-g*(f*x+
e)*ln(F))^2/a*ln(a+b*(F^(g*(f*x+e)))^n)-3/n/g^2/f^4/ln(F)^2*d^3*e
^2*(ln(F^(g*(f*x+e)))-g*(f*x+e)*ln(F))/a*ln((F^(g*(f*x+e)))^n)+3/
n/g^2/f^4/ln(F)^2*d^3*e^2*(ln(F^(g*(f*x+e)))-g*(f*x+e)*ln(F))/a*l
n(a+b*(F^(g*(f*x+e)))^n)+1/n/g^4/f^4/ln(F)^4*d^3*(ln(F^(g*(f*x+e)
))-g*(f*x+e)*ln(F))^3/a*ln(a+b*(F^(g*(f*x+e)))^n)-3/n^2/g^2/f^2/l
n(F)^2*c^2*d/a*polylog(2,-b*(F^(g*(f*x+e)))^n/a)+6/n^3/g^3/f^3/ln
(F)^3*c*d^2/a*polylog(3,-b*(F^(g*(f*x+e)))^n/a)-1/n/g^4/f^4/ln(F)
^4*d^3*(ln(F^(g*(f*x+e)))-g*(f*x+e)*ln(F))^3/a*ln(1+b*(F^(g*(f*x+
e)))^n/a)-1/n/g/f^4/ln(F)*d^3*e^3/a*ln(1+b*(F^(g*(f*x+e)))^n/a)-3
/n^2/g^2/f^2/ln(F)^2*d^3/a*polylog(2,-b*(F^(g*(f*x+e)))^n/a)*x^2+
3/g/f/ln(F)*c^2*d/a*x*(ln(F^(g*(f*x+e)))-g*(f*x+e)*ln(F))-1/n/g^4
/f^4/ln(F)^4*d^3*(ln(F^(g*(f*x+e)))-g*(f*x+e)*ln(F))^3/a*ln((F^(g
*(f*x+e)))^n)-3/g/f/ln(F)*c^2*d/a*ln(F^(g*(f*x+e)))*x-1/n/g/f^4/l
n(F)*d^3*e^3/a*ln((F^(g*(f*x+e)))^n)+1/n/g/f^4/ln(F)*d^3*e^3/a*ln
(a+b*(F^(g*(f*x+e)))^n)+3/g/f^3/ln(F)*d^3/a*x*e^2*(ln(F^(g*(f*x+e
)))-g*(f*x+e)*ln(F))+3/g^2/f^3/ln(F)^2*d^3/a*x*e*(ln(F^(g*(f*x+e)
))-g*(f*x+e)*ln(F))^2-3/g^2/f^2/ln(F)^2*c*d^2*(ln(F^(g*(f*x+e)))-
g*(f*x+e)*ln(F))^2/a*x-1/n/g/f/ln(F)*d^3/a*ln(1+b*(F^(g*(f*x+e)))
^n/a)*x^3+6/n^3/g^3/f^3/ln(F)^3*d^3/a*polylog(3,-b*(F^(g*(f*x+e))
)^n/a)*x-6/g/f/ln(F)*c*d^2/a*ln(F^(g*(f*x+e)))*x^2+6/g^2/f^2/ln(F
)^2*c*d^2/a*ln(F^(g*(f*x+e)))^2*x-3/g/f/ln(F)*d^3/a*ln(F^(g*(f*x+
e)))*x^3+9/2/g^2/f^2/ln(F)^2*d^3/a*ln(F^(g*(f*x+e)))^2*x^2-3/g^3/
f^3/ln(F)^3*d^3/a*ln(F^(g*(f*x+e)))^3*x-2/g^3/f^3/ln(F)^3*c*d^2/a
ln(F^(g(f*x+e)))^3+3/2/g^2/f^2/ln(F)^2*c^2*d/a*ln(F^(g*(f*x+e))
)^2+1/g^3/f^3/ln(F)^3*d^3/a*x*(ln(F^(g*(f*x+e)))-g*(f*x+e)*ln(F))
^3+1/n/g/f/ln(F)*c^3/a*ln((F^(g*(f*x+e)))^n)-1/n/g/f/ln(F)*c^3/a*
ln(a+b*(F^(g*(f*x+e)))^n)+3*c^2*d/a*x^2+6/n/g^2/f^3/ln(F)^2*c*d^2
e(ln(F^(g*(f*x+e)))-g*(f*x+e)*ln(F))/a*ln((F^(g*(f*x+e)))^n)+6/
n/g^2/f^3/ln(F)^2*c*d^2/a*ln(1+b*(F^(g*(f*x+e)))^n/a)*e*(ln(F^(g*
(f*x+e)))-g*(f*x+e)*ln(F))-6/n/g^2/f^3/ln(F)^2*c*d^2*e*(ln(F^(g*(
f*x+e)))-g*(f*x+e)*ln(F))/a*ln(a+b*(F^(g*(f*x+e)))^n)+d^3/a*x^4+3

```
/f*c^2*d/a*x*e-3/f^2*c*d^2*e^2/a*x+1/f^3*d^3/a*x*e^3+3/4/g^4/f^4/
ln(F)^4*d^3/a*ln(F^(g*(f*x+e)))^4
```

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

$$-c^3\left(\frac{\log\left(\left(F^{fgx+eg}\right)^n b+a\right)}{afgn\log(F)}-\frac{\log\left(\left(F^{fgx+eg}\right)^n\right)}{afgn\log(F)}\right)+\int\frac{d^3x^3+3\,cd^2x^2+3\,c^2dx}{\left(F^{fgx}\right)^n(F^{eg})^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x + c)^3/((F^((f*x + e)*g))^n*b + a),x, algorithm="maxima")
```

```
[Out] -c^3*(log((F^(f*g*x + e*g))^n*b + a)/(a*f*g*n*log(F)) - log((F^(f
*g*x + e*g))^n)/(a*f*g*n*log(F))) + integrate((d^3*x^3 + 3*c*d^2*
x^2 + 3*c^2*d*x)/((F^(f*g*x))^n*(F^(e*g))^n*b + a), x)
```

Fricas [A] time = 0.266186, size = 558, normalized size = 2.91

$$\frac{4\left(d^3e^3-3\,cd^2e^2f+3\,c^2def^2-c^3f^3\right)g^3n^3\log\left(F^{fgnx+egn}b+a\right)\log(F)^3+\left(d^3f^4g^4n^4x^4+4\,cd^2f^4g^4n^4x^3+6\,c^2df^4g^4n^4x^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x + c)^3/((F^((f*x + e)*g))^n*b + a),x, algorithm="fricas")
```

```
[Out] 1/4*(4*(d^3*e^3 - 3*c*d^2*e^2*f + 3*c^2*d*e*f^2 - c^3*f^3)*g^3*n^
3*log(F^(f*g*n*x + e*g*n)*b + a)*log(F)^3 + (d^3*f^4*g^4*n^4*x^4
+ 4*c*d^2*f^4*g^4*n^4*x^3 + 6*c^2*d*f^4*g^4*n^4*x^2 + 4*c^3*f^4*g
^4*n^4*x)*log(F)^4 - 4*(d^3*f^3*g^3*n^3*x^3 + 3*c*d^2*f^3*g^3*n^3
*x^2 + 3*c^2*d*f^3*g^3*n^3*x + (d^3*e^3 - 3*c*d^2*e^2*f + 3*c^2*d
*e*f^2)*g^3*n^3)*log(F)^3*log((F^(f*g*n*x + e*g*n)*b + a)/a) - 12
*(d^3*f^2*g^2*n^2*x^2 + 2*c*d^2*f^2*g^2*n^2*x + c^2*d*f^2*g^2*n^2
)*dilog(-(F^(f*g*n*x + e*g*n)*b + a)/a + 1)*log(F)^2 - 24*d^3*pol
ylog(4, -F^(f*g*n*x + e*g*n)*b/a) + 24*(d^3*f*g*n*x + c*d^2*f*g*n
)*log(F)*polylog(3, -F^(f*g*n*x + e*g*n)*b/a))/(a*f^4*g^4*n^4*log
(F)^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**3/(a+b*(F**(g*(f*x+e)))**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx+c)^3}{\left(F^{(fx+e)g}\right)^n b + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^3/((F^((f*x + e)*g))^n*b + a),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^3/((F^((f*x + e)*g))^n*b + a), x)
```

3.47 $\int \frac{(c+dx)^2}{a+b\left(F^{g(e+fx)}\right)^n}\,dx$

Optimal. Leaf size=145

$$-\frac{2d(c+dx)\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{af^2g^2n^2\log^2(F)}+\frac{2d^2\text{PolyLog}\left(3,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{af^3g^3n^3\log^3(F)}-\frac{(c+dx)^2\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{afgn\log(F)}+\frac{(c+dx)^3}{3ad}$$

```
[Out] (c + d*x)^3/(3*a*d) - ((c + d*x)^2*Log[1 + (b*(F^(g*(e + f*x)))^n
)/a])/(a*f*g*n*Log[F]) - (2*d*(c + d*x)*PolyLog[2, -((b*(F^(g*(e
+ f*x)))^n)/a)])/(a*f^2*g^2*n^2*Log[F]^2) + (2*d^2*PolyLog[3, -((
b*(F^(g*(e + f*x)))^n)/a)])/(a*f^3*g^3*n^3*Log[F]^3)
```

Rubi [A] time = 0.464419, antiderivative size = 145, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$-\frac{2d(c+dx)\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{af^2g^2n^2\log^2(F)}+\frac{2d^2\text{PolyLog}\left(3,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{af^3g^3n^3\log^3(F)}-\frac{(c+dx)^2\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{afgn\log(F)}+\frac{(c+dx)^3}{3ad}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^2/(a + b*(F^(g*(e + f*x)))^n),x]
```

```
[Out] (c + d*x)^3/(3*a*d) - ((c + d*x)^2*Log[1 + (b*(F^(g*(e + f*x)))^n
)/a])/(a*f*g*n*Log[F]) - (2*d*(c + d*x)*PolyLog[2, -((b*(F^(g*(e
+ f*x)))^n)/a)])/(a*f^2*g^2*n^2*Log[F]^2) + (2*d^2*PolyLog[3, -((
b*(F^(g*(e + f*x)))^n)/a)])/(a*f^3*g^3*n^3*Log[F]^3)
```

Rubi in Sympy [A] time = 52.758, size = 114, normalized size = 0.79

$$\frac{2d^2\,\text{Li}_3\left(-\frac{a\left(F^{g(e+fx)}\right)^{-n}}{b}\right)}{af^3g^3n^3\log(F)^3}+\frac{2d\,(c+dx)\,\text{Li}_2\left(-\frac{a\left(F^{g(e+fx)}\right)^{-n}}{b}\right)}{af^2g^2n^2\log(F)^2}-\frac{(c+dx)^2\log\left(\frac{a\left(F^{g(e+fx)}\right)^{-n}}{b}+1\right)}{afgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**2/(a+b*(F**(g*(f*x+e)))**n),x)
```

```
[Out] 2*d**2*polylog(3, -a*(F**(g*(e + f*x)))**(-n)/b)/(a*f**3*g**3*n**
3*log(F)**3) + 2*d*(c + d*x)*polylog(2, -a*(F**(g*(e + f*x)))**(-
n)/b)/(a*f**2*g**2*n**2*log(F)**2) - (c + d*x)**2*log(a*(F**(g*(e
 + f*x)))**(-n)/b + 1)/(a*f*g*n*log(F))
```

Mathematica [A] time = 2.66148, size = 0, normalized size = 0.

$$\int \frac{(c+dx)^2}{a+b\left(F^{g(e+fx)}\right)^n}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(c + d*x)^2/(a + b*(F^(g*(e + f*x)))^n),x]
```

```
[Out] Integrate[(c + d*x)^2/(a + b*(F^(g*(e + f*x)))^n), x]
```

Maple [B] time = 0.089, size = 1341, normalized size = 9.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^2/(a+b*(F^(g*(f*x+e)))^n),x)
```

```
[Out] d^2/a*x^3+2*d^2*polylog(3,-b*(F^(g*(f*x+e)))^n/a)/a/f^3/g^3/n^3/l
n(F)^3+2/ln(F)^2/f^3/g^2/n*d^2*e*(ln(F^(g*(f*x+e)))-g*(f*x+e)*ln(
F))/a*ln((F^(g*(f*x+e)))^n)-2/ln(F)^2/f^3/g^2/n*d^2*e*(ln(F^(g*(f
*x+e)))-g*(f*x+e)*ln(F))/a*ln(a+b*(F^(g*(f*x+e)))^n)-2/ln(F)/f^2/
g/n*c*d*e/a*ln((F^(g*(f*x+e)))^n)+2/ln(F)/f^2/g/n*c*d*e/a*ln(a+b*
(F^(g*(f*x+e)))^n)+2/ln(F)^2/f^3/g^2/n*d^2*e/a*ln(1+b*(F^(g*(f*x+
e)))^n/a)*(ln(F^(g*(f*x+e)))-g*(f*x+e)*ln(F))-2/ln(F)/f/g/n*c*d/a
*ln(1+b*(F^(g*(f*x+e)))^n/a)*x-2/ln(F)/f^2/g/n*c*d/a*ln(1+b*(F^(g
*(f*x+e)))^n/a)*e+2/f*c*d/a*x*e-1/f^2*d^2/a*x*e^2-2/ln(F)/f/g*d^2
/a*ln(F^(g*(f*x+e)))*x^2+2/ln(F)^2/f^2/g^2*d^2/a*ln(F^(g*(f*x+e))
)^2*x+1/ln(F)^2/f^2/g^2*c*d/a*ln(F^(g*(f*x+e)))^2-1/ln(F)^2/f^2/g
^2*d^2/a*x*(ln(F^(g*(f*x+e)))-g*(f*x+e)*ln(F))^2+1/ln(F)/f/g/n*c^
2/a*ln((F^(g*(f*x+e)))^n)-1/ln(F)/f/g/n*c^2/a*ln(a+b*(F^(g*(f*x+e
)))^n)+2*c*d/a*x^2-2/ln(F)/f^2/g*d^2/a*x*e*(ln(F^(g*(f*x+e)))-g*(
f*x+e)*ln(F))+1/ln(F)^3/f^3/g^3/n*d^2*(ln(F^(g*(f*x+e)))-g*(f*x+e
```

```
)*ln(F))^2/a*ln((F^(g*(f*x+e)))^n)+2/ln(F)/f/g*c*d/a*x*(ln(F^(g*(
f*x+e)))-g*(f*x+e)*ln(F))-1/ln(F)/f^3/g/n*d^2*e^2/a*ln(a+b*(F^(g*
(f*x+e)))^n)-2/ln(F)^2/f^2/g^2/n*c*d*(ln(F^(g*(f*x+e)))-g*(f*x+e)
*ln(F))/a*ln((F^(g*(f*x+e)))^n)+2/ln(F)^2/f^2/g^2/n*c*d*(ln(F^(g*
(f*x+e)))-g*(f*x+e)*ln(F))/a*ln(a+b*(F^(g*(f*x+e)))^n)-2/ln(F)^2/
f^2/g^2/n*c*d/a*ln(1+b*(F^(g*(f*x+e)))^n/a)*(ln(F^(g*(f*x+e)))-g*
(f*x+e)*ln(F))-2/ln(F)/f/g*c*d/a*ln(F^(g*(f*x+e)))*x+1/ln(F)/f^3/
g/n*d^2*e^2/a*ln(1+b*(F^(g*(f*x+e)))^n/a)+1/ln(F)^3/f^3/g^3/n*d^2
*(ln(F^(g*(f*x+e)))-g*(f*x+e)*ln(F))^2/a*ln(1+b*(F^(g*(f*x+e)))^n
/a)-1/ln(F)/f/g/n*d^2/a*ln(1+b*(F^(g*(f*x+e)))^n/a)*x^2-2/ln(F)^2
/f^2/g^2/n^2*d^2/a*polylog(2,-b*(F^(g*(f*x+e)))^n/a)*x-1/ln(F)^3/
f^3/g^3/n*d^2*(ln(F^(g*(f*x+e)))-g*(f*x+e)*ln(F))^2/a*ln(a+b*(F^(
g*(f*x+e)))^n)-2/ln(F)^2/f^2/g^2/n^2*c*d/a*polylog(2,-b*(F^(g*(f*
x+e)))^n/a)+1/ln(F)/f^3/g/n*d^2*e^2/a*ln((F^(g*(f*x+e)))^n)-2/3/l
n(F)^3/f^3/g^3*d^2/a*ln(F^(g*(f*x+e)))^3
```

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

$$-c^2\left(\frac{\log\left(\left(F^{fgx+eg}\right)^n b+a\right)}{afgn\log(F)}-\frac{\log\left(\left(F^{fgx+eg}\right)^n\right)}{afgn\log(F)}\right)+\int\frac{d^2x^2+2\,cdx}{\left(F^{fgx}\right)^n(F^{eg})^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x + c)^2/((F^((f*x + e)*g))^n*b + a),x, algorithm="maxima")
```

```
[Out] -c^2*(log((F^(f*g*x + e*g))^n*b + a)/(a*f*g*n*log(F)) - log((F^(f
*g*x + e*g))^n)/(a*f*g*n*log(F))) + integrate((d^2*x^2 + 2*c*d*x)
/((F^(f*g*x))^n*(F^(e*g))^n*b + a), x)
```

Fricas [A] time = 0.265419, size = 366, normalized size = 2.52

$$-\frac{3\left(d^2e^2-2\,cdef+c^2f^2\right)g^2n^2\log\left(F^{fgnx+egn}b+a\right)\log(F)^2-\left(d^2f^3g^3n^3x^3+3\,cdf^3g^3n^3x^2+3\,c^2f^3g^3n^3x\right)\log(F)^3+3\left(d\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x + c)^2/((F^((f*x + e)*g))^n*b + a),x, algorithm="fricas")
```

```
[Out] -1/3*(3*(d^2*e^2 - 2*c*d*e*f + c^2*f^2)*g^2*n^2*log(F^(f*g*n*x +
e*g*n)*b + a)*log(F)^2 - (d^2*f^3*g^3*n^3*x^3 + 3*c*d*f^3*g^3*n^3
*x^2 + 3*c^2*f^3*g^3*n^3*x)*log(F)^3 + 3*(d^2*f^2*g^2*n^2*x^2 + 2
*c*d*f^2*g^2*n^2*x - (d^2*e^2 - 2*c*d*e*f)*g^2*n^2)*log(F)^2*log(
```

```
(F^(f*g*n*x + e*g*n)*b + a)/a) + 6*(d^2*f*g*n*x + c*d*f*g*n)*dilo
g(-(F^(f*g*n*x + e*g*n)*b + a)/a + 1)*log(F) - 6*d^2*polylog(3, -
F^(f*g*n*x + e*g*n)*b/a))/(a*f^3*g^3*n^3*log(F)^3)
```

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

$$\int \frac{(c+dx)^2}{a+b\left(F^{eg}F^{fgx}\right)^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**2/(a+b*(F**(g*(f*x+e)))**n),x)
```

```
[Out] Integral((c + d*x)**2/(a + b*(F**(e*g)*F**(f*g*x))**n), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx+c)^2}{\left(F^{(fx+e)g}\right)^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^2/((F^((f*x + e)*g))^n*b + a),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^2/((F^((f*x + e)*g))^n*b + a), x)
```

3.48 $\int \frac{c+dx}{a+b\left(F^{g(e+fx)}\right)^n}\,dx$

Optimal. Leaf size=98

$$-\frac{d\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{af^2g^2n^2\log^2(F)}-\frac{(c+dx)\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{afgn\log(F)}+\frac{(c+dx)^2}{2ad}$$

```
[Out] (c + d*x)^2/(2*a*d) - ((c + d*x)*Log[1 + (b*(F^(g*(e + f*x)))^n)/
a])/(a*f*g*n*Log[F]) - (d*PolyLog[2, -((b*(F^(g*(e + f*x)))^n)/a)
])/(a*f^2*g^2*n^2*Log[F]^2)
```

Rubi [A] time = 0.256859, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174

$$-\frac{d\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{af^2g^2n^2\log^2(F)}-\frac{(c+dx)\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{afgn\log(F)}+\frac{(c+dx)^2}{2ad}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)/(a + b*(F^(g*(e + f*x)))^n),x]
```

```
[Out] (c + d*x)^2/(2*a*d) - ((c + d*x)*Log[1 + (b*(F^(g*(e + f*x)))^n)/
a])/(a*f*g*n*Log[F]) - (d*PolyLog[2, -((b*(F^(g*(e + f*x)))^n)/a)
])/(a*f^2*g^2*n^2*Log[F]^2)
```

Rubi in Sympy [A] time = 26.6092, size = 66, normalized size = 0.67

$$\frac{d\,\text{Li}_2\left(-\frac{a\left(F^{g(e+fx)}\right)^{-n}}{b}\right)}{af^2g^2n^2\log(F)^2}-\frac{(c+dx)\log\left(\frac{a\left(F^{g(e+fx)}\right)^{-n}}{b}+1\right)}{afgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)/(a+b*(F**(g*(f*x+e)))**n),x)
```

```
[Out] d*polylog(2, -a*(F**(g*(e + f*x)))**(-n)/b)/(a*f**2*g**2*n**2*log
(F)**2) - (c + d*x)*log(a*(F**(g*(e + f*x)))**(-n)/b + 1)/(a*f*g*
```

```
n*log(F))
```

Mathematica [A] time = 89.7332, size = 0, normalized size = 0.

$$\int \frac{c+dx}{a+b\left(F^{g(e+fx)}\right)^n}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(c + d*x)/(a + b*(F^(g*(e + f*x)))^n),x]
```

```
[Out] Integrate[(c + d*x)/(a + b*(F^(g*(e + f*x)))^n), x]
```

Maple [B] time = 0.06, size = 526, normalized size = 5.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)/(a+b*(F^(g*(f*x+e)))^n),x)
```

```
[Out] 1/ln(F)/f/g/n*c/a*ln((F^(g*(f*x+e)))^n)-1/ln(F)/f/g/n*c/a*ln(a+b*
(F^(g*(f*x+e)))^n)+d/a*x^2+1/f*d/a*x*e+1/ln(F)/f/g*d/a*x*(ln(F^(g
*(f*x+e)))-g*(f*x+e)*ln(F))-1/ln(F)/f/g*d/a*ln(F^(g*(f*x+e)))*x+1
/2/ln(F)^2/f^2/g^2*d/a*ln(F^(g*(f*x+e)))^2-1/ln(F)/f/g/n*d/a*ln(1
+b*(F^(g*(f*x+e)))^n/a)*x-1/ln(F)/f^2/g/n*d/a*ln(1+b*(F^(g*(f*x+e
)))^n/a)*e-1/ln(F)^2/f^2/g^2/n*d/a*ln(1+b*(F^(g*(f*x+e)))^n/a)*(l
n(F^(g*(f*x+e)))-g*(f*x+e)*ln(F))-d*polylog(2,-b*(F^(g*(f*x+e)))^
n/a)/a/f^2/g^2/n^2/ln(F)^2-1/ln(F)/f^2/g/n*d*e/a*ln((F^(g*(f*x+e)
))^n)+1/ln(F)/f^2/g/n*d*e/a*ln(a+b*(F^(g*(f*x+e)))^n)-1/ln(F)^2/f
^2/g^2/n*d*(ln(F^(g*(f*x+e)))-g*(f*x+e)*ln(F))/a*ln((F^(g*(f*x+e)
))^n)+1/ln(F)^2/f^2/g^2/n*d*(ln(F^(g*(f*x+e)))-g*(f*x+e)*ln(F))/a
*ln(a+b*(F^(g*(f*x+e)))^n)
```

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

$$-c\left(\frac{\log\left(\left(F^{fgx+eg}\right)^n b+a\right)}{afgn\log\left(F\right)}-\frac{\log\left(\left(F^{fgx+eg}\right)^n\right)}{afgn\log\left(F\right)}\right)+d\int\frac{x}{\left(F^{fgx}\right)^n\left(F^{eg}\right)^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x + c)/((F^((f*x + e)*g))^n*b + a),x, algorithm="maxima")
```

```
[Out] -c*(log((F^(f*g*x + e*g))^n*b + a)/(a*f*g*n*log(F)) - log((F^(f*g
*x + e*g))^n)/(a*f*g*n*log(F))) + d*integrate(x/((F^(f*g*x))^n*(F
^(e*g))^n*b + a), x)
```

Fricas [A] time = 0.266359, size = 198, normalized size = 2.02

$$\frac{2\,(de-cf)gn\log\left(F^{fgnx+egn}b+a\right)\log\left(F\right)+\left(df^2g^2n^2x^2+2\,cf^2g^2n^2x\right)\log\left(F\right)^2-2\,(dfgnx+degn)\log\left(F\right)\log\left(\frac{F^{fgnx+egn}b+}{a}\right.}{2\,af^2g^2n^2\log\left(F\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x + c)/((F^((f*x + e)*g))^n*b + a),x, algorithm="fricas")
```

```
[Out] 1/2*(2*(d*e - c*f)*g*n*log(F^(f*g*n*x + e*g*n)*b + a)*log(F) + (d
*f^2*g^2*n^2*x^2 + 2*c*f^2*g^2*n^2*x)*log(F)^2 - 2*(d*f*g*n*x + d
*e*g*n)*log(F)*log((F^(f*g*n*x + e*g*n)*b + a)/a) - 2*d*dilog(-(F
^(f*g*n*x + e*g*n)*b + a)/a + 1))/(a*f^2*g^2*n^2*log(F)^2)
```

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

$$\int \frac{c+dx}{a+b\left(F^{eg}F^{fgx}\right)^{n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)/(a+b*(F**(g*(f*x+e)))**n),x)
```

```
[Out] Integral((c + d*x)/(a + b*(F**(e*g)*F**(f*g*x))**n), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{dx+c}{\left(F^{(fx+e)g}\right)^{n}b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x + c)/((F^((f*x + e)*g))^n*b + a),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)/((F^((f*x + e)*g))^n*b + a), x)
```

3.49 $\int \frac{1}{a+b\left(F^{g(e+fx)}\right)^n}\,dx$

Optimal. Leaf size=40

$$\frac{x}{a}-\frac{\log\left(a+b\left(F^{g(e+fx)}\right)^n\right)}{afgn\log(F)}$$

```
[Out] x/a - Log[a + b*(F^(g*(e + f*x)))^n]/(a*f*g*n*Log[F])
```

Rubi [A] time = 0.0641019, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294

$$\frac{x}{a}-\frac{\log\left(a+b\left(F^{g(e+fx)}\right)^n\right)}{afgn\log(F)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)^(-1),x]
```

```
[Out] x/a - Log[a + b*(F^(g*(e + f*x)))^n]/(a*f*g*n*Log[F])
```

Rubi in Sympy [A] time = 13.0804, size = 46, normalized size = 1.15

$$-\frac{\log\left(a+b\left(F^{g(e+fx)}\right)^n\right)}{afgn\log(F)}+\frac{\log\left(\left(F^{g(e+fx)}\right)^n\right)}{afgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*(F**(g*(f*x+e)))**n),x)
```

```
[Out] -log(a + b*(F**(g*(e + f*x)))**n)/(a*f*g*n*log(F)) + log((F**(g*(
e + f*x)))**n)/(a*f*g*n*log(F))
```

Mathematica [B] time = 0.0174381, size = 100, normalized size = 2.5

$$\frac{x}{a}-\frac{\log\left(a+be^{n\left(\log\left(F^{eg+fgx}\right)-fgx\log(F)\right)}\left(F^{eg+fgx}\right)^{n-\frac{n\left(\log\left(F^{eg+fgx}\right)-fgx\log(F)\right)}{\log\left(F^{eg+fgx}\right)}}\right)}{afgn\log(F)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)^(-1),x]
```

```
[Out] x/a - Log[a + b*E^(n*(-(f*g*x*Log[F]) + Log[F^(e*g + f*g*x)]))*(F
^(e*g + f*g*x))^(n - (n*(-(f*g*x*Log[F]) + Log[F^(e*g + f*g*x)]))
/Log[F^(e*g + f*g*x)])]/(a*f*g*n*Log[F])
```

Maple [A]   time = 0.004, size = 65, normalized size = 1.6

$$\frac{\ln\left(\left(F^{g(fx+e)}\right)^{n}\right)}{\ln(F)\,afgn}-\frac{\ln\left(a+b\left(F^{g(fx+e)}\right)^{n}\right)}{\ln(F)\,afgn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*(F^(g*(f*x+e)))^n),x)
```

```
[Out] 1/g/f/ln(F)/n/a*ln((F^(g*(f*x+e)))^n)-ln(a+b*(F^(g*(f*x+e)))^n)/a
/f/g/n/ln(F)
```

Maxima [A]   time = 0.88007, size = 89, normalized size = 2.22

$$-\frac{\log\left(\left(F^{fgx+eg}\right)^{n}b+a\right)}{afgn\log(F)}+\frac{\log\left(\left(F^{fgx+eg}\right)^{n}\right)}{afgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((F^((f*x + e)*g))^n*b + a),x, algorithm="maxima")
```

```
[Out] -log((F^(f*g*x + e*g))^n*b + a)/(a*f*g*n*log(F)) + log((F^(f*g*x
+ e*g))^n)/(a*f*g*n*log(F))
```

Fricas [A]   time = 0.264101, size = 59, normalized size = 1.48

$$\frac{fgnx\log(F)-\log\left(F^{fgnx+egn}b+a\right)}{afgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((F^((f*x + e)*g))^n*b + a),x, algorithm="fricas")
```

```
[Out] (f*g*n*x*log(F) - log(F^(f*g*n*x + e*g*n)*b + a))/(a*f*g*n*log(F)
)
```

Sympy [A] time = 0.347616, size = 27, normalized size = 0.68

$$\frac{x}{a} - \frac{\log\left(\frac{a}{b} + \left(F^{g(e+fx)}\right)^{n}\right)}{afgn\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*(F**(g*(f*x+e)))**n),x)
```

```
[Out] x/a - log(a/b + (F**(g*(e + f*x)))**n)/(a*f*g*n*log(F))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(F^{(fx+e)g}\right)^{n}b + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((F^((f*x + e)*g))^n*b + a),x, algorithm="giac")
```

```
[Out] integrate(1/((F^((f*x + e)*g))^n*b + a), x)
```

3.50 $\int \frac{1}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)(c+dx)}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{1}{(c+dx)\left(a+b\left(F^{eg+fgx}\right)^n\right)},x\right)$$

```
[Out] Unintegrable[1/((a + b*(F^(e*g + f*g*x))^n)*(c + d*x)), x]
```

Rubi [A] time = 0.205401, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$

$$\text{Int}\left(\frac{1}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)(c+dx)},x\right)$$

Verification is Not applicable to the result.

```
[In]  Int[1/((a + b*(F^(g*(e + f*x)))^n)*(c + d*x)),x]

[Out] Defer[Int][1/((a + b*(F^(e*g + f*g*x))^n)*(c + d*x)), x]
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*(F**(g*(f*x+e)))**n)/(d*x+c),x)

[Out] Timed out
```

Mathematica [A] time = 0.117535, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)(c+dx)}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[1/((a + b*(F^(g*(e + f*x)))^n)*(c + d*x)),x]

[Out] Integrate[1/((a + b*(F^(g*(e + f*x)))^n)*(c + d*x)), x]
```

Maple [A] time = 0.116, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\left(F^{g(fx+e)}\right)^{n}\right)(dx+c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*(F^(g*(f*x+e)))^n)/(d*x+c),x)

[Out] int(1/(a+b*(F^(g*(f*x+e)))^n)/(d*x+c),x)
```

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

$$\int \frac{1}{\left(\left(F^{(fx+e)g}\right)^{n}b+a\right)(dx+c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((F^((f*x + e)*g))^n*b + a)*(d*x + c)),x, algorithm="maxima")

[Out] integrate(1/(((F^((f*x + e)*g))^n*b + a)*(d*x + c)), x)
```

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

$$\mathrm{integral}\left(\frac{1}{adx+(bdx+bc)\left(F^{fgx+eg}\right)^{n}+ac},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((F^((f*x + e)*g))^n*b + a)*(d*x + c)),x, algorithm="fricas")

[Out] integral(1/(a*d*x + (b*d*x + b*c)*(F^(f*g*x + e*g))^n + a*c), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*(F**(g*(f*x+e)))**n)/(d*x+c),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(\left(F^{(fx+e)g}\right)^n b + a\right)(dx + c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((F^((f*x + e)*g))^n*b + a)*(d*x + c)),x, algorithm="giac")
```

```
[Out] integrate(1/(((F^((f*x + e)*g))^n*b + a)*(d*x + c)), x)
```

3.51 $\int \frac{1}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)(c+dx)^2}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{1}{(c+dx)^2\left(a+b\left(F^{eg+fgx}\right)^n\right)},x\right)$$

```
[Out] Unintegrable[1/((a + b*(F^(e*g + f*g*x))^n)*(c + d*x)^2), x]
```

Rubi [A] time = 0.184788, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$

$$\text{Int}\left(\frac{1}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)(c+dx)^2},x\right)$$

Verification is Not applicable to the result.

```
[In]  Int[1/((a + b*(F^(g*(e + f*x)))^n)*(c + d*x)^2),x]

[Out] Defer[Int][1/((a + b*(F^(e*g + f*g*x))^n)*(c + d*x)^2), x]
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*(F**(g*(f*x+e)))**n)/(d*x+c)**2,x)

[Out] Timed out
```

Mathematica [A] time = 0.461133, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)(c+dx)^2}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[1/((a + b*(F^(g*(e + f*x)))^n)*(c + d*x)^2),x]
```

```
[Out] Integrate[1/((a + b*(F^(g*(e + f*x)))^n)*(c + d*x)^2), x]
```

Maple [A] time = 0.135, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\left(F^{g(fx+e)}\right)^{n}\right)(dx+c)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*(F^(g*(f*x+e)))^n)/(d*x+c)^2,x)
```

```
[Out] int(1/(a+b*(F^(g*(f*x+e)))^n)/(d*x+c)^2,x)
```

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

$$\int \frac{1}{\left(\left(F^{(fx+e)g}\right)^{n}b+a\right)(dx+c)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((F^((f*x + e)*g))^n*b + a)*(d*x + c)^2),x, algorithm="maxima")
```

```
[Out] integrate(1/(((F^((f*x + e)*g))^n*b + a)*(d*x + c)^2), x)
```

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

$$\text{integral}\left(\frac{1}{ad^{2}x^{2}+2\,acdx+ac^{2}+(bd^{2}x^{2}+2\,bcdx+bc^{2})\left(F^{fgx+eg}\right)^{n}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((F^((f*x + e)*g))^n*b + a)*(d*x + c)^2),x, algorithm="fricas")
```

```
[Out] integral(1/(a*d^2*x^2 + 2*a*c*d*x + a*c^2 + (b*d^2*x^2 + 2*b*c*d*
x + b*c^2)*(F^(f*g*x + e*g))^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*(F**(g*(f*x+e)))**n)/(d*x+c)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(\left(F^{(fx+e)g}\right)^{n} b + a\right)(dx + c)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((F^((f*x + e)*g))^n*b + a)*(d*x + c)^2),x, algorithm="giac")
```

```
[Out] integrate(1/(((F^((f*x + e)*g))^n*b + a)*(d*x + c)^2), x)
```

3.52 $\int \frac{(c+dx)^3}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2}\,dx$

Optimal. Leaf size=388

$$\frac{6d^2(c+dx)\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^2f^3g^3n^3\log^3(F)}+\frac{6d^2(c+dx)\text{PolyLog}\left(3,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^2f^3g^3n^3\log^3(F)}-\frac{3d(c+dx)^2\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^2f^2g^2n^2\log^2(F)}-\frac{6d^3\text{PolyLog}\left(3,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^2f^4g^4n^4\log^4(F)}-\frac{6d^3\text{PolyLog}\left(4,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^2f^4g^4n^4\log^4(F)}+\frac{3d(c+dx)^2\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{a^2f^2g^2n^2\log^2(F)}-\frac{(c+dx)^3\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{a^2fgn\log(F)}-\frac{(c+dx)^3}{a^2fgn\log(F)}+\frac{(c+dx)^4}{4a^2d}+\frac{(c+dx)^3}{afgn\log(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)}$$

```
[Out] (c + d*x)^4/(4*a^2*d) - (c + d*x)^3/(a^2*f*g*n*Log[F]) + (c + d*x
)^3/(a*f*(a + b*(F^(g*(e + f*x)))^n)*g*n*Log[F]) + (3*d*(c + d*x)
^2*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(a^2*f^2*g^2*n^2*Log[F]^2)
 - ((c + d*x)^3*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(a^2*f*g*n*Lo
g[F]) + (6*d^2*(c + d*x)*PolyLog[2, -((b*(F^(g*(e + f*x)))^n)/a)]
)/(a^2*f^3*g^3*n^3*Log[F]^3) - (3*d*(c + d*x)^2*PolyLog[2, -((b*(
F^(g*(e + f*x)))^n)/a)])/(a^2*f^2*g^2*n^2*Log[F]^2) - (6*d^3*Poly
Log[3, -((b*(F^(g*(e + f*x)))^n)/a)])/(a^2*f^4*g^4*n^4*Log[F]^4)
+ (6*d^2*(c + d*x)*PolyLog[3, -((b*(F^(g*(e + f*x)))^n)/a)])/(a^2
*f^3*g^3*n^3*Log[F]^3) - (6*d^3*PolyLog[4, -((b*(F^(g*(e + f*x)))
^n)/a)])/(a^2*f^4*g^4*n^4*Log[F]^4)
```

Rubi [A] time = 1.42057, antiderivative size = 388, normalized size of antiderivative = 1., number of

steps used = 13, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.32$

$$\frac{6d^2(c+dx)\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^2f^3g^3n^3\log^3(F)}+\frac{6d^2(c+dx)\text{PolyLog}\left(3,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^2f^3g^3n^3\log^3(F)}-\frac{3d(c+dx)^2\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^2f^2g^2n^2\log^2(F)}-\frac{6d^3\text{PolyLog}\left(3,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^2f^4g^4n^4\log^4(F)}-\frac{6d^3\text{PolyLog}\left(4,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^2f^4g^4n^4\log^4(F)}+\frac{3d(c+dx)^2\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{a^2f^2g^2n^2\log^2(F)}-\frac{(c+dx)^3\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{a^2fgn\log(F)}-\frac{(c+dx)^3}{a^2fgn\log(F)}+\frac{(c+dx)^4}{4a^2d}+\frac{(c+dx)^3}{afgn\log(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^3/(a + b*(F^(g*(e + f*x))))^n)^2,x]
```

```
[Out] (c + d*x)^4/(4*a^2*d) - (c + d*x)^3/(a^2*f*g*n*Log[F]) + (c + d*x
)^3/(a*f*(a + b*(F^(g*(e + f*x))))^n)*g*n*Log[F]) + (3*d*(c + d*x)
^2*Log[1 + (b*(F^(g*(e + f*x))))^n)/a])/(a^2*f^2*g^2*n^2*Log[F]^2)
 - ((c + d*x)^3*Log[1 + (b*(F^(g*(e + f*x))))^n)/a])/(a^2*f*g*n*Lo
g[F]) + (6*d^2*(c + d*x)*PolyLog[2, -((b*(F^(g*(e + f*x))))^n)/a)]
)/(a^2*f^3*g^3*n^3*Log[F]^3) - (3*d*(c + d*x)^2*PolyLog[2, -((b*(
F^(g*(e + f*x))))^n)/a)])/(a^2*f^2*g^2*n^2*Log[F]^2) - (6*d^3*Poly
Log[3, -((b*(F^(g*(e + f*x))))^n)/a)])/(a^2*f^4*g^4*n^4*Log[F]^4)
+ (6*d^2*(c + d*x)*PolyLog[3, -((b*(F^(g*(e + f*x))))^n)/a)])/(a^2
*f^3*g^3*n^3*Log[F]^3) - (6*d^3*PolyLog[4, -((b*(F^(g*(e + f*x))))
^n)/a)])/(a^2*f^4*g^4*n^4*Log[F]^4)
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**3/(a+b*(F**(g*(f*x+e)))**n)**2,x)
```

```
[Out] Timed out
```

Mathematica [A] time = 3.57524, size = 0, normalized size = 0.

$$\int \frac{(c+dx)^3}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(c + d*x)^3/(a + b*(F^(g*(e + f*x)))^n)^2,x]

[Out] Integrate[(c + d*x)^3/(a + b*(F^(g*(e + f*x)))^n)^2, x]
```

Maple [B] time = 0.072, size = 2553, normalized size = 6.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^3/(a+b*(F^(g*(f*x+e)))^n)^2,x)

[Out] 6/n^3/g^3/f^3/ln(F)^3/a^2*d^3*polylog(2,-b*(F^(g*(f*x+e)))^n/a)*x
+6/n^3/g^3/f^3/ln(F)^3/a^2*d^3*polylog(3,-b*(F^(g*(f*x+e)))^n/a)*
x+6/n^3/g^3/f^3/ln(F)^3/a^2*c*d^2*polylog(3,-b*(F^(g*(f*x+e)))^n/
a)+6/n^3/g^3/f^3/ln(F)^3/a^2*c*d^2*polylog(2,-b*(F^(g*(f*x+e)))^n
/a)-3/n^2/g^2/f^2/ln(F)^2/a^2*d^3*polylog(2,-b*(F^(g*(f*x+e)))^n/
a)*x^2-3/n^2/g^4/f^4/ln(F)^4/a^2*d^3*ln(1+b*(F^(g*(f*x+e)))^n/a)*
ln(F^(g*(f*x+e)))^2+3/g^2/f^2/ln(F)^2/a^2*c*d^2*ln(F^(g*(f*x+e)))
^2*x-1/n/g/f/ln(F)/a^2*d^3*ln(a+b*(F^(g*(f*x+e)))^n)*x^3+1/n/g^4/
f^4/ln(F)^4/a^2*d^3*ln(a+b*(F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)))^3
+1/n/g/f/ln(F)/a^2*d^3*ln((F^(g*(f*x+e)))^n)*x^3-1/n/g^4/f^4/ln(F
)^4/a^2*d^3*ln((F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)))^3-1/n/g^4/f^4
/ln(F)^4/a^2*d^3*ln(1+b*(F^(g*(f*x+e)))^n/a)*ln(F^(g*(f*x+e)))^3-
3/n/g^3/f^3/ln(F)^3/a^2*c*d^2*ln(F^(g*(f*x+e)))^2-3/n/g^3/f^3/ln(
F)^3/a^2*d^3*ln(F^(g*(f*x+e)))^2*x-3/n^2/g^2/f^2/ln(F)^2/a^2*d^3*
ln((F^(g*(f*x+e)))^n)*x^2-3/n^2/g^4/f^4/ln(F)^4/a^2*d^3*ln((F^(g*
(f*x+e)))^n)*ln(F^(g*(f*x+e)))^2+3/n^2/g^2/f^2/ln(F)^2/a^2*d^3*ln
(a+b*(F^(g*(f*x+e)))^n)*x^2+3/n^2/g^4/f^4/ln(F)^4/a^2*d^3*ln(a+b*
(F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)))^2-3/n^2/g^2/f^2/ln(F)^2/a^2*
c^2*d*polylog(2,-b*(F^(g*(f*x+e)))^n/a)-3/n^2/g^2/f^2/ln(F)^2/a^2
*c^2*d*ln((F^(g*(f*x+e)))^n)+3/n^2/g^2/f^2/ln(F)^2/a^2*c^2*d*ln(a
+b*(F^(g*(f*x+e)))^n)-6*d^3*polylog(3,-b*(F^(g*(f*x+e)))^n/a)/a^2
/f^4/g^4/n^4/ln(F)^4-6*d^3*polylog(4,-b*(F^(g*(f*x+e)))^n/a)/a^2/
f^4/g^4/n^4/ln(F)^4-3/n/g^2/f^2/ln(F)^2/a^2*c^2*d*ln(1+b*(F^(g*(f
*x+e)))^n/a)*ln(F^(g*(f*x+e)))-6/n^2/g^2/f^2/ln(F)^2/a^2*c*d^2*po
lylog(2,-b*(F^(g*(f*x+e)))^n/a)*x+3/n/g^3/f^3/ln(F)^3/a^2*c*d^2*l
n(1+b*(F^(g*(f*x+e)))^n/a)*ln(F^(g*(f*x+e)))^2+6/n^2/g^3/f^3/ln(F
)^3/a^2*d^3*ln((F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)))*x-6/n^2/g^3/f
^3/ln(F)^3/a^2*d^3*ln(a+b*(F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)))*x+
```

```
6/n^2/g^3/f^3/ln(F)^3/a^2*d^3*ln(1+b*(F^(g*(f*x+e)))^n/a)*ln(F^(g
*(f*x+e)))*x-6/n^2/g^2/f^2/ln(F)^2/a^2*c*d^2*ln((F^(g*(f*x+e)))^n
)*x+6/n^2/g^3/f^3/ln(F)^3/a^2*c*d^2*ln((F^(g*(f*x+e)))^n)*ln(F^(g
*(f*x+e)))+6/n^2/g^2/f^2/ln(F)^2/a^2*c*d^2*ln(a+b*(F^(g*(f*x+e)))
^n)*x-6/n^2/g^3/f^3/ln(F)^3/a^2*c*d^2*ln(a+b*(F^(g*(f*x+e)))^n)*l
n(F^(g*(f*x+e)))+6/n^2/g^3/f^3/ln(F)^3/a^2*c*d^2*ln(1+b*(F^(g*(f*
x+e)))^n/a)*ln(F^(g*(f*x+e)))+3/n/g^2/f^2/ln(F)^2/a^2*d^3*ln(a+b*
(F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)))*x^2-3/n/g^3/f^3/ln(F)^3/a^2*
d^3*ln(a+b*(F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)))^2*x-3/n/g^2/f^2/l
n(F)^2/a^2*d^3*ln((F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)))*x^2+3/n/g^
3/f^3/ln(F)^3/a^2*d^3*ln((F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)))^2*x
-3/n/g^2/f^2/ln(F)^2/a^2*d^3*ln(1+b*(F^(g*(f*x+e)))^n/a)*ln(F^(g*
(f*x+e)))*x^2+3/n/g^3/f^3/ln(F)^3/a^2*d^3*ln(1+b*(F^(g*(f*x+e)))^
n/a)*ln(F^(g*(f*x+e)))^2*x+3/n/g/f/ln(F)/a^2*c*d^2*ln((F^(g*(f*x+
e)))^n)*x^2+3/n/g^3/f^3/ln(F)^3/a^2*c*d^2*ln((F^(g*(f*x+e)))^n)*l
n(F^(g*(f*x+e)))^2-3/n/g/f/ln(F)/a^2*c*d^2*ln(a+b*(F^(g*(f*x+e)))
^n)*x^2-3/n/g^3/f^3/ln(F)^3/a^2*c*d^2*ln(a+b*(F^(g*(f*x+e)))^n)*l
n(F^(g*(f*x+e)))^2+3/n/g/f/ln(F)/a^2*c^2*d*ln((F^(g*(f*x+e)))^n)*
x-3/n/g^2/f^2/ln(F)^2/a^2*c^2*d*ln((F^(g*(f*x+e)))^n)*ln(F^(g*(f*
x+e)))-2/g^3/f^3/ln(F)^3/a^2*c*d^2*ln(F^(g*(f*x+e)))^3+2/n/g^4/f^
4/ln(F)^4/a^2*d^3*ln(F^(g*(f*x+e)))^3+1/n/g/f/ln(F)/a^2*c^3*ln((F
^(g*(f*x+e)))^n)-1/n/g/f/ln(F)/a^2*c^3*ln(a+b*(F^(g*(f*x+e)))^n)+
3/2/g^2/f^2/ln(F)^2/a^2*c^2*d*ln(F^(g*(f*x+e)))^2+3/2/g^2/f^2/ln(
F)^2/a^2*d^3*ln(F^(g*(f*x+e)))^2*x^2-2/g^3/f^3/ln(F)^3/a^2*d^3*ln
(F^(g*(f*x+e)))^3*x+1/n/g/f/ln(F)/a*(d^3*x^3+3*c*d^2*x^2+3*c^2*d*
x+c^3)/(a+b*(F^(g*(f*x+e)))^n)+3/4/g^4/f^4/ln(F)^4/a^2*d^3*ln(F^(
g*(f*x+e)))^4-3/n/g/f/ln(F)/a^2*c^2*d*ln(a+b*(F^(g*(f*x+e)))^n)*x
+3/n/g^2/f^2/ln(F)^2/a^2*c^2*d*ln(a+b*(F^(g*(f*x+e)))^n)*ln(F^(g*
(f*x+e)))-6/n/g^2/f^2/ln(F)^2/a^2*c*d^2*ln((F^(g*(f*x+e)))^n)*ln(
F^(g*(f*x+e)))*x+6/n/g^2/f^2/ln(F)^2/a^2*c*d^2*ln(a+b*(F^(g*(f*x+
e)))^n)*ln(F^(g*(f*x+e)))*x-6/n/g^2/f^2/ln(F)^2/a^2*c*d^2*ln(1+b*
(F^(g*(f*x+e)))^n/a)*ln(F^(g*(f*x+e)))*x
```

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

$$c^{3}\left(\frac{1}{\left(\left(F^{fgx+eg}\right)^{n}abn+a^{2}n\right)fg\log\left(F\right)}+\frac{\log\left(F^{fgx+eg}\right)}{a^{2}fg\log\left(F\right)}-\frac{\log\left(\frac{\left(F^{fgx+eg}\right)^{n}b+a}{b}\right)}{a^{2}fgn\log\left(F\right)}\right)$$
$$+\frac{d^{3}x^{3}+3\,cd^{2}x^{2}+3\,c^{2}dx}{\left(F^{fgx}\right)^{n}\left(F^{eg}\right)^{n}abfgn\log\left(F\right)+a^{2}fgn\log\left(F\right)}$$
$$+\int\frac{d^{3}fgnx^{3}\log\left(F\right)-3\,c^{2}d+3\left(cd^{2}fgn\log\left(F\right)-d^{3}\right)x^{2}+3\left(c^{2}dfgn\log\left(F\right)-2\,cd^{2}\right)x}{\left(F^{fgx}\right)^{n}\left(F^{eg}\right)^{n}abfgn\log\left(F\right)+a^{2}fgn\log\left(F\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x + c)^3/((F^((f*x + e)*g))^n*b + a)^2,x, algorithm="maxima")
```

```
[Out] c^3*(1/(((F^(f*g*x + e*g))^n*a*b*n + a^2*n)*f*g*log(F)) + log(F^(
f*g*x + e*g))/(a^2*f*g*log(F)) - log(((F^(f*g*x + e*g))^n*b + a)/
b)/(a^2*f*g*n*log(F))) + (d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x)/((F^
(f*g*x))^n*(F^(e*g))^n*a*b*f*g*n*log(F) + a^2*f*g*n*log(F)) + int
egrate((d^3*f*g*n*x^3*log(F) - 3*c^2*d + 3*(c*d^2*f*g*n*log(F) -
d^3)*x^2 + 3*(c^2*d*f*g*n*log(F) - 2*c*d^2)*x)/((F^(f*g*x))^n*(F^
(e*g))^n*a*b*f*g*n*log(F) + a^2*f*g*n*log(F)), x)
```

Fricas [A] time = 0.291846, size = 1877, normalized size = 4.84

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x + c)^3/((F^((f*x + e)*g))^n*b + a)^2,x, algorithm="fricas")
```

```
[Out] -1/4*(4*(a*d^3*e^3 - 3*a*c*d^2*e^2*f + 3*a*c^2*d*e*f^2 - a*c^3*f^
3)*g^3*n^3*log(F)^3 - (a*d^3*f^4*g^4*n^4*x^4 + 4*a*c*d^2*f^4*g^4*
n^4*x^3 + 6*a*c^2*d*f^4*g^4*n^4*x^2 + 4*a*c^3*f^4*g^4*n^4*x - (a*
d^3*e^4 - 4*a*c*d^2*e^3*f + 6*a*c^2*d*e^2*f^2 - 4*a*c^3*e*f^3)*g^
4*n^4)*log(F)^4 - ((b*d^3*f^4*g^4*n^4*x^4 + 4*b*c*d^2*f^4*g^4*n^4
*x^3 + 6*b*c^2*d*f^4*g^4*n^4*x^2 + 4*b*c^3*f^4*g^4*n^4*x - (b*d^3
*e^4 - 4*b*c*d^2*e^3*f + 6*b*c^2*d*e^2*f^2 - 4*b*c^3*e*f^3)*g^4*n
^4)*log(F)^4 - 4*(b*d^3*f^3*g^3*n^3*x^3 + 3*b*c*d^2*f^3*g^3*n^3*x
^2 + 3*b*c^2*d*f^3*g^3*n^3*x + (b*d^3*e^3 - 3*b*c*d^2*e^2*f + 3*b
*c^2*d*e*f^2)*g^3*n^3)*log(F)^3)*F^(f*g*n*x + e*g*n) + 12*((a*d^3
*f^2*g^2*n^2*x^2 + 2*a*c*d^2*f^2*g^2*n^2*x + a*c^2*d*f^2*g^2*n^2)
*log(F)^2 + ((b*d^3*f^2*g^2*n^2*x^2 + 2*b*c*d^2*f^2*g^2*n^2*x + b
*c^2*d*f^2*g^2*n^2)*log(F)^2 - 2*(b*d^3*f*g*n*x + b*c*d^2*f*g*n)*
log(F))*F^(f*g*n*x + e*g*n) - 2*(a*d^3*f*g*n*x + a*c*d^2*f*g*n)*l
og(F))*dilog(-(F^(f*g*n*x + e*g*n)*b + a)/a + 1) - 4*((a*d^3*e^3
- 3*a*c*d^2*e^2*f + 3*a*c^2*d*e*f^2 - a*c^3*f^3)*g^3*n^3*log(F)^3
 + 3*(a*d^3*e^2 - 2*a*c*d^2*e*f + a*c^2*d*f^2)*g^2*n^2*log(F)^2 +
 ((b*d^3*e^3 - 3*b*c*d^2*e^2*f + 3*b*c^2*d*e*f^2 - b*c^3*f^3)*g^3
*n^3*log(F)^3 + 3*(b*d^3*e^2 - 2*b*c*d^2*e*f + b*c^2*d*f^2)*g^2*n
^2*log(F)^2)*F^(f*g*n*x + e*g*n))*log(F^(f*g*n*x + e*g*n)*b + a)
+ 4*((a*d^3*f^3*g^3*n^3*x^3 + 3*a*c*d^2*f^3*g^3*n^3*x^2 + 3*a*c^2
*d*f^3*g^3*n^3*x + (a*d^3*e^3 - 3*a*c*d^2*e^2*f + 3*a*c^2*d*e*f^2
)*g^3*n^3)*log(F)^3 - 3*(a*d^3*f^2*g^2*n^2*x^2 + 2*a*c*d^2*f^2*g^
2*n^2*x - (a*d^3*e^2 - 2*a*c*d^2*e*f)*g^2*n^2)*log(F)^2 + ((b*d^3
*f^3*g^3*n^3*x^3 + 3*b*c*d^2*f^3*g^3*n^3*x^2 + 3*b*c^2*d*f^3*g^3*
n^3*x + (b*d^3*e^3 - 3*b*c*d^2*e^2*f + 3*b*c^2*d*e*f^2)*g^3*n^3)*
log(F)^3 - 3*(b*d^3*f^2*g^2*n^2*x^2 + 2*b*c*d^2*f^2*g^2*n^2*x - (
b*d^3*e^2 - 2*b*c*d^2*e*f)*g^2*n^2)*log(F)^2)*F^(f*g*n*x + e*g*n)
)*log((F^(f*g*n*x + e*g*n)*b + a)/a) + 24*(F^(f*g*n*x + e*g*n)*b*
d^3 + a*d^3)*polylog(4, -F^(f*g*n*x + e*g*n)*b/a) + 24*(a*d^3 + (
b*d^3 - (b*d^3*f*g*n*x + b*c*d^2*f*g*n)*log(F))*F^(f*g*n*x + e*g*
n) - (a*d^3*f*g*n*x + a*c*d^2*f*g*n)*log(F))*polylog(3, -F^(f*g*n
```

```
*x + e*g*n)*b/a))/(F^(f*g*n*x + e*g*n)*a^2*b*f^4*g^4*n^4*log(F)^4
 + a^3*f^4*g^4*n^4*log(F)^4)
```

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

$$\frac{c^3+3c^2dx+3cd^2x^2+d^3x^3}{a^2fgn\log(F)+abfgn\left(F^{g(e+fx)}\right)^n\log(F)} + \frac{\int\left(-\frac{3c^2d}{a+be^{egn\log(F)}e^{fgnx\log(F)}}\right)dx+\int\left(-\frac{3d^3x^2}{a+be^{egn\log(F)}e^{fgnx\log(F)}}\right)dx+\int\left(-\frac{6cd^2x}{a+be^{egn\log(F)}e^{fgnx\log(F)}}\right)dx+\int\frac{c^3fgn\log(F)}{a+be^{egn\log(F)}e^{fgnx\log(F)}}}{afgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**3/(a+b*(F**(g*(f*x+e)))**n)**2,x)
```

```
[Out] (c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3)/(a**2*f*g*n*log(F
) + a*b*f*g*n*(F**(g*(e + f*x)))**n*log(F)) + (Integral(-3*c**2*d
/(a + b*exp(e*g*n*log(F))*exp(f*g*n*x*log(F))), x) + Integral(-3*
d**3*x**2/(a + b*exp(e*g*n*log(F))*exp(f*g*n*x*log(F))), x) + Int
egral(-6*c*d**2*x/(a + b*exp(e*g*n*log(F))*exp(f*g*n*x*log(F))),
x) + Integral(c**3*f*g*n*log(F)/(a + b*exp(e*g*n*log(F))*exp(f*g*
n*x*log(F))), x) + Integral(d**3*f*g*n*x**3*log(F)/(a + b*exp(e*g
*n*log(F))*exp(f*g*n*x*log(F))), x) + Integral(3*c*d**2*f*g*n*x**
2*log(F)/(a + b*exp(e*g*n*log(F))*exp(f*g*n*x*log(F))), x) + Inte
gral(3*c**2*d*f*g*n*x*log(F)/(a + b*exp(e*g*n*log(F))*exp(f*g*n*x
*log(F))), x))/(a*f*g*n*log(F))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(dx+c)^3}{\left(\left(F^{(fx+e)g}\right)^nb+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x + c)^3/((F^((f*x + e)*g))^n*b + a)^2,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^3/((F^((f*x + e)*g))^n*b + a)^2, x)
```

3.53 $\int \frac{(c+dx)^2}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2} \, dx$

Optimal. Leaf size=294

$$-\frac{2d(c+dx)\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^2f^2g^2n^2\log^2(F)}+\frac{2d^2\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^2f^3g^3n^3\log^3(F)}+\frac{2d^2\text{PolyLog}\left(3,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^2f^3g^3n^3\log^3(F)}+\frac{2d(c+dx)\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{a^2f^2g^2n^2\log^2(F)}-\frac{(c+dx)^2\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{a^2fgn\log(F)}-\frac{(c+dx)^2}{a^2fgn\log(F)}+\frac{(c+dx)^3}{3a^2d}+\frac{(c+dx)^2}{afgn\log(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)}$$

```
[Out] (c + d*x)^3/(3*a^2*d) - (c + d*x)^2/(a^2*f*g*n*Log[F]) + (c + d*x
)^2/(a*f*(a + b*(F^(g*(e + f*x)))^n)*g*n*Log[F]) + (2*d*(c + d*x)
*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(a^2*f^2*g^2*n^2*Log[F]^2) -
 ((c + d*x)^2*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(a^2*f*g*n*Log[
F]) + (2*d^2*PolyLog[2, -((b*(F^(g*(e + f*x)))^n)/a)])/(a^2*f^3*g
^3*n^3*Log[F]^3) - (2*d*(c + d*x)*PolyLog[2, -((b*(F^(g*(e + f*x)
))^n)/a)])/(a^2*f^2*g^2*n^2*Log[F]^2) + (2*d^2*PolyLog[3, -((b*(F
^(g*(e + f*x)))^n)/a)])/(a^2*f^3*g^3*n^3*Log[F]^3)
```

Rubi [A] time = 1.11815, antiderivative size = 294, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.36

$$-\frac{2d(c+dx)\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^2f^2g^2n^2\log^2(F)}+\frac{2d^2\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^2f^3g^3n^3\log^3(F)}+\frac{2d^2\text{PolyLog}\left(3,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^2f^3g^3n^3\log^3(F)}+\frac{2d(c+dx)\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{a^2f^2g^2n^2\log^2(F)}-\frac{(c+dx)^2\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{a^2fgn\log(F)}-\frac{(c+dx)^2}{a^2fgn\log(F)}+\frac{(c+dx)^3}{3a^2d}+\frac{(c+dx)^2}{afgn\log(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^2/(a + b*(F^(g*(e + f*x)))^n)^2,x]
```

```
[Out] (c + d*x)^3/(3*a^2*d) - (c + d*x)^2/(a^2*f*g*n*Log[F]) + (c + d*x
)^2/(a*f*(a + b*(F^(g*(e + f*x)))^n)*g*n*Log[F]) + (2*d*(c + d*x)
*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(a^2*f^2*g^2*n^2*Log[F]^2) -
 ((c + d*x)^2*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(a^2*f*g*n*Log[
F]) + (2*d^2*PolyLog[2, -((b*(F^(g*(e + f*x)))^n)/a)])/(a^2*f^3*g
^3*n^3*Log[F]^3) - (2*d*(c + d*x)*PolyLog[2, -((b*(F^(g*(e + f*x)
))^n)/a)])/(a^2*f^2*g^2*n^2*Log[F]^2) + (2*d^2*PolyLog[3, -((b*(F
^(g*(e + f*x)))^n)/a)])/(a^2*f^3*g^3*n^3*Log[F]^3)
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**2/(a+b*(F**(g*(f*x+e)))**n)**2,x)
```

```
[Out] Timed out
```

Mathematica [A] time = 3.26952, size = 0, normalized size = 0.

$$\int \frac{(c+dx)^2}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(c + d*x)^2/(a + b*(F^(g*(e + f*x)))^n)^2,x]
```

```
[Out] Integrate[(c + d*x)^2/(a + b*(F^(g*(e + f*x)))^n)^2, x]
```

Maple [B] time = 0.05, size = 1251, normalized size = 4.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^2/(a+b*(F^(g*(f*x+e)))^n)^2,x)
```

```
[Out] 2/n/g^2/f^2/ln(F)^2/a^2*d^2*ln(a+b*(F^(g*(f*x+e)))^n)*ln(F^(g*(f*
x+e)))*x-2/n/g^2/f^2/ln(F)^2/a^2*d^2*ln(1+b*(F^(g*(f*x+e)))^n/a)*
```

```
ln(F^(g*(f*x+e)))*x-2/n/g^2/f^2/ln(F)^2/a^2*c*d*ln(1+b*(F^(g*(f*x
+e)))^n/a)*ln(F^(g*(f*x+e)))+2/n/g/f/ln(F)/a^2*c*d*ln((F^(g*(f*x+
e)))^n)*x-2/n/g^2/f^2/ln(F)^2/a^2*c*d*ln((F^(g*(f*x+e)))^n)*ln(F^
(g*(f*x+e)))-2/n/g/f/ln(F)/a^2*c*d*ln(a+b*(F^(g*(f*x+e)))^n)*x+2/
n/g^2/f^2/ln(F)^2/a^2*c*d*ln(a+b*(F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+
e)))-2/n/g^2/f^2/ln(F)^2/a^2*d^2*ln((F^(g*(f*x+e)))^n)*ln(F^(g*(f
*x+e)))*x+2*d^2*polylog(2,-b*(F^(g*(f*x+e)))^n/a)/a^2/f^3/g^3/n^3
/ln(F)^3+2*d^2*polylog(3,-b*(F^(g*(f*x+e)))^n/a)/a^2/f^3/g^3/n^3/
ln(F)^3+2/n^2/g^3/f^3/ln(F)^3/a^2*d^2*ln(1+b*(F^(g*(f*x+e)))^n/a)
*ln(F^(g*(f*x+e)))+2/n^2/g^2/f^2/ln(F)^2/a^2*d^2*ln(a+b*(F^(g*(f*
x+e)))^n)*x-2/n^2/g^3/f^3/ln(F)^3/a^2*d^2*ln(a+b*(F^(g*(f*x+e)))^
n)*ln(F^(g*(f*x+e)))-2/n^2/g^2/f^2/ln(F)^2/a^2*d^2*ln((F^(g*(f*x+
e)))^n)*x+2/n^2/g^3/f^3/ln(F)^3/a^2*d^2*ln((F^(g*(f*x+e)))^n)*ln(
F^(g*(f*x+e)))-2/n^2/g^2/f^2/ln(F)^2/a^2*d^2*polylog(2,-b*(F^(g*(
f*x+e)))^n/a)*x+1/n/g/f/ln(F)/a^2*d^2*ln((F^(g*(f*x+e)))^n)*x^2+1
/n/g^3/f^3/ln(F)^3/a^2*d^2*ln((F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e))
)^2-1/n/g/f/ln(F)/a^2*d^2*ln(a+b*(F^(g*(f*x+e)))^n)*x^2-1/n/g^3/f
^3/ln(F)^3/a^2*d^2*ln(a+b*(F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)))^2+
1/n/g^3/f^3/ln(F)^3/a^2*d^2*ln(1+b*(F^(g*(f*x+e)))^n/a)*ln(F^(g*(
f*x+e)))^2+2/n^2/g^2/f^2/ln(F)^2/a^2*c*d*ln(a+b*(F^(g*(f*x+e)))^n
)-2/n^2/g^2/f^2/ln(F)^2/a^2*c*d*polylog(2,-b*(F^(g*(f*x+e)))^n/a)
-2/n^2/g^2/f^2/ln(F)^2/a^2*c*d*ln((F^(g*(f*x+e)))^n)+1/n/g/f/ln(F
)/a*(d^2*x^2+2*c*d*x+c^2)/(a+b*(F^(g*(f*x+e)))^n)+1/n/g/f/ln(F)/a
^2*c^2*ln((F^(g*(f*x+e)))^n)-1/n/g/f/ln(F)/a^2*c^2*ln(a+b*(F^(g*(
f*x+e)))^n)+1/g^2/f^2/ln(F)^2/a^2*c*d*ln(F^(g*(f*x+e)))^2+1/g^2/f
^2/ln(F)^2/a^2*d^2*ln(F^(g*(f*x+e)))^2*x-1/n/g^3/f^3/ln(F)^3/a^2*
d^2*ln(F^(g*(f*x+e)))^2-2/3/g^3/f^3/ln(F)^3/a^2*d^2*ln(F^(g*(f*x+
e)))^3
```

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

$$c^2\left(\frac{1}{\left(\left(F^{fgx+eg}\right)^n abn + a^2 n\right) fg\log(F)} + \frac{\log\left(F^{fgx+eg}\right)}{a^2 fg\log(F)} - \frac{\log\left(\frac{\left(F^{fgx+eg}\right)^n b + a}{b}\right)}{a^2 fgn\log(F)}\right) + \frac{d^2x^2 + 2\,cdx}{\left(F^{fgx}\right)^n (F^{eg})^n abfgn\log(F) + a^2 fgn\log(F)} + \int \frac{d^2 fgnx^2\log(F) - 2\,cd + 2\left(cdfgn\log(F) - d^2\right)x}{\left(F^{fgx}\right)^n (F^{eg})^n abfgn\log(F) + a^2 fgn\log(F)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x + c)^2/((F^((f*x + e)*g))^n*b + a)^2,x, algorithm="maxima")
```

```
[Out] c^2*(1/(((F^(f*g*x + e*g))^n*a*b*n + a^2*n)*f*g*log(F)) + log(F^(
f*g*x + e*g))/(a^2*f*g*log(F)) - log(((F^(f*g*x + e*g))^n*b + a)/
```

```
b)/(a^2*f*g*n*log(F))) + (d^2*x^2 + 2*c*d*x)/((F^(f*g*x))^n*(F^(e
*g))^n*a*b*f*g*n*log(F) + a^2*f*g*n*log(F)) + integrate((d^2*f*g*
n*x^2*log(F) - 2*c*d + 2*(c*d*f*g*n*log(F) - d^2)*x)/((F^(f*g*x))
^n*(F^(e*g))^n*a*b*f*g*n*log(F) + a^2*f*g*n*log(F)), x)
```

Fricas [A] time = 0.283127, size = 1126, normalized size = 3.83

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x + c)^2/((F^((f*x + e)*g))^n*b + a)^2,x, algorithm="fricas")
```

```
[Out] 1/3*(3*(a*d^2*e^2 - 2*a*c*d*e*f + a*c^2*f^2)*g^2*n^2*log(F)^2 + (
a*d^2*f^3*g^3*n^3*x^3 + 3*a*c*d*f^3*g^3*n^3*x^2 + 3*a*c^2*f^3*g^3
*n^3*x + (a*d^2*e^3 - 3*a*c*d*e^2*f + 3*a*c^2*e*f^2)*g^3*n^3)*log
(F)^3 + ((b*d^2*f^3*g^3*n^3*x^3 + 3*b*c*d*f^3*g^3*n^3*x^2 + 3*b*c
^2*f^3*g^3*n^3*x + (b*d^2*e^3 - 3*b*c*d*e^2*f + 3*b*c^2*e*f^2)*g^
3*n^3)*log(F)^3 - 3*(b*d^2*f^2*g^2*n^2*x^2 + 2*b*c*d*f^2*g^2*n^2*
x - (b*d^2*e^2 - 2*b*c*d*e*f)*g^2*n^2)*log(F)^2)*F^(f*g*n*x + e*g
*n) + 6*(a*d^2 + (b*d^2 - (b*d^2*f*g*n*x + b*c*d*f*g*n)*log(F))*F
^(f*g*n*x + e*g*n) - (a*d^2*f*g*n*x + a*c*d*f*g*n)*log(F))*dilog(
-(F^(f*g*n*x + e*g*n)*b + a)/a + 1) - 3*((a*d^2*e^2 - 2*a*c*d*e*f
 + a*c^2*f^2)*g^2*n^2*log(F)^2 + 2*(a*d^2*e - a*c*d*f)*g*n*log(F)
 + ((b*d^2*e^2 - 2*b*c*d*e*f + b*c^2*f^2)*g^2*n^2*log(F)^2 + 2*(b
*d^2*e - b*c*d*f)*g*n*log(F))*F^(f*g*n*x + e*g*n))*log(F^(f*g*n*x
 + e*g*n)*b + a) - 3*((a*d^2*f^2*g^2*n^2*x^2 + 2*a*c*d*f^2*g^2*n^
2*x - (a*d^2*e^2 - 2*a*c*d*e*f)*g^2*n^2)*log(F)^2 + ((b*d^2*f^2*g
^2*n^2*x^2 + 2*b*c*d*f^2*g^2*n^2*x - (b*d^2*e^2 - 2*b*c*d*e*f)*g^
2*n^2)*log(F)^2 - 2*(b*d^2*f*g*n*x + b*d^2*e*g*n)*log(F))*F^(f*g*
n*x + e*g*n) - 2*(a*d^2*f*g*n*x + a*d^2*e*g*n)*log(F))*log((F^(f*
g*n*x + e*g*n)*b + a)/a) + 6*(F^(f*g*n*x + e*g*n)*b*d^2 + a*d^2)*
polylog(3, -F^(f*g*n*x + e*g*n)*b/a))/(F^(f*g*n*x + e*g*n)*a^2*b*
f^3*g^3*n^3*log(F)^3 + a^3*f^3*g^3*n^3*log(F)^3)
```

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

$$\frac{c^2 + 2cdx + d^2x^2}{a^2 fgn \log(F) + abfgn \left(F^{g(e+fx)}\right)^n \log(F)} + \frac{\int \left(-\frac{2cd}{a+be^{egn\log(F)}e^{fgnx\log(F)}}\right)\, dx + \int \left(-\frac{2d^2x}{a+be^{egn\log(F)}e^{fgnx\log(F)}}\right)\, dx + \int \frac{c^2 fgn\log(F)}{a+be^{egn\log(F)}e^{fgnx\log(F)}}\, dx + \int \frac{d^2 fgnx^2\log(F)}{a+be^{egn\log(F)}e^{fgnx\log(F)}}\, dx +}{afgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**2/(a+b*(F**(g*(f*x+e)))**n)**2,x)
```

```
[Out] (c**2 + 2*c*d*x + d**2*x**2)/(a**2*f*g*n*log(F) + a*b*f*g*n*(F**(
g*(e + f*x)))**n*log(F)) + (Integral(-2*c*d/(a + b*exp(e*g*n*log(
F))*exp(f*g*n*x*log(F))), x) + Integral(-2*d**2*x/(a + b*exp(e*g*
n*log(F))*exp(f*g*n*x*log(F))), x) + Integral(c**2*f*g*n*log(F)/(
a + b*exp(e*g*n*log(F))*exp(f*g*n*x*log(F))), x) + Integral(d**2*
f*g*n*x**2*log(F)/(a + b*exp(e*g*n*log(F))*exp(f*g*n*x*log(F))),
x) + Integral(2*c*d*f*g*n*x*log(F)/(a + b*exp(e*g*n*log(F))*exp(f
*g*n*x*log(F))), x))/(a*f*g*n*log(F))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx+c)^2}{\left(\left(F^{(fx+e)g}\right)^n b+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^2/((F^((f*x + e)*g))^n*b + a)^2,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^2/((F^((f*x + e)*g))^n*b + a)^2, x)
```

3.54 $\int \frac{c+dx}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2}\,dx$

Optimal. Leaf size=191

$$-\frac{d\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^2f^2g^2n^2\log^2(F)}-\frac{(c+dx)\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{a^2fgn\log(F)}+\frac{d\log\left(a+b\left(F^{g(e+fx)}\right)^n\right)}{a^2f^2g^2n^2\log^2(F)}+\frac{(c+dx)^2}{2a^2d}-\frac{dx}{a^2fgn\log(F)}+\frac{c+dx}{afgn\log(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)}$$

```
[Out] (c + d*x)^2/(2*a^2*d) - (d*x)/(a^2*f*g*n*Log[F]) + (c + d*x)/(a*f
*(a + b*(F^(g*(e + f*x)))^n)*g*n*Log[F]) + (d*Log[a + b*(F^(g*(e
+ f*x)))^n])/(a^2*f^2*g^2*n^2*Log[F]^2) - ((c + d*x)*Log[1 + (b*(
F^(g*(e + f*x)))^n)/a])/(a^2*f*g*n*Log[F]) - (d*PolyLog[2, -((b*(
F^(g*(e + f*x)))^n)/a)])/(a^2*f^2*g^2*n^2*Log[F]^2)
```

Rubi [A] time = 0.56891, antiderivative size = 191, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 11, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.478

$$-\frac{d\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^2f^2g^2n^2\log^2(F)}-\frac{(c+dx)\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{a^2fgn\log(F)}+\frac{d\log\left(a+b\left(F^{g(e+fx)}\right)^n\right)}{a^2f^2g^2n^2\log^2(F)}+\frac{(c+dx)^2}{2a^2d}-\frac{dx}{a^2fgn\log(F)}+\frac{c+dx}{afgn\log(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)/(a + b*(F^(g*(e + f*x)))^n)^2,x]
```


```
[Out] (c + d*x)^2/(2*a^2*d) - (d*x)/(a^2*f*g*n*Log[F]) + (c + d*x)/(a*f
*(a + b*(F^(g*(e + f*x)))^n)*g*n*Log[F]) + (d*Log[a + b*(F^(g*(e
+ f*x)))^n])/(a^2*f^2*g^2*n^2*Log[F]^2) - ((c + d*x)*Log[1 + (b*(
F^(g*(e + f*x)))^n)/a])/(a^2*f*g*n*Log[F]) - (d*PolyLog[2, -((b*(
F^(g*(e + f*x)))^n)/a)])/(a^2*f^2*g^2*n^2*Log[F]^2)
```

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

$$\frac{c+dx}{afgn\left(a+b\left(F^{g(e+fx)}\right)^n\right)\log(F)}+\frac{d\int x\,dx}{a^2}-\frac{dx\log\left(1+\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^2fgn\log(F)}+\frac{dx\log\left(a+b\left(F^{g(e+fx)}\right)^n\right)}{a^2fgn\log(F)}-\frac{dx\log\left(\left(F^{g(e+fx)}\right)^n\right)}{a^2fgn\log(F)}+\frac{d\log\left(a+b\left(F^{g(e+fx)}\right)^n\right)}{a^2f^2g^2n^2\log(F)^2}-\frac{d\log\left(\left(F^{g(e+fx)}\right)^n\right)}{a^2f^2g^2n^2\log(F)^2}-\frac{d\,\mathrm{Li}_2\left(-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^2f^2g^2n^2\log(F)^2}-\frac{(c+dx)\log\left(a+b\left(F^{g(e+fx)}\right)^n\right)}{a^2fgn\log(F)}+\frac{(c+dx)\log\left(\left(F^{g(e+fx)}\right)^n\right)}{a^2fgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)/(a+b*(F**(g*(f*x+e)))**n)**2,x)
```

```
[Out] (c + d*x)/(a*f*g*n*(a + b*(F**(g*(e + f*x)))**n)*log(F)) + d*Inte
gral(x, x)/a**2 - d*x*log(1 + b*(F**(g*(e + f*x)))**n/a)/(a**2*f*
g*n*log(F)) + d*x*log(a + b*(F**(g*(e + f*x)))**n)/(a**2*f*g*n*lo
g(F)) - d*x*log((F**(g*(e + f*x)))**n)/(a**2*f*g*n*log(F)) + d*lo
g(a + b*(F**(g*(e + f*x)))**n)/(a**2*f**2*g**2*n**2*log(F)**2) -
d*log((F**(g*(e + f*x)))**n)/(a**2*f**2*g**2*n**2*log(F)**2) - d*
polylog(2, -b*(F**(g*(e + f*x)))**n/a)/(a**2*f**2*g**2*n**2*log(F
)**2) - (c + d*x)*log(a + b*(F**(g*(e + f*x)))**n)/(a**2*f*g*n*lo
g(F)) + (c + d*x)*log((F**(g*(e + f*x)))**n)/(a**2*f*g*n*log(F))
```

Mathematica [A] time = 90.7211, size = 0, normalized size = 0.

$$\int\frac{c+dx}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(c + d*x)/(a + b*(F^(g*(e + f*x)))^n)^2,x]
```

```
[Out] Integrate[(c + d*x)/(a + b*(F^(g*(e + f*x)))^n)^2, x]
```

Maple [B] time = 0.085, size = 437, normalized size = 2.3

$$\frac{dx+c}{af\left(a+b\left(F^{g(fx+e)}\right)^{n}\right)gn\ln(F)}+\frac{c\ln\left(\left(F^{g(fx+e)}\right)^{n}\right)}{\ln(F)\,a^{2}fgn}-\frac{c\ln\left(a+b\left(F^{g(fx+e)}\right)^{n}\right)}{\ln(F)\,a^{2}fgn}$$
$$-\frac{d}{a^{2}f^{2}g^{2}n^{2}\left(\ln(F)\right)^{2}}polylog\left(2,-\frac{b\left(F^{g(fx+e)}\right)^{n}}{a}\right)-\frac{d\ln\left(\left(F^{g(fx+e)}\right)^{n}\right)}{a^{2}f^{2}g^{2}n^{2}\left(\ln(F)\right)^{2}}$$
$$+\frac{d\ln\left(a+b\left(F^{g(fx+e)}\right)^{n}\right)}{a^{2}f^{2}g^{2}n^{2}\left(\ln(F)\right)^{2}}-\frac{d\ln\left(F^{g(fx+e)}\right)}{\left(\ln(F)\right)^{2}a^{2}f^{2}g^{2}n}\ln\left(1+\frac{b\left(F^{g(fx+e)}\right)^{n}}{a}\right)$$
$$+\frac{d\ln\left(\left(F^{g(fx+e)}\right)^{n}\right)x}{\ln(F)\,a^{2}fgn}-\frac{d\ln\left(\left(F^{g(fx+e)}\right)^{n}\right)\ln\left(F^{g(fx+e)}\right)}{\left(\ln(F)\right)^{2}a^{2}f^{2}g^{2}n}-\frac{d\ln\left(a+b\left(F^{g(fx+e)}\right)^{n}\right)x}{\ln(F)\,a^{2}fgn}$$
$$+\frac{d\ln\left(a+b\left(F^{g(fx+e)}\right)^{n}\right)\ln\left(F^{g(fx+e)}\right)}{\left(\ln(F)\right)^{2}a^{2}f^{2}g^{2}n}+\frac{d\left(\ln\left(F^{g(fx+e)}\right)\right)^{2}}{2\left(\ln(F)\right)^{2}a^{2}f^{2}g^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)/(a+b*(F^(g*(f*x+e)))^n)^2,x)
```

```
[Out] (d*x+c)/a/f/(a+b*(F^(g*(f*x+e)))^n)/g/n/ln(F)+1/ln(F)/a^2/f/g/n*c
*ln((F^(g*(f*x+e)))^n)-1/ln(F)/a^2/f/g/n*c*ln(a+b*(F^(g*(f*x+e)))
^n)-d*polylog(2,-b*(F^(g*(f*x+e)))^n/a)/a^2/f^2/g^2/n^2/ln(F)^2-1
/ln(F)^2/a^2/f^2/g^2/n^2*d*ln((F^(g*(f*x+e)))^n)+d*ln(a+b*(F^(g*(
f*x+e)))^n)/a^2/f^2/g^2/n^2/ln(F)^2-1/ln(F)^2/a^2/f^2/g^2/n*d*ln(
1+b*(F^(g*(f*x+e)))^n/a)*ln(F^(g*(f*x+e)))+1/ln(F)/a^2/f/g/n*d*ln
((F^(g*(f*x+e)))^n)*x-1/ln(F)^2/a^2/f^2/g^2/n*d*ln((F^(g*(f*x+e))
)^n)*ln(F^(g*(f*x+e)))-1/ln(F)/a^2/f/g/n*d*ln(a+b*(F^(g*(f*x+e)))
^n)*x+1/ln(F)^2/a^2/f^2/g^2/n*d*ln(a+b*(F^(g*(f*x+e)))^n)*ln(F^(g
*(f*x+e)))+1/2/ln(F)^2/a^2/f^2/g^2*d*ln(F^(g*(f*x+e)))^2
```

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

$$d\left(\frac{x}{\left(F^{fgx}\right)^{n}\left(F^{eg}\right)^{n}abfgn\log(F)+a^{2}fgn\log(F)}+\int\frac{fgnx\log(F)-1}{\left(F^{fgx}\right)^{n}\left(F^{eg}\right)^{n}abfgn\log(F)+a^{2}fgn\log(F)}\,dx\right)$$
$$+c\left(\frac{1}{\left(\left(F^{fgx+eg}\right)^{n}abn+a^{2}n\right)fg\log(F)}+\frac{\log\left(F^{fgx+eg}\right)}{a^{2}fg\log(F)}-\frac{\log\left(\frac{\left(F^{fgx+eg}\right)^{n}b+a}{b}\right)}{a^{2}fgn\log(F)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)/((F^((f*x + e)*g))^n*b + a)^2,x, algorithm="maxima")
```

```
[Out] d*(x/((F^(f*g*x))^n*(F^(e*g))^n*a*b*f*g*n*log(F) + a^2*f*g*n*log(
F)) + integrate((f*g*n*x*log(F) - 1)/((F^(f*g*x))^n*(F^(e*g))^n*a
*b*f*g*n*log(F) + a^2*f*g*n*log(F)), x)) + c*(1/(((F^(f*g*x + e*g
))^n*a*b*n + a^2*n)*f*g*log(F)) + log(F^(f*g*x + e*g))/(a^2*f*g*l
og(F)) - log(((F^(f*g*x + e*g))^n*b + a)/b)/(a^2*f*g*n*log(F)))
```

Fricas [A] time = 0.267044, size = 540, normalized size = 2.83

$$-\frac{2\,(ade-acf)gn\log(F)-\left(adf^2g^2n^2x^2+2\,acf^2g^2n^2x-\left(ade^2-2\,acef\right)g^2n^2\right)\log(F)^2-\left(\left(bdf^2g^2n^2x^2+2\,bcf^2g^2n^2x-\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)/((F^((f*x + e)*g))^n*b + a)^2,x, algorithm="fricas")
```

```
[Out] -1/2*(2*(a*d*e - a*c*f)*g*n*log(F) - (a*d*f^2*g^2*n^2*x^2 + 2*a*c
*f^2*g^2*n^2*x - (a*d*e^2 - 2*a*c*e*f)*g^2*n^2)*log(F)^2 - ((b*d*
f^2*g^2*n^2*x^2 + 2*b*c*f^2*g^2*n^2*x - (b*d*e^2 - 2*b*c*e*f)*g^2
*n^2)*log(F)^2 - 2*(b*d*f*g*n*x + b*d*e*g*n)*log(F))*F^(f*g*n*x +
 e*g*n) + 2*(F^(f*g*n*x + e*g*n)*b*d + a*d)*dilog(-(F^(f*g*n*x +
e*g*n)*b + a)/a + 1) - 2*((a*d*e - a*c*f)*g*n*log(F) + ((b*d*e -
b*c*f)*g*n*log(F) + b*d)*F^(f*g*n*x + e*g*n) + a*d)*log(F^(f*g*n*
x + e*g*n)*b + a) + 2*((b*d*f*g*n*x + b*d*e*g*n)*F^(f*g*n*x + e*g
*n)*log(F) + (a*d*f*g*n*x + a*d*e*g*n)*log(F))*log((F^(f*g*n*x +
e*g*n)*b + a)/a))/(F^(f*g*n*x + e*g*n)*a^2*b*f^2*g^2*n^2*log(F)^2
 + a^3*f^2*g^2*n^2*log(F)^2)
```

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

$$\frac{c+dx}{a^2fgn\log(F)+abfgn\left(F^{g(e+fx)}\right)^n\log(F)}+\frac{\int\left(-\frac{d}{a+be^{egn\log(F)}e^{fgnx\log(F)}}\right)dx+\int\frac{cfgn\log(F)}{a+be^{egn\log(F)}e^{fgnx\log(F)}}\,dx+\int\frac{dfgnx\log(F)}{a+be^{egn\log(F)}e^{fgnx\log(F)}}\,dx}{afgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)/(a+b*(F**(g*(f*x+e)))**n)**2,x)
```

```
[Out] (c + d*x)/(a**2*f*g*n*log(F) + a*b*f*g*n*(F**(g*(e + f*x)))**n*lo
g(F)) + (Integral(-d/(a + b*exp(e*g*n*log(F))*exp(f*g*n*x*log(F))
```

```
), x) + Integral(c*f*g*n*log(F)/(a + b*exp(e*g*n*log(F))*exp(f*g*
n*x*log(F))), x) + Integral(d*f*g*n*x*log(F)/(a + b*exp(e*g*n*log
(F))*exp(f*g*n*x*log(F))), x))/(a*f*g*n*log(F))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{dx+c}{\left(\left(F^{(fx+e)g}\right)^{n}b+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)/((F^((f*x + e)*g))^n*b + a)^2,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)/((F^((f*x + e)*g))^n*b + a)^2, x)
```

3.55 $\int \frac{1}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2}\,dx$

Optimal. Leaf size=74

$$-\frac{\log\left(a+b\left(F^{g(e+fx)}\right)^n\right)}{a^2 fgn\log(F)}+\frac{x}{a^2}+\frac{1}{afgn\log(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)}$$

```
[Out] x/a^2 + 1/(a*f*(a + b*(F^(g*(e + f*x)))^n)*g*n*Log[F]) - Log[a +
b*(F^(g*(e + f*x)))^n]/(a^2*f*g*n*Log[F])
```

Rubi [A] time = 0.108203, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176

$$-\frac{\log\left(a+b\left(F^{g(e+fx)}\right)^n\right)}{a^2 fgn\log(F)}+\frac{x}{a^2}+\frac{1}{afgn\log(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)^(-2),x]
```

```
[Out] x/a^2 + 1/(a*f*(a + b*(F^(g*(e + f*x)))^n)*g*n*Log[F]) - Log[a +
b*(F^(g*(e + f*x)))^n]/(a^2*f*g*n*Log[F])
```

Rubi in Sympy [A] time = 20.2427, size = 75, normalized size = 1.01

$$\frac{1}{afgn\left(a+b\left(F^{g(e+fx)}\right)^n\right)\log(F)}-\frac{\log\left(a+b\left(F^{g(e+fx)}\right)^n\right)}{a^2 fgn\log(F)}+\frac{\log\left(\left(F^{g(e+fx)}\right)^n\right)}{a^2 fgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*(F**(g*(f*x+e)))**n)**2,x)
```

```
[Out] 1/(a*f*g*n*(a + b*(F**(g*(e + f*x)))**n)*log(F)) - log(a + b*(F**
(g*(e + f*x)))**n)/(a**2*f*g*n*log(F)) + log((F**(g*(e + f*x)))**
n)/(a**2*f*g*n*log(F))
```

Mathematica [A] time = 0.192189, size = 68, normalized size = 0.92

$$\frac{\frac{a}{afgn\log(F)+bfgn\log(F)\left(F^{eg+fgx}\right)^n}-\frac{\log\left(a+b\left(F^{g(e+fx)}\right)^n\right)}{fgn\log(F)}+x}{a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)^(-2),x]
```

```
[Out] (x + a/(a*f*g*n*Log[F] + b*f*(F^(e*g + f*g*x))^n*g*n*Log[F]) - Lo
g[a + b*(F^(g*(e + f*x)))^n]/(f*g*n*Log[F]))/a^2
```

Maple [A] time = 0.003, size = 99, normalized size = 1.3

$$\frac{\ln\left(\left(F^{g(fx+e)}\right)^n\right)}{ngf\ln(F)a^2}-\frac{\ln\left(a+b\left(F^{g(fx+e)}\right)^n\right)}{ngf\ln(F)a^2}+\frac{1}{af\left(a+b\left(F^{g(fx+e)}\right)^n\right)gn\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*(F^(g*(f*x+e)))^n)^2,x)
```

```
[Out] 1/g/f/ln(F)/n/a^2*ln((F^(g*(f*x+e)))^n)-ln(a+b*(F^(g*(f*x+e)))^n)
/a^2/f/g/n/ln(F)+1/a/f/(a+b*(F^(g*(f*x+e)))^n)/g/n/ln(F)
```

Maxima [A] time = 0.773008, size = 135, normalized size = 1.82

$$\frac{1}{\left(\left(F^{fgx+eg}\right)^n abn+a^2n\right)fg\log(F)}+\frac{\log\left(F^{fgx+eg}\right)}{a^2fg\log(F)}-\frac{\log\left(\frac{\left(F^{fgx+eg}\right)^n b+a}{b}\right)}{a^2fgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)^(-2),x, algorithm="maxima")
```

```
[Out] 1/(((F^(f*g*x + e*g))^n*a*b*n + a^2*n)*f*g*log(F)) + log(F^(f*g*x
 + e*g))/(a^2*f*g*log(F)) - log(((F^(f*g*x + e*g))^n*b + a)/b)/(a
^2*f*g*n*log(F))
```

Fricas [A] time = 0.27551, size = 135, normalized size = 1.82

$$\frac{F^{fgnx+egn}bfgnx\log(F)+afgnx\log(F)-\left(F^{fgnx+egn}b+a\right)\log\left(F^{fgnx+egn}b+a\right)+a}{F^{fgnx+egn}a^2bfgn\log(F)+a^3fgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)^(-2),x, algorithm="fricas")
```

```
[Out] (F^(f*g*n*x + e*g*n)*b*f*g*n*x*log(F) + a*f*g*n*x*log(F) - (F^(f*
g*n*x + e*g*n)*b + a)*log(F^(f*g*n*x + e*g*n)*b + a) + a)/(F^(f*g
*n*x + e*g*n)*a^2*b*f*g*n*log(F) + a^3*f*g*n*log(F))
```

Sympy [A] time = 0.427752, size = 66, normalized size = 0.89

$$\frac{1}{a^2fgn\log(F)+abfgn\left(F^{g(e+fx)}\right)^n\log(F)}+\frac{x}{a^2}-\frac{\log\left(\frac{a}{b}+\left(F^{g(e+fx)}\right)^n\right)}{a^2fgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*(F**(g*(f*x+e)))**n)**2,x)
```

```
[Out] 1/(a**2*f*g*n*log(F) + a*b*f*g*n*(F**(g*(e + f*x)))**n*log(F)) +
x/a**2 - log(a/b + (F**(g*(e + f*x)))**n)/(a**2*f*g*n*log(F))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left(\left(F^{(fx+e)g}\right)^nb+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)^(-2),x, algorithm="giac")
```

```
[Out] integrate(((F^((f*x + e)*g))^n*b + a)^(-2), x)
```

3.56 $\int \frac{1}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2(c+dx)}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{1}{(c+dx)\left(a+b\left(F^{eg+fgx}\right)^n\right)^2},x\right)$$

```
[Out] Unintegrable[1/((a + b*(F^(e*g + f*g*x))^n)^2*(c + d*x)), x]
```

Rubi [A] time = 0.200273, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.

$$\text{Int}\left(\frac{1}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2(c+dx)},x\right)$$

Verification is Not applicable to the result.

```
[In]  Int[1/((a + b*(F^(g*(e + f*x)))^n)^2*(c + d*x)),x]

[Out] Defer[Int][1/((a + b*(F^(e*g + f*g*x))^n)^2*(c + d*x)), x]
```

Rubi in Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\left(F^{eg+fgx}\right)^n\right)^2(c+dx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*(F**(g*(f*x+e)))**n)**2/(d*x+c),x)

[Out] Integral(1/((a + b*(F**(e*g + f*g*x))**n)**2*(c + d*x)), x)
```

Mathematica [A] time = 1.46215, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2(c+dx)}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[1/((a + b*(F^(g*(e + f*x)))^n)^2*(c + d*x)),x]
```

```
[Out] Integrate[1/((a + b*(F^(g*(e + f*x)))^n)^2*(c + d*x)), x]
```

Maple [A] time = 0.415, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\left(F^{g(fx+e)}\right)^{n}\right)^{2}(dx+c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*(F^(g*(f*x+e)))^n)^2/(d*x+c),x)
```

```
[Out] int(1/(a+b*(F^(g*(f*x+e)))^n)^2/(d*x+c),x)
```

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

$$\frac{1}{a^2dfgnx\log(F)+a^2cfgn\log(F)+\left((F^{eg})^n abdfgnx\log(F)+(F^{eg})^n abcfgn\log(F)\right)\left(F^{fgx}\right)^n}$$
$$+\int\frac{dfgnx\log(F)+cfgn\log(F)+d}{a^2d^2fgnx^2\log(F)+2\,a^2cdfgnx\log(F)+a^2c^2fgn\log(F)+\left((F^{eg})^n abd^2fgnx^2\log(F)+2\,(F^{eg})^n abcdfgnx\log(F)+(F^{e\cdots}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((F^((f*x + e)*g))^n*b + a)^2*(d*x + c)),x, algorithm="maxima")
```

```
[Out] 1/(a^2*d*f*g*n*x*log(F) + a^2*c*f*g*n*log(F) + ((F^(e*g))^n*a*b*d
*f*g*n*x*log(F) + (F^(e*g))^n*a*b*c*f*g*n*log(F))*(F^(f*g*x))^n)
+ integrate((d*f*g*n*x*log(F) + c*f*g*n*log(F) + d)/(a^2*d^2*f*g*
n*x^2*log(F) + 2*a^2*c*d*f*g*n*x*log(F) + a^2*c^2*f*g*n*log(F) +
((F^(e*g))^n*a*b*d^2*f*g*n*x^2*log(F) + 2*(F^(e*g))^n*a*b*c*d*f*g
*n*x*log(F) + (F^(e*g))^n*a*b*c^2*f*g*n*log(F))*(F^(f*g*x))^n), x
)
```

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

$$\mathrm{integral}\left(\frac{1}{a^2dx+a^2c+(b^2dx+b^2c)\left(F^{fgx+eg}\right)^{2n}+2\,(abdx+abc)\left(F^{fgx+eg}\right)^{n}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((F^((f*x + e)*g))^n*b + a)^2*(d*x + c)),x, algorithm="fricas")
```

```
[Out] integral(1/(a^2*d*x + a^2*c + (b^2*d*x + b^2*c)*(F^(f*g*x + e*g))
^(2*n) + 2*(a*b*d*x + a*b*c)*(F^(f*g*x + e*g))^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*(F**(g*(f*x+e)))**n)**2/(d*x+c),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(\left(F^{(fx+e)g}\right)^n b + a\right)^2 (dx + c)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((F^((f*x + e)*g))^n*b + a)^2*(d*x + c)),x, algorithm="giac")
```

```
[Out] integrate(1/(((F^((f*x + e)*g))^n*b + a)^2*(d*x + c)), x)
```

3.57 $\int \frac{1}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2(c+dx)^2}\,dx$

Optimal. Leaf size=29

$$\mathrm{Int}\left(\frac{1}{(c+dx)^2\left(a+b\left(F^{eg+fgx}\right)^n\right)^2},x\right)$$

```
[Out] Unintegrable[1/((a + b*(F^(e*g + f*g*x))^n)^2*(c + d*x)^2), x]
```

Rubi [A] time = 0.184984, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$

$$\mathrm{Int}\left(\frac{1}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2(c+dx)^2},x\right)$$

Verification is Not applicable to the result.

```
[In]  Int[1/((a + b*(F^(g*(e + f*x)))^n)^2*(c + d*x)^2),x]
```

```
[Out] Defer[Int][1/((a + b*(F^(e*g + f*g*x))^n)^2*(c + d*x)^2), x]
```

Rubi in Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\left(F^{eg+fgx}\right)^n\right)^2(c+dx)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*(F**(g*(f*x+e)))**n)**2/(d*x+c)**2,x)
```

```
[Out] Integral(1/((a + b*(F**(e*g + f*g*x))**n)**2*(c + d*x)**2), x)
```

Mathematica [A] time = 1.5098, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2(c+dx)^2}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[1/((a + b*(F^(g*(e + f*x)))^n)^2*(c + d*x)^2),x]
```

```
[Out] Integrate[1/((a + b*(F^(g*(e + f*x)))^n)^2*(c + d*x)^2), x]
```

Maple [A] time = 0.219, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\left(F^{g(fx+e)}\right)^{n}\right)^{2}(dx+c)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*(F^(g*(f*x+e)))^n)^2/(d*x+c)^2,x)
```

```
[Out] int(1/(a+b*(F^(g*(f*x+e)))^n)^2/(d*x+c)^2,x)
```

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

$$\frac{1}{a^2d^2fgnx^2\log(F)+2\,a^2cdfgnx\log(F)+a^2c^2fgn\log(F)+\left((F^{eg})^n abd^2fgnx^2\log(F)+2\,(F^{eg})^n abcdfgnx\log(F)+(F^{eg})^n a\right.}$$
$$+\int\frac{dfgnx\log(F)+cfgn\log(F)+2\,d}{a^2d^3fgnx^3\log(F)+3\,a^2cd^2fgnx^2\log(F)+3\,a^2c^2dfgnx\log(F)+a^2c^3fgn\log(F)+\left((F^{eg})^n abd^3fgnx^3\log(F)+3\,(F^{eg})^{n}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((F^((f*x + e)*g))^n*b + a)^2*(d*x + c)^2),x, algorithm="maxima")
```

```
[Out] 1/(a^2*d^2*f*g*n*x^2*log(F) + 2*a^2*c*d*f*g*n*x*log(F) + a^2*c^2*
f*g*n*log(F) + ((F^(e*g))^n*a*b*d^2*f*g*n*x^2*log(F) + 2*(F^(e*g)
)^n*a*b*c*d*f*g*n*x*log(F) + (F^(e*g))^n*a*b*c^2*f*g*n*log(F))*(F
^(f*g*x))^n) + integrate((d*f*g*n*x*log(F) + c*f*g*n*log(F) + 2*d
)/(a^2*d^3*f*g*n*x^3*log(F) + 3*a^2*c*d^2*f*g*n*x^2*log(F) + 3*a^
2*c^2*d*f*g*n*x*log(F) + a^2*c^3*f*g*n*log(F) + ((F^(e*g))^n*a*b*
d^3*f*g*n*x^3*log(F) + 3*(F^(e*g))^n*a*b*c*d^2*f*g*n*x^2*log(F) +
 3*(F^(e*g))^n*a*b*c^2*d*f*g*n*x*log(F) + (F^(e*g))^n*a*b*c^3*f*g
*n*log(F))*(F^(f*g*x))^n), x)
```

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

$$\text{integral}\left(\frac{1}{a^2d^2x^2+2\,a^2cdx+a^2c^2+(b^2d^2x^2+2\,b^2cdx+b^2c^2)\left(F^{fgx+eg}\right)^{2\,n}+2\,(abd^2x^2+2\,abcdx+abc^2)\left(F^{fgx+eg}\right)^{n}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((F^((f*x + e)*g))^n*b + a)^2*(d*x + c)^2),x, algorithm="fricas")
```

```
[Out] integral(1/(a^2*d^2*x^2 + 2*a^2*c*d*x + a^2*c^2 + (b^2*d^2*x^2 +
2*b^2*c*d*x + b^2*c^2)*(F^(f*g*x + e*g))^(2*n) + 2*(a*b*d^2*x^2 +
 2*a*b*c*d*x + a*b*c^2)*(F^(f*g*x + e*g))^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*(F**(g*(f*x+e)))**n)**2/(d*x+c)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(\left(F^{(fx+e)g}\right)^{n} b + a\right)^{2} (dx + c)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((F^((f*x + e)*g))^n*b + a)^2*(d*x + c)^2),x, algorithm="giac")
```

```
[Out] integrate(1/(((F^((f*x + e)*g))^n*b + a)^2*(d*x + c)^2), x)
```

3.58 $\int \frac{(c+dx)^3}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^3}\,dx$

Optimal. Leaf size=594

$$\frac{9d^2(c+dx)\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^3f^3g^3n^3\log^3(F)}+\frac{6d^2(c+dx)\text{PolyLog}\left(3,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^3f^3g^3n^3\log^3(F)}-\frac{3d(c+dx)^2\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^3f^2g^2n^2\log^2(F)}-\frac{3d^3\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^3f^4g^4n^4\log^4(F)}-\frac{9d^3\text{PolyLog}\left(3,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^3f^4g^4n^4\log^4(F)}-\frac{6d^3\text{PolyLog}\left(4,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^3f^4g^4n^4\log^4(F)}-\frac{3d^2(c+dx)\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{a^3f^3g^3n^3\log^3(F)}+\frac{9d(c+dx)^2\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{2a^3f^2g^2n^2\log^2(F)}-\frac{(c+dx)^3\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{a^3fgn\log(F)}+\frac{3d(c+dx)^2}{2a^3f^2g^2n^2\log^2(F)}-\frac{3(c+dx)^3}{2a^3fgn\log(F)}+\frac{(c+dx)^4}{4a^3d}-\frac{3d(c+dx)^2}{2a^2f^2g^2n^2\log^2(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)}+\frac{(c+dx)^3}{a^2fgn\log(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)}+\frac{(c+dx)^3}{2afgn\log(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2}$$

```
[Out] (c + d*x)^4/(4*a^3*d) + (3*d*(c + d*x)^2)/(2*a^3*f^2*g^2*n^2*Log[
F]^2) - (3*d*(c + d*x)^2)/(2*a^2*f^2*(a + b*(F^(g*(e + f*x)))^n)*
g^2*n^2*Log[F]^2) - (3*(c + d*x)^3)/(2*a^3*f*g*n*Log[F]) + (c + d
*x)^3/(2*a*f*(a + b*(F^(g*(e + f*x)))^n)^2*g*n*Log[F]) + (c + d*x
)^3/(a^2*f*(a + b*(F^(g*(e + f*x)))^n)*g*n*Log[F]) - (3*d^2*(c +
d*x)*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(a^3*f^3*g^3*n^3*Log[F]^
3) + (9*d*(c + d*x)^2*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(2*a^3*
f^2*g^2*n^2*Log[F]^2) - ((c + d*x)^3*Log[1 + (b*(F^(g*(e + f*x)))
^n)/a])/(a^3*f*g*n*Log[F]) - (3*d^3*PolyLog[2, -((b*(F^(g*(e + f*
x)))^n)/a)])/(a^3*f^4*g^4*n^4*Log[F]^4) + (9*d^2*(c + d*x)*PolyLo
g[2, -((b*(F^(g*(e + f*x)))^n)/a)])/(a^3*f^3*g^3*n^3*Log[F]^3) -
(3*d*(c + d*x)^2*PolyLog[2, -((b*(F^(g*(e + f*x)))^n)/a)])/(a^3*f
^2*g^2*n^2*Log[F]^2) - (9*d^3*PolyLog[3, -((b*(F^(g*(e + f*x)))^n
)/a)])/(a^3*f^4*g^4*n^4*Log[F]^4) + (6*d^2*(c + d*x)*PolyLog[3, -
((b*(F^(g*(e + f*x)))^n)/a)])/(a^3*f^3*g^3*n^3*Log[F]^3) - (6*d^3
*PolyLog[4, -((b*(F^(g*(e + f*x)))^n)/a)])/(a^3*f^4*g^4*n^4*Log[F
]^4)
```

Rubi [A] time = 3.15226, antiderivative size = 594, normalized size of antiderivative = 1., number of steps used = 26, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.4$

$$\frac{9d^2(c+dx)\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^3f^3g^3n^3\log^3(F)}+\frac{6d^2(c+dx)\text{PolyLog}\left(3,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^3f^3g^3n^3\log^3(F)}-\frac{3d(c+dx)^2\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^3f^2g^2n^2\log^2(F)}-\frac{3d^3\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^3f^4g^4n^4\log^4(F)}-\frac{9d^3\text{PolyLog}\left(3,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^3f^4g^4n^4\log^4(F)}-\frac{6d^3\text{PolyLog}\left(4,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^3f^4g^4n^4\log^4(F)}-\frac{3d^2(c+dx)\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{a^3f^3g^3n^3\log^3(F)}+\frac{9d(c+dx)^2\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{2a^3f^2g^2n^2\log^2(F)}-\frac{(c+dx)^3\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{a^3fgn\log(F)}+\frac{3d(c+dx)^2}{2a^3f^2g^2n^2\log^2(F)}-\frac{3(c+dx)^3}{2a^3fgn\log(F)}+\frac{(c+dx)^4}{4a^3d}-\frac{3d(c+dx)^2}{2a^2f^2g^2n^2\log^2(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)}+\frac{(c+dx)^3}{a^2fgn\log(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)}+\frac{(c+dx)^3}{2afgn\log(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^3/(a + b*(F^(g*(e + f*x)))^n)^3,x]
```

```
[Out] (c + d*x)^4/(4*a^3*d) + (3*d*(c + d*x)^2)/(2*a^3*f^2*g^2*n^2*Log[
F]^2) - (3*d*(c + d*x)^2)/(2*a^2*f^2*(a + b*(F^(g*(e + f*x)))^n)*
g^2*n^2*Log[F]^2) - (3*(c + d*x)^3)/(2*a^3*f*g*n*Log[F]) + (c + d
*x)^3/(2*a*f*(a + b*(F^(g*(e + f*x)))^n)^2*g*n*Log[F]) + (c + d*x
)^3/(a^2*f*(a + b*(F^(g*(e + f*x)))^n)*g*n*Log[F]) - (3*d^2*(c +
d*x)*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(a^3*f^3*g^3*n^3*Log[F]^
3) + (9*d*(c + d*x)^2*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(2*a^3*
f^2*g^2*n^2*Log[F]^2) - ((c + d*x)^3*Log[1 + (b*(F^(g*(e + f*x)))
^n)/a])/(a^3*f*g*n*Log[F]) - (3*d^3*PolyLog[2, -((b*(F^(g*(e + f*
x)))^n)/a)])/(a^3*f^4*g^4*n^4*Log[F]^4) + (9*d^2*(c + d*x)*PolyLo
g[2, -((b*(F^(g*(e + f*x)))^n)/a)])/(a^3*f^3*g^3*n^3*Log[F]^3) -
(3*d*(c + d*x)^2*PolyLog[2, -((b*(F^(g*(e + f*x)))^n)/a)])/(a^3*f
^2*g^2*n^2*Log[F]^2) - (9*d^3*PolyLog[3, -((b*(F^(g*(e + f*x)))^n
)/a)])/(a^3*f^4*g^4*n^4*Log[F]^4) + (6*d^2*(c + d*x)*PolyLog[3, -
((b*(F^(g*(e + f*x)))^n)/a)])/(a^3*f^3*g^3*n^3*Log[F]^3) - (6*d^3
*PolyLog[4, -((b*(F^(g*(e + f*x)))^n)/a)])/(a^3*f^4*g^4*n^4*Log[F
```

```
]^4)
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((d*x+c)**3/(a+b*(F**(g*(f*x+e)))**n)**3,x)

[Out] Timed out
```

Mathematica [A] time = 4.08425, size = 0, normalized size = 0.

$$\int \frac{(c+dx)^3}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + d*x)^3/(a + b*(F^(g*(e + f*x)))^n)^3,x]

[Out] Integrate[(c + d*x)^3/(a + b*(F^(g*(e + f*x)))^n)^3, x]
```

Maple [B] time = 0.079, size = 3116, normalized size = 5.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*x+c)^3/(a+b*(F^(g*(f*x+e)))^n)^3,x)

[Out] -9*d^3*polylog(3,-b*(F^(g*(f*x+e)))^n/a)/a^3/f^4/g^4/n^4/ln(F)^4-
6*d^3*polylog(4,-b*(F^(g*(f*x+e)))^n/a)/a^3/f^4/g^4/n^4/ln(F)^4-3
*d^3*polylog(2,-b*(F^(g*(f*x+e)))^n/a)/a^3/f^4/g^4/n^4/ln(F)^4-1/
n/g/f/ln(F)/a^3*c^3*ln(a+b*(F^(g*(f*x+e)))^n)+3/n/g^4/f^4/ln(F)^4
/a^3*d^3*ln(F^(g*(f*x+e)))^3+1/n/g/f/ln(F)/a^3*c^3*ln((F^(g*(f*x+
e)))^n)+3/2/n^2/g^4/f^4/ln(F)^4/a^3*d^3*ln(F^(g*(f*x+e)))^2+3/2/g
^2/f^2/ln(F)^2/a^3*d^3*ln(F^(g*(f*x+e)))^2*x^2-2/g^3/f^3/ln(F)^3/
a^3*d^3*ln(F^(g*(f*x+e)))^3*x-2/g^3/f^3/ln(F)^3/a^3*c*d^2*ln(F^(g
```

```
*(f*x+e)))^3+3/2/g^2/f^2/ln(F)^2/a^3*d*c^2*ln(F^(g*(f*x+e)))^2+3/
n/g^3/f^3/ln(F)^3/a^3*d^3*ln((F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)))
^2*x+3/n/g^2/f^2/ln(F)^2/a^3*d^3*ln(a+b*(F^(g*(f*x+e)))^n)*ln(F^(
g*(f*x+e)))*x^2-3/n/g^3/f^3/ln(F)^3/a^3*d^3*ln(a+b*(F^(g*(f*x+e))
)^n)*ln(F^(g*(f*x+e)))^2*x-3/n/g^2/f^2/ln(F)^2/a^3*d^3*ln(1+b*(F^
(g*(f*x+e)))^n/a)*ln(F^(g*(f*x+e)))*x^2+3/n/g^3/f^3/ln(F)^3/a^3*d
^3*ln(1+b*(F^(g*(f*x+e)))^n/a)*ln(F^(g*(f*x+e)))^2*x-9/n^2/g^3/f^
3/ln(F)^3/a^3*d^3*ln(a+b*(F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)))*x-9
/n^2/g^2/f^2/ln(F)^2/a^3*c*d^2*ln((F^(g*(f*x+e)))^n)*x+9/n^2/g^3/
f^3/ln(F)^3/a^3*c*d^2*ln((F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)))+9/n
^2/g^2/f^2/ln(F)^2/a^3*c*d^2*ln(a+b*(F^(g*(f*x+e)))^n)*x-9/n^2/g^
3/f^3/ln(F)^3/a^3*c*d^2*ln(a+b*(F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)
))+9/n^2/g^3/f^3/ln(F)^3/a^3*d^3*ln(1+b*(F^(g*(f*x+e)))^n/a)*ln(F
^(g*(f*x+e)))*x+9/n^2/g^3/f^3/ln(F)^3/a^3*d^3*ln((F^(g*(f*x+e)))^
n)*ln(F^(g*(f*x+e)))*x+9/n^2/g^3/f^3/ln(F)^3/a^3*c*d^2*ln(1+b*(F^
(g*(f*x+e)))^n/a)*ln(F^(g*(f*x+e)))+3/n/g^2/f^2/ln(F)^2/a^3*c^2*d
*ln(a+b*(F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)))-3/n/g^2/f^2/ln(F)^2/
a^3*c^2*d*ln(1+b*(F^(g*(f*x+e)))^n/a)*ln(F^(g*(f*x+e)))-3/n/g^2/f
^2/ln(F)^2/a^3*c^2*d*ln((F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)))+3/n/
g^3/f^3/ln(F)^3/a^3*c*d^2*ln(1+b*(F^(g*(f*x+e)))^n/a)*ln(F^(g*(f*
x+e)))^2-3/n/g^2/f^2/ln(F)^2/a^3*d^3*ln((F^(g*(f*x+e)))^n)*ln(F^(
g*(f*x+e)))*x^2-6/n^2/g^2/f^2/ln(F)^2/a^3*c*d^2*polylog(2,-b*(F^(
g*(f*x+e)))^n/a)*x-3/n/g/f/ln(F)/a^3*c^2*d*ln(a+b*(F^(g*(f*x+e)))
^n)*x+3/n/g/f/ln(F)/a^3*c^2*d*ln((F^(g*(f*x+e)))^n)*x+3/n/g/f/ln(
F)/a^3*c*d^2*ln((F^(g*(f*x+e)))^n)*x^2+3/n/g^3/f^3/ln(F)^3/a^3*c*
d^2*ln((F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)))^2-3/n/g/f/ln(F)/a^3*c
*d^2*ln(a+b*(F^(g*(f*x+e)))^n)*x^2-3/n/g^3/f^3/ln(F)^3/a^3*c*d^2*
ln(a+b*(F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)))^2+3/n^3/g^4/f^4/ln(F)
^4/a^3*d^3*ln(a+b*(F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)))-3/n^3/g^4/
f^4/ln(F)^4/a^3*d^3*ln(1+b*(F^(g*(f*x+e)))^n/a)*ln(F^(g*(f*x+e)))
-9/2/n/g^3/f^3/ln(F)^3/a^3*d^3*ln(F^(g*(f*x+e)))^2*x+6/n^3/g^3/f^
3/ln(F)^3/a^3*d^3*polylog(3,-b*(F^(g*(f*x+e)))^n/a)*x+9/n^3/g^3/f
^3/ln(F)^3/a^3*d^3*polylog(2,-b*(F^(g*(f*x+e)))^n/a)*x+6/n^3/g^3/
f^3/ln(F)^3/a^3*c*d^2*polylog(3,-b*(F^(g*(f*x+e)))^n/a)-3/n^3/g^3
/f^3/ln(F)^3/a^3*c*d^2*ln(a+b*(F^(g*(f*x+e)))^n)+9/n^3/g^3/f^3/ln
(F)^3/a^3*c*d^2*polylog(2,-b*(F^(g*(f*x+e)))^n/a)+3/n^3/g^3/f^3/l
n(F)^3/a^3*c*d^2*ln((F^(g*(f*x+e)))^n)-9/2/n/g^3/f^3/ln(F)^3/a^3*
d^2*c*ln(F^(g*(f*x+e)))^2-9/2/n^2/g^2/f^2/ln(F)^2/a^3*c^2*d*ln((F
^(g*(f*x+e)))^n)+9/2/n^2/g^2/f^2/ln(F)^2/a^3*c^2*d*ln(a+b*(F^(g*(
f*x+e)))^n)-3/n^2/g^2/f^2/ln(F)^2/a^3*d^3*polylog(2,-b*(F^(g*(f*x
+e)))^n/a)*x^2-3/n^2/g^2/f^2/ln(F)^2/a^3*c^2*d*polylog(2,-b*(F^(g
*(f*x+e)))^n/a)-9/2/n^2/g^4/f^4/ln(F)^4/a^3*d^3*ln(1+b*(F^(g*(f*x
+e)))^n/a)*ln(F^(g*(f*x+e)))^2-9/2/n^2/g^2/f^2/ln(F)^2/a^3*d^3*ln
((F^(g*(f*x+e)))^n)*x^2-9/2/n^2/g^4/f^4/ln(F)^4/a^3*d^3*ln((F^(g*
(f*x+e)))^n)*ln(F^(g*(f*x+e)))^2+9/2/n^2/g^2/f^2/ln(F)^2/a^3*d^3*
ln(a+b*(F^(g*(f*x+e)))^n)*x^2+9/2/n^2/g^4/f^4/ln(F)^4/a^3*d^3*ln(
a+b*(F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)))^2-1/n/g^4/f^4/ln(F)^4/a^
3*d^3*ln(1+b*(F^(g*(f*x+e)))^n/a)*ln(F^(g*(f*x+e)))^3+1/n/g/f/ln(
F)/a^3*d^3*ln((F^(g*(f*x+e)))^n)*x^3-1/n/g^4/f^4/ln(F)^4/a^3*d^3*
ln((F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)))^3+3/g^2/f^2/ln(F)^2/a^3*c
*d^2*ln(F^(g*(f*x+e)))^2*x-1/n/g/f/ln(F)/a^3*d^3*ln(a+b*(F^(g*(f*
x+e)))^n)*x^3+1/n/g^4/f^4/ln(F)^4/a^3*d^3*ln(a+b*(F^(g*(f*x+e)))^
n)*ln(F^(g*(f*x+e)))^3+3/n^3/g^3/f^3/ln(F)^3/a^3*d^3*ln((F^(g*(f*
x+e)))^n)*x-3/n^3/g^4/f^4/ln(F)^4/a^3*d^3*ln((F^(g*(f*x+e)))^n)*l
```

```
n(F^(g*(f*x+e)))-3/n^3/g^3/f^3/ln(F)^3/a^3*d^3*ln(a+b*(F^(g*(f*x+
e)))^n)*x+1/2*(2*ln(F)*b*d^3*f*g*n*x^3*(F^(g*(f*x+e)))^n+3*ln(F)*
a*d^3*f*g*n*x^3+6*ln(F)*b*c*d^2*f*g*n*x^2*(F^(g*(f*x+e)))^n+9*ln(
F)*a*c*d^2*f*g*n*x^2+6*ln(F)*b*c^2*d*f*g*n*x*(F^(g*(f*x+e)))^n+9*
ln(F)*a*c^2*d*f*g*n*x+2*ln(F)*b*c^3*f*g*n*(F^(g*(f*x+e)))^n+3*ln(
F)*a*c^3*f*g*n-3*b*d^3*x^2*(F^(g*(f*x+e)))^n-3*a*d^3*x^2-6*b*c*d^
2*x*(F^(g*(f*x+e)))^n-6*a*c*d^2*x-3*b*c^2*d*(F^(g*(f*x+e)))^n-3*a
*c^2*d)/n^2/g^2/f^2/ln(F)^2/a^2/(a+b*(F^(g*(f*x+e)))^n)^2+3/4/g^4
/f^4/ln(F)^4/a^3*d^3*ln(F^(g*(f*x+e)))^4-6/n/g^2/f^2/ln(F)^2/a^3*
c*d^2*ln(1+b*(F^(g*(f*x+e)))^n/a)*ln(F^(g*(f*x+e)))*x-6/n/g^2/f^2
/ln(F)^2/a^3*c*d^2*ln((F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)))*x+6/n/
g^2/f^2/ln(F)^2/a^3*c*d^2*ln(a+b*(F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+
e)))*x
```

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

$$\frac{1}{2}c^3\left(\frac{2\left(F^{fgx+eg}\right)^n b+3a}{\left(2\left(F^{fgx+eg}\right)^n a^3bn+\left(F^{fgx+eg}\right)^{2n}a^2b^2n+a^4n\right)fg\log(F)}+\frac{2\log\left(F^{fgx+eg}\right)}{a^3fg\log(F)}-\frac{2\log\left(\frac{\left(F^{fgx+eg}\right)^n b+a}{b}\right)}{a^3fgn\log(F)}\right)$$
$$+\frac{3ad^3fgnx^3\log(F)-3ac^2d+3\left(3acd^2fgn\log(F)-ad^3\right)x^2+\left(2\left(F^{eg}\right)^n bd^3fgnx^3\log(F)-3\left(F^{eg}\right)^n bc^2d+3\left(2\left(F^{eg}\right)^n bcd^2\right.\right.}{2\left(2\left(F^{fgx}\right)^n\left(F^{eg}\right)^n a^3bf^2g^2n^2\log(F)^2+\left(F^{fgx}\right)^{2n}(F\right.}$$
$$+\int\frac{2d^3f^2g^2n^2x^3\log(F)^2-9c^2dfgn\log(F)+6cd^2+3\left(2cd^2f^2g^2n^2\log(F)^2-3d^3fgn\log(F)\right)x^2+6\left(c^2df^2g^2n^2\log(F)^2\right.}{2\left(\left(F^{fgx}\right)^n\left(F^{eg}\right)^n a^2bf^2g^2n^2\log(F)^2+a^3f^2g^2n^2\log(F)^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x + c)^3/((F^((f*x + e)*g))^n*b + a)^3,x, algorithm="maxima")
```

```
[Out] 1/2*c^3*((2*(F^(f*g*x + e*g))^n*b + 3*a)/((2*(F^(f*g*x + e*g))^n*
a^3*b*n + (F^(f*g*x + e*g))^(2*n)*a^2*b^2*n + a^4*n)*f*g*log(F))
+ 2*log(F^(f*g*x + e*g))/(a^3*f*g*log(F)) - 2*log(((F^(f*g*x + e*
g))^n*b + a)/b)/(a^3*f*g*n*log(F))) + 1/2*(3*a*d^3*f*g*n*x^3*log(
F) - 3*a*c^2*d + 3*(3*a*c*d^2*f*g*n*log(F) - a*d^3)*x^2 + (2*(F^(
e*g))^n*b*d^3*f*g*n*x^3*log(F) - 3*(F^(e*g))^n*b*c^2*d + 3*(2*(F^
(e*g))^n*b*c*d^2*f*g*n*log(F) - (F^(e*g))^n*b*d^3)*x^2 + 6*((F^(e
*g))^n*b*c^2*d*f*g*n*log(F) - (F^(e*g))^n*b*c*d^2)*x)*(F^(f*g*x))
^n + 3*(3*a*c^2*d*f*g*n*log(F) - 2*a*c*d^2)*x)/(2*(F^(f*g*x))^n*(
F^(e*g))^n*a^3*b*f^2*g^2*n^2*log(F)^2 + (F^(f*g*x))^(2*n)*(F^(e*g
))^(2*n)*a^2*b^2*f^2*g^2*n^2*log(F)^2 + a^4*f^2*g^2*n^2*log(F)^2)
 + integrate(1/2*(2*d^3*f^2*g^2*n^2*x^3*log(F)^2 - 9*c^2*d*f*g*n*
log(F) + 6*c*d^2 + 3*(2*c*d^2*f^2*g^2*n^2*log(F)^2 - 3*d^3*f*g*n*
log(F))*x^2 + 6*(c^2*d*f^2*g^2*n^2*log(F)^2 - 3*c*d^2*f*g*n*log(F
) + d^3)*x)/((F^(f*g*x))^n*(F^(e*g))^n*a^2*b*f^2*g^2*n^2*log(F)^2
 + a^3*f^2*g^2*n^2*log(F)^2), x)
```

Fricas [A] time = 0.284597, size = 3650, normalized size = 6.14

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x + c)^3/((F^((f*x + e)*g))^n*b + a)^3,x, algorithm="fricas")
```

```
[Out] -1/4*(6*(a^2*d^3*e^3 - 3*a^2*c*d^2*e^2*f + 3*a^2*c^2*d*e*f^2 - a^
2*c^3*f^3)*g^3*n^3*log(F)^3 + 6*(a^2*d^3*e^2 - 2*a^2*c*d^2*e*f +
a^2*c^2*d*f^2)*g^2*n^2*log(F)^2 - (a^2*d^3*f^4*g^4*n^4*x^4 + 4*a^
2*c*d^2*f^4*g^4*n^4*x^3 + 6*a^2*c^2*d*f^4*g^4*n^4*x^2 + 4*a^2*c^3
*f^4*g^4*n^4*x - (a^2*d^3*e^4 - 4*a^2*c*d^2*e^3*f + 6*a^2*c^2*d*e
^2*f^2 - 4*a^2*c^3*e*f^3)*g^4*n^4)*log(F)^4 - ((b^2*d^3*f^4*g^4*n
^4*x^4 + 4*b^2*c*d^2*f^4*g^4*n^4*x^3 + 6*b^2*c^2*d*f^4*g^4*n^4*x^
2 + 4*b^2*c^3*f^4*g^4*n^4*x - (b^2*d^3*e^4 - 4*b^2*c*d^2*e^3*f +
6*b^2*c^2*d*e^2*f^2 - 4*b^2*c^3*e*f^3)*g^4*n^4)*log(F)^4 - 6*(b^2
*d^3*f^3*g^3*n^3*x^3 + 3*b^2*c*d^2*f^3*g^3*n^3*x^2 + 3*b^2*c^2*d*
f^3*g^3*n^3*x + (b^2*d^3*e^3 - 3*b^2*c*d^2*e^2*f + 3*b^2*c^2*d*e*
f^2)*g^3*n^3)*log(F)^3 + 6*(b^2*d^3*f^2*g^2*n^2*x^2 + 2*b^2*c*d^2
*f^2*g^2*n^2*x - (b^2*d^3*e^2 - 2*b^2*c*d^2*e*f)*g^2*n^2)*log(F)^
2)*F^(2*f*g*n*x + 2*e*g*n) - 2*((a*b*d^3*f^4*g^4*n^4*x^4 + 4*a*b*
c*d^2*f^4*g^4*n^4*x^3 + 6*a*b*c^2*d*f^4*g^4*n^4*x^2 + 4*a*b*c^3*f
^4*g^4*n^4*x - (a*b*d^3*e^4 - 4*a*b*c*d^2*e^3*f + 6*a*b*c^2*d*e^2
*f^2 - 4*a*b*c^3*e*f^3)*g^4*n^4)*log(F)^4 - 2*(2*a*b*d^3*f^3*g^3*
n^3*x^3 + 6*a*b*c*d^2*f^3*g^3*n^3*x^2 + 6*a*b*c^2*d*f^3*g^3*n^3*x
 + (3*a*b*d^3*e^3 - 9*a*b*c*d^2*e^2*f + 9*a*b*c^2*d*e*f^2 - a*b*c
^3*f^3)*g^3*n^3)*log(F)^3 + 3*(a*b*d^3*f^2*g^2*n^2*x^2 + 2*a*b*c*
d^2*f^2*g^2*n^2*x - (2*a*b*d^3*e^2 - 4*a*b*c*d^2*e*f + a*b*c^2*d*
f^2)*g^2*n^2)*log(F)^2)*F^(f*g*n*x + e*g*n) + 12*(a^2*d^3 + (a^2*
d^3*f^2*g^2*n^2*x^2 + 2*a^2*c*d^2*f^2*g^2*n^2*x + a^2*c^2*d*f^2*g
^2*n^2)*log(F)^2 + (b^2*d^3 + (b^2*d^3*f^2*g^2*n^2*x^2 + 2*b^2*c*
d^2*f^2*g^2*n^2*x + b^2*c^2*d*f^2*g^2*n^2)*log(F)^2 - 3*(b^2*d^3*
f*g*n*x + b^2*c*d^2*f*g*n)*log(F))*F^(2*f*g*n*x + 2*e*g*n) + 2*(a
*b*d^3 + (a*b*d^3*f^2*g^2*n^2*x^2 + 2*a*b*c*d^2*f^2*g^2*n^2*x + a
*b*c^2*d*f^2*g^2*n^2)*log(F)^2 - 3*(a*b*d^3*f*g*n*x + a*b*c*d^2*f
*g*n)*log(F))*F^(f*g*n*x + e*g*n) - 3*(a^2*d^3*f*g*n*x + a^2*c*d^
2*f*g*n)*log(F))*dilog(-(F^(f*g*n*x + e*g*n)*b + a)/a + 1) - 2*(2
*(a^2*d^3*e^3 - 3*a^2*c*d^2*e^2*f + 3*a^2*c^2*d*e*f^2 - a^2*c^3*f
^3)*g^3*n^3*log(F)^3 + 9*(a^2*d^3*e^2 - 2*a^2*c*d^2*e*f + a^2*c^2
*d*f^2)*g^2*n^2*log(F)^2 + 6*(a^2*d^3*e - a^2*c*d^2*f)*g*n*log(F)
 + (2*(b^2*d^3*e^3 - 3*b^2*c*d^2*e^2*f + 3*b^2*c^2*d*e*f^2 - b^2*
c^3*f^3)*g^3*n^3*log(F)^3 + 9*(b^2*d^3*e^2 - 2*b^2*c*d^2*e*f + b^
2*c^2*d*f^2)*g^2*n^2*log(F)^2 + 6*(b^2*d^3*e - b^2*c*d^2*f)*g*n*l
og(F))*F^(2*f*g*n*x + 2*e*g*n) + 2*(2*(a*b*d^3*e^3 - 3*a*b*c*d^2*
e^2*f + 3*a*b*c^2*d*e*f^2 - a*b*c^3*f^3)*g^3*n^3*log(F)^3 + 9*(a*
b*d^3*e^2 - 2*a*b*c*d^2*e*f + a*b*c^2*d*f^2)*g^2*n^2*log(F)^2 + 6
*(a*b*d^3*e - a*b*c*d^2*f)*g*n*log(F))*F^(f*g*n*x + e*g*n))*log(F
^(f*g*n*x + e*g*n)*b + a) + 2*(2*(a^2*d^3*f^3*g^3*n^3*x^3 + 3*a^2
*c*d^2*f^3*g^3*n^3*x^2 + 3*a^2*c^2*d*f^3*g^3*n^3*x + (a^2*d^3*e^3
```

```
 - 3*a^2*c*d^2*e^2*f + 3*a^2*c^2*d*e*f^2)*g^3*n^3)*log(F)^3 - 9*(
a^2*d^3*f^2*g^2*n^2*x^2 + 2*a^2*c*d^2*f^2*g^2*n^2*x - (a^2*d^3*e^
2 - 2*a^2*c*d^2*e*f)*g^2*n^2)*log(F)^2 + (2*(b^2*d^3*f^3*g^3*n^3*
x^3 + 3*b^2*c*d^2*f^3*g^3*n^3*x^2 + 3*b^2*c^2*d*f^3*g^3*n^3*x + (
b^2*d^3*e^3 - 3*b^2*c*d^2*e^2*f + 3*b^2*c^2*d*e*f^2)*g^3*n^3)*log
(F)^3 - 9*(b^2*d^3*f^2*g^2*n^2*x^2 + 2*b^2*c*d^2*f^2*g^2*n^2*x -
(b^2*d^3*e^2 - 2*b^2*c*d^2*e*f)*g^2*n^2)*log(F)^2 + 6*(b^2*d^3*f*
g*n*x + b^2*d^3*e*g*n)*log(F))*F^(2*f*g*n*x + 2*e*g*n) + 2*(2*(a*
b*d^3*f^3*g^3*n^3*x^3 + 3*a*b*c*d^2*f^3*g^3*n^3*x^2 + 3*a*b*c^2*d
*f^3*g^3*n^3*x + (a*b*d^3*e^3 - 3*a*b*c*d^2*e^2*f + 3*a*b*c^2*d*e
*f^2)*g^3*n^3)*log(F)^3 - 9*(a*b*d^3*f^2*g^2*n^2*x^2 + 2*a*b*c*d^
2*f^2*g^2*n^2*x - (a*b*d^3*e^2 - 2*a*b*c*d^2*e*f)*g^2*n^2)*log(F)
^2 + 6*(a*b*d^3*f*g*n*x + a*b*d^3*e*g*n)*log(F))*F^(f*g*n*x + e*g
*n) + 6*(a^2*d^3*f*g*n*x + a^2*d^3*e*g*n)*log(F))*log((F^(f*g*n*x
 + e*g*n)*b + a)/a) + 24*(2*F^(f*g*n*x + e*g*n)*a*b*d^3 + F^(2*f*
g*n*x + 2*e*g*n)*b^2*d^3 + a^2*d^3)*polylog(4, -F^(f*g*n*x + e*g*
n)*b/a) + 12*(3*a^2*d^3 + (3*b^2*d^3 - 2*(b^2*d^3*f*g*n*x + b^2*c
*d^2*f*g*n)*log(F))*F^(2*f*g*n*x + 2*e*g*n) + 2*(3*a*b*d^3 - 2*(a
*b*d^3*f*g*n*x + a*b*c*d^2*f*g*n)*log(F))*F^(f*g*n*x + e*g*n) - 2
*(a^2*d^3*f*g*n*x + a^2*c*d^2*f*g*n)*log(F))*polylog(3, -F^(f*g*n
*x + e*g*n)*b/a))/(2*F^(f*g*n*x + e*g*n)*a^4*b*f^4*g^4*n^4*log(F)
^4 + F^(2*f*g*n*x + 2*e*g*n)*a^3*b^2*f^4*g^4*n^4*log(F)^4 + a^5*f
^4*g^4*n^4*log(F)^4)
```

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**3/(a+b*(F**(g*(f*x+e)))**n)**3,x)
```

```
[Out] (3*a*c**3*f*g*n*log(F) + 9*a*c**2*d*f*g*n*x*log(F) - 3*a*c**2*d +
 9*a*c*d**2*f*g*n*x**2*log(F) - 6*a*c*d**2*x + 3*a*d**3*f*g*n*x**
3*log(F) - 3*a*d**3*x**2 + (2*b*c**3*f*g*n*log(F) + 6*b*c**2*d*f*
g*n*x*log(F) - 3*b*c**2*d + 6*b*c*d**2*f*g*n*x**2*log(F) - 6*b*c*
d**2*x + 2*b*d**3*f*g*n*x**3*log(F) - 3*b*d**3*x**2)*(F**(g*(e +
f*x)))**n)/(2*a**4*f**2*g**2*n**2*log(F)**2 + 4*a**3*b*f**2*g**2*
n**2*(F**(g*(e + f*x)))**n*log(F)**2 + 2*a**2*b**2*f**2*g**2*n**2
*(F**(g*(e + f*x)))**(2*n)*log(F)**2) + (Integral(6*c*d**2/(a + b
*exp(e*g*n*log(F))*exp(f*g*n*x*log(F))), x) + Integral(6*d**3*x/(
a + b*exp(e*g*n*log(F))*exp(f*g*n*x*log(F))), x) + Integral(2*c**
3*f**2*g**2*n**2*log(F)**2/(a + b*exp(e*g*n*log(F))*exp(f*g*n*x*l
og(F))), x) + Integral(-9*c**2*d*f*g*n*log(F)/(a + b*exp(e*g*n*lo
g(F))*exp(f*g*n*x*log(F))), x) + Integral(-9*d**3*f*g*n*x**2*log(
F)/(a + b*exp(e*g*n*log(F))*exp(f*g*n*x*log(F))), x) + Integral(2
*d**3*f**2*g**2*n**2*x**3*log(F)**2/(a + b*exp(e*g*n*log(F))*exp(
f*g*n*x*log(F))), x) + Integral(-18*c*d**2*f*g*n*x*log(F)/(a + b*
exp(e*g*n*log(F))*exp(f*g*n*x*log(F))), x) + Integral(6*c*d**2*f*
```

```
*2*g**2*n**2*x**2*log(F)**2/(a + b*exp(e*g*n*log(F))*exp(f*g*n*x*
log(F))), x) + Integral(6*c**2*d*f**2*g**2*n**2*x*log(F)**2/(a +
b*exp(e*g*n*log(F))*exp(f*g*n*x*log(F))), x))/(2*a**2*f**2*g**2*n
**2*log(F)**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx+c)^3}{\left(\left(F^{(fx+e)g}\right)^n b+a\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^3/((F^((f*x + e)*g))^n*b + a)^3,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^3/((F^((f*x + e)*g))^n*b + a)^3, x)
```

3.59 $\int \frac{(c+dx)^2}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^3} \, dx$

Optimal. Leaf size=439

$$-\frac{2d(c+dx)\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^3f^2g^2n^2\log^2(F)}+\frac{3d^2\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^3f^3g^3n^3\log^3(F)}$$
$$+\frac{2d^2\text{PolyLog}\left(3,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^3f^3g^3n^3\log^3(F)}+\frac{3d(c+dx)\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{a^3f^2g^2n^2\log^2(F)}$$
$$-\frac{(c+dx)^2\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{a^3fgn\log(F)}-\frac{d^2\log\left(a+b\left(F^{g(e+fx)}\right)^n\right)}{a^3f^3g^3n^3\log^3(F)}-\frac{3(c+dx)^2}{2a^3fgn\log(F)}$$
$$+\frac{(c+dx)^3}{3a^3d}+\frac{d^2x}{a^3f^2g^2n^2\log^2(F)}-\frac{d(c+dx)}{a^2f^2g^2n^2\log^2(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)}$$
$$+\frac{(c+dx)^2}{a^2fgn\log(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)}+\frac{(c+dx)^2}{2afgn\log(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2}$$

```
[Out] (c + d*x)^3/(3*a^3*d) + (d^2*x)/(a^3*f^2*g^2*n^2*Log[F]^2) - (d*(
c + d*x))/(a^2*f^2*(a + b*(F^(g*(e + f*x)))^n)*g^2*n^2*Log[F]^2)
- (3*(c + d*x)^2)/(2*a^3*f*g*n*Log[F]) + (c + d*x)^2/(2*a*f*(a +
b*(F^(g*(e + f*x)))^n)^2*g*n*Log[F]) + (c + d*x)^2/(a^2*f*(a + b*
(F^(g*(e + f*x)))^n)*g*n*Log[F]) - (d^2*Log[a + b*(F^(g*(e + f*x)
))^n])/(a^3*f^3*g^3*n^3*Log[F]^3) + (3*d*(c + d*x)*Log[1 + (b*(F^
(g*(e + f*x)))^n)/a])/(a^3*f^2*g^2*n^2*Log[F]^2) - ((c + d*x)^2*L
og[1 + (b*(F^(g*(e + f*x)))^n)/a])/(a^3*f*g*n*Log[F]) + (3*d^2*Po
lyLog[2, -((b*(F^(g*(e + f*x)))^n)/a)])/(a^3*f^3*g^3*n^3*Log[F]^3
) - (2*d*(c + d*x)*PolyLog[2, -((b*(F^(g*(e + f*x)))^n)/a)])/(a^3
*f^2*g^2*n^2*Log[F]^2) + (2*d^2*PolyLog[3, -((b*(F^(g*(e + f*x)))
^n)/a)])/(a^3*f^3*g^3*n^3*Log[F]^3)
```

Rubi [A] time = 2.18456, antiderivative size = 439, normalized size of antiderivative = 1., number of

steps used = 24, number of rules used = 13, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.52

$$-\frac{2d(c+dx)\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^3f^2g^2n^2\log^2(F)}+\frac{3d^2\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^3f^3g^3n^3\log^3(F)}+\frac{2d^2\text{PolyLog}\left(3,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^3f^3g^3n^3\log^3(F)}+\frac{3d(c+dx)\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{a^3f^2g^2n^2\log^2(F)}-\frac{(c+dx)^2\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{a^3fgn\log(F)}-\frac{d^2\log\left(a+b\left(F^{g(e+fx)}\right)^n\right)}{a^3f^3g^3n^3\log^3(F)}-\frac{3(c+dx)^2}{2a^3fgn\log(F)}+\frac{(c+dx)^3}{3a^3d}+\frac{d^2x}{a^3f^2g^2n^2\log^2(F)}-\frac{d(c+dx)}{a^2f^2g^2n^2\log^2(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)}+\frac{(c+dx)^2}{a^2fgn\log(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)}+\frac{(c+dx)^2}{2afgn\log(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^2/(a + b*(F^(g*(e + f*x)))^n)^3,x]
```

```
[Out] (c + d*x)^3/(3*a^3*d) + (d^2*x)/(a^3*f^2*g^2*n^2*Log[F]^2) - (d*(
c + d*x))/(a^2*f^2*(a + b*(F^(g*(e + f*x)))^n)*g^2*n^2*Log[F]^2)
- (3*(c + d*x)^2)/(2*a^3*f*g*n*Log[F]) + (c + d*x)^2/(2*a*f*(a +
b*(F^(g*(e + f*x)))^n)^2*g*n*Log[F]) + (c + d*x)^2/(a^2*f*(a + b*
(F^(g*(e + f*x)))^n)*g*n*Log[F]) - (d^2*Log[a + b*(F^(g*(e + f*x)
))^n])/(a^3*f^3*g^3*n^3*Log[F]^3) + (3*d*(c + d*x)*Log[1 + (b*(F^
(g*(e + f*x)))^n)/a]])/(a^3*f^2*g^2*n^2*Log[F]^2) - ((c + d*x)^2*L
og[1 + (b*(F^(g*(e + f*x)))^n)/a]])/(a^3*f*g*n*Log[F]) + (3*d^2*Po
lyLog[2, -((b*(F^(g*(e + f*x)))^n)/a)]])/(a^3*f^3*g^3*n^3*Log[F]^3
) - (2*d*(c + d*x)*PolyLog[2, -((b*(F^(g*(e + f*x)))^n)/a)]])/(a^3
*f^2*g^2*n^2*Log[F]^2) + (2*d^2*PolyLog[3, -((b*(F^(g*(e + f*x)))
^n)/a)]])/(a^3*f^3*g^3*n^3*Log[F]^3)
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**2/(a+b*(F**(g*(f*x+e)))**n)**3,x)
```

```
[Out] Timed out
```

Mathematica [A] time = 3.53597, size = 0, normalized size = 0.

$$\int \frac{(c+dx)^2}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^3}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(c + d*x)^2/(a + b*(F^(g*(e + f*x)))^n)^3,x]
```

```
[Out] Integrate[(c + d*x)^2/(a + b*(F^(g*(e + f*x)))^n)^3, x]
```

Maple [B] time = 0.053, size = 1457, normalized size = 3.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^2/(a+b*(F^(g*(f*x+e)))^n)^3,x)
```

```
[Out] -3/2/n/g^3/f^3/ln(F)^3/a^3*d^2*ln(F^(g*(f*x+e)))^2-1/n/g/f/ln(F)/
a^3*c^2*ln(a+b*(F^(g*(f*x+e)))^n)+1/n^3/g^3/f^3/ln(F)^3/a^3*d^2*l
n((F^(g*(f*x+e)))^n)+1/n/g/f/ln(F)/a^3*c^2*ln((F^(g*(f*x+e)))^n)+
1/g^2/f^2/ln(F)^2/a^3*d*c*ln(F^(g*(f*x+e)))^2+1/g^2/f^2/ln(F)^2/a
^3*d^2*ln(F^(g*(f*x+e)))^2*x-d^2*ln(a+b*(F^(g*(f*x+e)))^n)/a^3/f^
3/g^3/n^3/ln(F)^3+3*d^2*polylog(2,-b*(F^(g*(f*x+e)))^n/a)/a^3/f^3
/g^3/n^3/ln(F)^3+2*d^2*polylog(3,-b*(F^(g*(f*x+e)))^n/a)/a^3/f^3/
g^3/n^3/ln(F)^3+1/2*(2*ln(F)*b*d^2*f*g*n*x^2*(F^(g*(f*x+e)))^n+3*
ln(F)*a*d^2*f*g*n*x^2+4*ln(F)*b*c*d*f*g*n*x*(F^(g*(f*x+e)))^n+6*l
n(F)*a*c*d*f*g*n*x+2*ln(F)*b*c^2*f*g*n*(F^(g*(f*x+e)))^n+3*ln(F)*
a*c^2*f*g*n-2*b*d^2*x*(F^(g*(f*x+e)))^n-2*a*d^2*x-2*b*c*d*(F^(g*(
f*x+e)))^n-2*a*c*d)/n^2/g^2/f^2/ln(F)^2/a^2/(a+b*(F^(g*(f*x+e)))^
n)^2+1/n/g^3/f^3/ln(F)^3/a^3*d^2*ln((F^(g*(f*x+e)))^n)*ln(F^(g*(f
*x+e)))^2-3/n^2/g^3/f^3/ln(F)^3/a^3*d^2*ln(a+b*(F^(g*(f*x+e)))^n)
*ln(F^(g*(f*x+e)))+3/n^2/g^3/f^3/ln(F)^3/a^3*d^2*ln(1+b*(F^(g*(f*
x+e)))^n/a)*ln(F^(g*(f*x+e)))-3/n^2/g^2/f^2/ln(F)^2/a^3*d^2*ln((F
^(g*(f*x+e)))^n)*x+3/n^2/g^3/f^3/ln(F)^3/a^3*d^2*ln((F^(g*(f*x+e)
))^n)*ln(F^(g*(f*x+e)))+3/n^2/g^2/f^2/ln(F)^2/a^3*d^2*ln(a+b*(F^(
g*(f*x+e)))^n)*x-2/n^2/g^2/f^2/ln(F)^2/a^3*c*d*polylog(2,-b*(F^(g
*(f*x+e)))^n/a)-3/n^2/g^2/f^2/ln(F)^2/a^3*c*d*ln((F^(g*(f*x+e)))^
n)-2/n^2/g^2/f^2/ln(F)^2/a^3*d^2*polylog(2,-b*(F^(g*(f*x+e)))^n/a
)*x+3/n^2/g^2/f^2/ln(F)^2/a^3*c*d*ln(a+b*(F^(g*(f*x+e)))^n)+1/n/g
^3/f^3/ln(F)^3/a^3*d^2*ln(1+b*(F^(g*(f*x+e)))^n/a)*ln(F^(g*(f*x+e
)))^2-1/n/g/f/ln(F)/a^3*d^2*ln(a+b*(F^(g*(f*x+e)))^n)*x^2-1/n/g^3
/f^3/ln(F)^3/a^3*d^2*ln(a+b*(F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)))^
2+1/n/g/f/ln(F)/a^3*d^2*ln((F^(g*(f*x+e)))^n)*x^2-2/3/g^3/f^3/ln(
```

```
F)^3/a^3*d^2*ln(F^(g*(f*x+e)))^3+2/n/g/f/ln(F)/a^3*c*d*ln((F^(g*(
f*x+e)))^n)*x-2/n/g/f/ln(F)/a^3*c*d*ln(a+b*(F^(g*(f*x+e)))^n)*x-2
/n/g^2/f^2/ln(F)^2/a^3*d^2*ln(1+b*(F^(g*(f*x+e)))^n/a)*ln(F^(g*(f
*x+e)))*x+2/n/g^2/f^2/ln(F)^2/a^3*d^2*ln(a+b*(F^(g*(f*x+e)))^n)*l
n(F^(g*(f*x+e)))*x-2/n/g^2/f^2/ln(F)^2/a^3*d^2*ln((F^(g*(f*x+e)))
^n)*ln(F^(g*(f*x+e)))*x-2/n/g^2/f^2/ln(F)^2/a^3*c*d*ln(1+b*(F^(g*
(f*x+e)))^n/a)*ln(F^(g*(f*x+e)))-2/n/g^2/f^2/ln(F)^2/a^3*c*d*ln((
F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)))+2/n/g^2/f^2/ln(F)^2/a^3*c*d*l
n(a+b*(F^(g*(f*x+e)))^n)*ln(F^(g*(f*x+e)))
```

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

$$\frac{1}{2}c^2\left(\frac{2\left(F^{fgx+eg}\right)^n b+3a}{\left(2\left(F^{fgx+eg}\right)^n a^3bn+\left(F^{fgx+eg}\right)^{2n}a^2b^2n+a^4n\right)fg\log(F)}+\frac{2\log\left(F^{fgx+eg}\right)}{a^3fg\log(F)}-\frac{2\log\left(\frac{\left(F^{fgx+eg}\right)^n b+a}{b}\right)}{a^3fgn\log(F)}\right)$$
$$+\frac{3ad^2fgnx^2\log(F)-2acd+2\left((F^{eg})^n bd^2fgnx^2\log(F)-(F^{eg})^n bcd+\left(2(F^{eg})^n bcdfgn\log(F)-(F^{eg})^n bd^2\right)x\right)\left(F^{fgx}\right)^n+}{2\left(2\left(F^{fgx}\right)^n(F^{eg})^n a^3bf^2g^2n^2\log(F)^2+\left(F^{fgx}\right)^{2n}(F^{eg})^{2n}a^2b^2f^2g^2n^2\log(F)^2+a^4f^2g^2n^2\log(F)\right.}$$
$$+\int\frac{d^2f^2g^2n^2x^2\log(F)^2-3cdfgn\log(F)+d^2+\left(2cdf^2g^2n^2\log(F)^2-3d^2fgn\log(F)\right)x}{\left(F^{fgx}\right)^n(F^{eg})^n a^2bf^2g^2n^2\log(F)^2+a^3f^2g^2n^2\log(F)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x + c)^2/((F^((f*x + e)*g))^n*b + a)^3,x, algorithm="maxima")
```

```
[Out] 1/2*c^2*((2*(F^(f*g*x + e*g))^n*b + 3*a)/((2*(F^(f*g*x + e*g))^n*
a^3*b*n + (F^(f*g*x + e*g))^(2*n)*a^2*b^2*n + a^4*n)*f*g*log(F))
+ 2*log(F^(f*g*x + e*g))/(a^3*f*g*log(F)) - 2*log(((F^(f*g*x + e*
g))^n*b + a)/b)/(a^3*f*g*n*log(F))) + 1/2*(3*a*d^2*f*g*n*x^2*log(
F) - 2*a*c*d + 2*((F^(e*g))^n*b*d^2*f*g*n*x^2*log(F) - (F^(e*g))^
n*b*c*d + (2*(F^(e*g))^n*b*c*d*f*g*n*log(F) - (F^(e*g))^n*b*d^2)*
x)*(F^(f*g*x))^n + 2*(3*a*c*d*f*g*n*log(F) - a*d^2)*x)/(2*(F^(f*g
*x))^n*(F^(e*g))^n*a^3*b*f^2*g^2*n^2*log(F)^2 + (F^(f*g*x))^(2*n)
*(F^(e*g))^(2*n)*a^2*b^2*f^2*g^2*n^2*log(F)^2 + a^4*f^2*g^2*n^2*l
og(F)^2) + integrate((d^2*f^2*g^2*n^2*x^2*log(F)^2 - 3*c*d*f*g*n*
log(F) + d^2 + (2*c*d*f^2*g^2*n^2*log(F)^2 - 3*d^2*f*g*n*log(F))*
x)/((F^(f*g*x))^n*(F^(e*g))^n*a^2*b*f^2*g^2*n^2*log(F)^2 + a^3*f^
2*g^2*n^2*log(F)^2), x)
```

Fricas [A] time = 0.269916, size = 2049, normalized size = 4.67

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^2/((F^((f*x + e)*g))^n*b + a)^3,x, algorithm="fricas")
```

```
[Out] 1/6*(9*(a^2*d^2*e^2 - 2*a^2*c*d*e*f + a^2*c^2*f^2)*g^2*n^2*log(F)
^2 + 6*(a^2*d^2*e - a^2*c*d*f)*g*n*log(F) + 2*(a^2*d^2*f^3*g^3*n^
3*x^3 + 3*a^2*c*d*f^3*g^3*n^3*x^2 + 3*a^2*c^2*f^3*g^3*n^3*x + (a^
2*d^2*e^3 - 3*a^2*c*d*e^2*f + 3*a^2*c^2*e*f^2)*g^3*n^3)*log(F)^3
+ (2*(b^2*d^2*f^3*g^3*n^3*x^3 + 3*b^2*c*d*f^3*g^3*n^3*x^2 + 3*b^2
*c^2*f^3*g^3*n^3*x + (b^2*d^2*e^3 - 3*b^2*c*d*e^2*f + 3*b^2*c^2*e
*f^2)*g^3*n^3)*log(F)^3 - 9*(b^2*d^2*f^2*g^2*n^2*x^2 + 2*b^2*c*d*
f^2*g^2*n^2*x - (b^2*d^2*e^2 - 2*b^2*c*d*e*f)*g^2*n^2)*log(F)^2 +
 6*(b^2*d^2*f*g*n*x + b^2*d^2*e*g*n)*log(F))*F^(2*f*g*n*x + 2*e*g
*n) + 2*(2*(a*b*d^2*f^3*g^3*n^3*x^3 + 3*a*b*c*d*f^3*g^3*n^3*x^2 +
 3*a*b*c^2*f^3*g^3*n^3*x + (a*b*d^2*e^3 - 3*a*b*c*d*e^2*f + 3*a*b
*c^2*e*f^2)*g^3*n^3)*log(F)^3 - 3*(2*a*b*d^2*f^2*g^2*n^2*x^2 + 4*
a*b*c*d*f^2*g^2*n^2*x - (3*a*b*d^2*e^2 - 6*a*b*c*d*e*f + a*b*c^2*
f^2)*g^2*n^2)*log(F)^2 + 3*(a*b*d^2*f*g*n*x + (2*a*b*d^2*e - a*b*
c*d*f)*g*n)*log(F))*F^(f*g*n*x + e*g*n) + 6*(3*a^2*d^2 + (3*b^2*d
^2 - 2*(b^2*d^2*f*g*n*x + b^2*c*d*f*g*n)*log(F))*F^(2*f*g*n*x + 2
*e*g*n) + 2*(3*a*b*d^2 - 2*(a*b*d^2*f*g*n*x + a*b*c*d*f*g*n)*log(
F))*F^(f*g*n*x + e*g*n) - 2*(a^2*d^2*f*g*n*x + a^2*c*d*f*g*n)*log
(F))*dilog(-(F^(f*g*n*x + e*g*n)*b + a)/a + 1) - 6*((a^2*d^2*e^2
- 2*a^2*c*d*e*f + a^2*c^2*f^2)*g^2*n^2*log(F)^2 + a^2*d^2 + 3*(a^
2*d^2*e - a^2*c*d*f)*g*n*log(F) + ((b^2*d^2*e^2 - 2*b^2*c*d*e*f +
 b^2*c^2*f^2)*g^2*n^2*log(F)^2 + b^2*d^2 + 3*(b^2*d^2*e - b^2*c*d
*f)*g*n*log(F))*F^(2*f*g*n*x + 2*e*g*n) + 2*((a*b*d^2*e^2 - 2*a*b
*c*d*e*f + a*b*c^2*f^2)*g^2*n^2*log(F)^2 + a*b*d^2 + 3*(a*b*d^2*e
 - a*b*c*d*f)*g*n*log(F))*F^(f*g*n*x + e*g*n))*log(F^(f*g*n*x + e
*g*n)*b + a) - 6*((a^2*d^2*f^2*g^2*n^2*x^2 + 2*a^2*c*d*f^2*g^2*n^
2*x - (a^2*d^2*e^2 - 2*a^2*c*d*e*f)*g^2*n^2)*log(F)^2 + ((b^2*d^2
*f^2*g^2*n^2*x^2 + 2*b^2*c*d*f^2*g^2*n^2*x - (b^2*d^2*e^2 - 2*b^2
*c*d*e*f)*g^2*n^2)*log(F)^2 - 3*(b^2*d^2*f*g*n*x + b^2*d^2*e*g*n)
*log(F))*F^(2*f*g*n*x + 2*e*g*n) + 2*((a*b*d^2*f^2*g^2*n^2*x^2 +
2*a*b*c*d*f^2*g^2*n^2*x - (a*b*d^2*e^2 - 2*a*b*c*d*e*f)*g^2*n^2)*
log(F)^2 - 3*(a*b*d^2*f*g*n*x + a*b*d^2*e*g*n)*log(F))*F^(f*g*n*x
 + e*g*n) - 3*(a^2*d^2*f*g*n*x + a^2*d^2*e*g*n)*log(F))*log((F^(f
*g*n*x + e*g*n)*b + a)/a) + 12*(2*F^(f*g*n*x + e*g*n)*a*b*d^2 + F
^(2*f*g*n*x + 2*e*g*n)*b^2*d^2 + a^2*d^2)*polylog(3, -F^(f*g*n*x
+ e*g*n)*b/a))/(2*F^(f*g*n*x + e*g*n)*a^4*b*f^3*g^3*n^3*log(F)^3
+ F^(2*f*g*n*x + 2*e*g*n)*a^3*b^2*f^3*g^3*n^3*log(F)^3 + a^5*f^3*
g^3*n^3*log(F)^3)
```

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

$$\frac{3ac^2fgn\log{(F)}+6acdfgnx\log{(F)}-2acd+3ad^2fgnx^2\log{(F)}-2ad^2x+\left(2bc^2fgn\log{(F)}+4bcdfgnx\log{(F)}-2bcd+2\right.}{2a^4f^2g^2n^2\log{(F)}^2+4a^3bf^2g^2n^2\left(F^{g(e+fx)}\right)^n\log{(F)}^2+2a^2b^2f^2g^2n^2\left(F^{g(e+fx)}\right)^{2n}\log{(}}$$
$$+\frac{\int\frac{d^2}{a+be^{egn\log{(F)}}e^{fgnx\log{(F)}}}\,dx+\int\frac{c^2f^2g^2n^2\log{(F)}^2}{a+be^{egn\log{(F)}}e^{fgnx\log{(F)}}}\,dx+\int\left(-\frac{3cdfgn\log{(F)}}{a+be^{egn\log{(F)}}e^{fgnx\log{(F)}}}\right)dx+\int\left(-\frac{3d^2fgnx\log{(F)}}{a+be^{egn\log{(F)}}e^{fgnx\log{(F)}}}\right)dx\,+}{a^2f^2g^2n^2\log{(F)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**2/(a+b*(F**(g*(f*x+e)))**n)**3,x)
```

```
[Out] (3*a*c**2*f*g*n*log(F) + 6*a*c*d*f*g*n*x*log(F) - 2*a*c*d + 3*a*d
**2*f*g*n*x**2*log(F) - 2*a*d**2*x + (2*b*c**2*f*g*n*log(F) + 4*b
*c*d*f*g*n*x*log(F) - 2*b*c*d + 2*b*d**2*f*g*n*x**2*log(F) - 2*b*
d**2*x)*(F**(g*(e + f*x)))**n)/(2*a**4*f**2*g**2*n**2*log(F)**2 +
 4*a**3*b*f**2*g**2*n**2*(F**(g*(e + f*x)))**n*log(F)**2 + 2*a**2
*b**2*f**2*g**2*n**2*(F**(g*(e + f*x)))**(2*n)*log(F)**2) + (Inte
gral(d**2/(a + b*exp(e*g*n*log(F))*exp(f*g*n*x*log(F))), x) + Int
egral(c**2*f**2*g**2*n**2*log(F)**2/(a + b*exp(e*g*n*log(F))*exp(
f*g*n*x*log(F))), x) + Integral(-3*c*d*f*g*n*log(F)/(a + b*exp(e*
g*n*log(F))*exp(f*g*n*x*log(F))), x) + Integral(-3*d**2*f*g*n*x*l
og(F)/(a + b*exp(e*g*n*log(F))*exp(f*g*n*x*log(F))), x) + Integra
l(d**2*f**2*g**2*n**2*x**2*log(F)**2/(a + b*exp(e*g*n*log(F))*exp
(f*g*n*x*log(F))), x) + Integral(2*c*d*f**2*g**2*n**2*x*log(F)**2
/(a + b*exp(e*g*n*log(F))*exp(f*g*n*x*log(F))), x))/(a**2*f**2*g*
*2*n**2*log(F)**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(dx+c)^2}{\left(\left(F^{(fx+e)g}\right)^nb+a\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x + c)^2/((F^((f*x + e)*g))^n*b + a)^3,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^2/((F^((f*x + e)*g))^n*b + a)^3, x)
```

3.60 $\int \frac{c+dx}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^3}\,dx$

Optimal. Leaf size=276

$$-\frac{d\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^3f^2g^2n^2\log^2(F)}-\frac{(c+dx)\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{a^3fgn\log(F)}+\frac{3d\log\left(a+b\left(F^{g(e+fx)}\right)^n\right)}{2a^3f^2g^2n^2\log^2(F)}+\frac{(c+dx)^2}{2a^3d}-\frac{3dx}{2a^3fgn\log(F)}+\frac{c+dx}{a^2fgn\log(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)}-\frac{d}{2a^2f^2g^2n^2\log^2(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)}+\frac{c+dx}{2afgn\log(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2}$$

```
[Out] (c + d*x)^2/(2*a^3*d) - d/(2*a^2*f^2*(a + b*(F^(g*(e + f*x)))^n)*
g^2*n^2*Log[F]^2) - (3*d*x)/(2*a^3*f*g*n*Log[F]) + (c + d*x)/(2*a
*f*(a + b*(F^(g*(e + f*x)))^n)^2*g*n*Log[F]) + (c + d*x)/(a^2*f*(
a + b*(F^(g*(e + f*x)))^n)*g*n*Log[F]) + (3*d*Log[a + b*(F^(g*(e
+ f*x)))^n])/(2*a^3*f^2*g^2*n^2*Log[F]^2) - ((c + d*x)*Log[1 + (b
*(F^(g*(e + f*x)))^n)/a])/(a^3*f*g*n*Log[F]) - (d*PolyLog[2, -((b
*(F^(g*(e + f*x)))^n)/a)])/(a^3*f^2*g^2*n^2*Log[F]^2)
```

Rubi [A] time = 0.954306, antiderivative size = 276, normalized size of antiderivative = 1., number of steps used = 17, number of rules used = 12, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.522

$$-\frac{d\text{PolyLog}\left(2,-\frac{b\left(F^{g(e+fx)}\right)^n}{a}\right)}{a^3f^2g^2n^2\log^2(F)}-\frac{(c+dx)\log\left(\frac{b\left(F^{g(e+fx)}\right)^n}{a}+1\right)}{a^3fgn\log(F)}+\frac{3d\log\left(a+b\left(F^{g(e+fx)}\right)^n\right)}{2a^3f^2g^2n^2\log^2(F)}+\frac{(c+dx)^2}{2a^3d}-\frac{3dx}{2a^3fgn\log(F)}+\frac{c+dx}{a^2fgn\log(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)}-\frac{d}{2a^2f^2g^2n^2\log^2(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)}+\frac{c+dx}{2afgn\log(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)/(a + b*(F^(g*(e + f*x)))^n)^3,x]
```


```
[Out] (c + d*x)^2/(2*a^3*d) - d/(2*a^2*f^2*(a + b*(F^(g*(e + f*x)))^n)*
g^2*n^2*Log[F]^2) - (3*d*x)/(2*a^3*f*g*n*Log[F]) + (c + d*x)/(2*a
*f*(a + b*(F^(g*(e + f*x)))^n)^2*g*n*Log[F]) + (c + d*x)/(a^2*f*(
a + b*(F^(g*(e + f*x)))^n)*g*n*Log[F]) + (3*d*Log[a + b*(F^(g*(e
+ f*x)))^n])/(2*a^3*f^2*g^2*n^2*Log[F]^2) - ((c + d*x)*Log[1 + (b
*(F^(g*(e + f*x)))^n)/a])/(a^3*f*g*n*Log[F]) - (d*PolyLog[2, -((b
```

```
*(F^(g*(e + f*x)))^n)/a)])/(a^3*f^2*g^2*n^2*Log[F]^2)
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)/(a+b*(F**(g*(f*x+e)))**n)**3,x)

[Out] Timed out
```

Mathematica [A] time = 90.3602, size = 0, normalized size = 0.

$$\int \frac{c + dx}{\left(a + b\left(F^{g(e+fx)}\right)^n\right)^3} \, dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(c + d*x)/(a + b*(F^(g*(e + f*x)))^n)^3,x]

[Out] Integrate[(c + d*x)/(a + b*(F^(g*(e + f*x)))^n)^3, x]
```

Maple [A] time = 0.039, size = 514, normalized size = 1.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)/(a+b*(F^(g*(f*x+e)))^n)^3,x)

[Out] 1/2*(2*(F^(g*(f*x+e)))^n*ln(F)*b*d*f*g*n*x+3*ln(F)*a*d*f*g*n*x+2*
(F^(g*(f*x+e)))^n*ln(F)*b*c*f*g*n+3*c*ln(F)*a*f*g*n-(F^(g*(f*x+e)
))^n*b*d-a*d)/n^2/g^2/f^2/ln(F)^2/a^2/(a+b*(F^(g*(f*x+e)))^n)^2-3
/2/a^3/n^2/g^2/f^2/ln(F)^2*d*ln((F^(g*(f*x+e)))^n)+3/2*d*ln(a+b*(
F^(g*(f*x+e)))^n)/a^3/f^2/g^2/n^2/ln(F)^2-d*polylog(2,-b*(F^(g*(f
*x+e)))^n/a)/a^3/f^2/g^2/n^2/ln(F)^2-1/a^3/n/g^2/f^2/ln(F)^2*d*ln
(1+b*(F^(g*(f*x+e)))^n/a)*ln(F^(g*(f*x+e)))+1/a^3/n/g/f/ln(F)*d*l
n((F^(g*(f*x+e)))^n)*x-1/a^3/n/g^2/f^2/ln(F)^2*d*ln((F^(g*(f*x+e)
```

```
))^n)*ln(F^(g*(f*x+e)))-1/a^3/n/g/f/ln(F)*d*ln(a+b*(F^(g*(f*x+e))
)^n)*x+1/a^3/n/g^2/f^2/ln(F)^2*d*ln(a+b*(F^(g*(f*x+e)))^n)*ln(F^(
g*(f*x+e)))+1/2/a^3/g^2/f^2/ln(F)^2*d*ln(F^(g*(f*x+e)))^2+1/a^3/n
/g/f/ln(F)*c*ln((F^(g*(f*x+e)))^n)-1/a^3/n/g/f/ln(F)*c*ln(a+b*(F^
(g*(f*x+e)))^n)
```

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

$$\frac{1}{2}d\left(\frac{3\,afgnx\log(F)+(2\,(F^{eg})^{n}bfgnx\log(F)-(F^{eg})^{n}b)\left(F^{fgx}\right)^{n}-a}{2\left(F^{fgx}\right)^{n}(F^{eg})^{n}a^{3}bf^{2}g^{2}n^{2}\log(F)^{2}+\left(F^{fgx}\right)^{2n}(F^{eg})^{2n}a^{2}b^{2}f^{2}g^{2}n^{2}\log(F)^{2}+a^{4}f^{2}g^{2}n^{2}\log(F)^{2}}+2\int\frac{2}{2\left(\left(F^{fgx}\right)^{n}(F^{eg})\right.}\right.$$

$$+\frac{1}{2}c\left(\frac{2\left(F^{fgx+eg}\right)^{n}b+3\,a}{\left(2\left(F^{fgx+eg}\right)^{n}a^{3}bn+\left(F^{fgx+eg}\right)^{2n}a^{2}b^{2}n+a^{4}n\right)fg\log(F)}+\frac{2\,\log\left(F^{fgx+eg}\right)}{a^{3}fg\log(F)}-\frac{2\,\log\left(\frac{\left(F^{fgx+eg}\right)^{n}b+a}{b}\right)}{a^{3}fgn\log(F)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x + c)/((F^((f*x + e)*g))^n*b + a)^3,x, algorithm="maxima")
```

```
[Out] 1/2*d*((3*a*f*g*n*x*log(F) + (2*(F^(e*g))^n*b*f*g*n*x*log(F) - (F
^(e*g))^n*b)*(F^(f*g*x))^n - a)/(2*(F^(f*g*x))^n*(F^(e*g))^n*a^3*
b*f^2*g^2*n^2*log(F)^2 + (F^(f*g*x))^(2*n)*(F^(e*g))^(2*n)*a^2*b^
2*f^2*g^2*n^2*log(F)^2 + a^4*f^2*g^2*n^2*log(F)^2) + 2*integrate(
1/2*(2*f*g*n*x*log(F) - 3)/((F^(f*g*x))^n*(F^(e*g))^n*a^2*b*f*g*n
*log(F) + a^3*f*g*n*log(F)), x)) + 1/2*c*((2*(F^(f*g*x + e*g))^n*
b + 3*a)/((2*(F^(f*g*x + e*g))^n*a^3*b*n + (F^(f*g*x + e*g))^(2*n
)*a^2*b^2*n + a^4*n)*f*g*log(F)) + 2*log(F^(f*g*x + e*g))/(a^3*f*
g*log(F)) - 2*log(((F^(f*g*x + e*g))^n*b + a)/b)/(a^3*f*g*n*log(F
)))
```

Fricas [A] time = 0.252057, size = 940, normalized size = 3.41

$$-\frac{3\left(a^{2}de-a^{2}cf\right)gn\log(F)+a^{2}d-\left(a^{2}df^{2}g^{2}n^{2}x^{2}+2\,a^{2}cf^{2}g^{2}n^{2}x-\left(a^{2}de^{2}-2\,a^{2}cef\right)g^{2}n^{2}\right)\log(F)^{2}-\left(\left(b^{2}df^{2}g^{2}n^{2}x^{2}+2\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x + c)/((F^((f*x + e)*g))^n*b + a)^3,x, algorithm="fricas")
```

```
[Out] -1/2*(3*(a^2*d*e - a^2*c*f)*g*n*log(F) + a^2*d - (a^2*d*f^2*g^2*n
^2*x^2 + 2*a^2*c*f^2*g^2*n^2*x - (a^2*d*e^2 - 2*a^2*c*e*f)*g^2*n^
```

```
2)*log(F)^2 - ((b^2*d*f^2*g^2*n^2*x^2 + 2*b^2*c*f^2*g^2*n^2*x - (
b^2*d*e^2 - 2*b^2*c*e*f)*g^2*n^2)*log(F)^2 - 3*(b^2*d*f*g*n*x + b
^2*d*e*g*n)*log(F))*F^(2*f*g*n*x + 2*e*g*n) + (a*b*d - 2*(a*b*d*f
^2*g^2*n^2*x^2 + 2*a*b*c*f^2*g^2*n^2*x - (a*b*d*e^2 - 2*a*b*c*e*f
)*g^2*n^2)*log(F)^2 + 2*(2*a*b*d*f*g*n*x + (3*a*b*d*e - a*b*c*f)*
g*n)*log(F))*F^(f*g*n*x + e*g*n) + 2*(2*F^(f*g*n*x + e*g*n)*a*b*d
 + F^(2*f*g*n*x + 2*e*g*n)*b^2*d + a^2*d)*dilog(-(F^(f*g*n*x + e*
g*n)*b + a)/a + 1) - (2*(a^2*d*e - a^2*c*f)*g*n*log(F) + 3*a^2*d
+ (2*(b^2*d*e - b^2*c*f)*g*n*log(F) + 3*b^2*d)*F^(2*f*g*n*x + 2*e
*g*n) + 2*(2*(a*b*d*e - a*b*c*f)*g*n*log(F) + 3*a*b*d)*F^(f*g*n*x
 + e*g*n))*log(F^(f*g*n*x + e*g*n)*b + a) + 2*((b^2*d*f*g*n*x + b
^2*d*e*g*n)*F^(2*f*g*n*x + 2*e*g*n)*log(F) + 2*(a*b*d*f*g*n*x + a
*b*d*e*g*n)*F^(f*g*n*x + e*g*n)*log(F) + (a^2*d*f*g*n*x + a^2*d*e
*g*n)*log(F))*log((F^(f*g*n*x + e*g*n)*b + a)/a))/(2*F^(f*g*n*x +
 e*g*n)*a^4*b*f^2*g^2*n^2*log(F)^2 + F^(2*f*g*n*x + 2*e*g*n)*a^3*
b^2*f^2*g^2*n^2*log(F)^2 + a^5*f^2*g^2*n^2*log(F)^2)
```

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

$$\frac{3acfgn\log(F) + 3adfgnx\log(F) - ad + (2bcfgn\log(F) + 2bdfgnx\log(F) - bd)\left(F^{g(e+fx)}\right)^{n}}{2a^4f^2g^2n^2\log(F)^2 + 4a^3bf^2g^2n^2\left(F^{g(e+fx)}\right)^{n}\log(F)^2 + 2a^2b^2f^2g^2n^2\left(F^{g(e+fx)}\right)^{2n}\log(F)^2} + \frac{\int\left(-\frac{3d}{a+be^{egn\log(F)}e^{fgnx\log(F)}}\right)dx + \int\frac{2cfgn\log(F)}{a+be^{egn\log(F)}e^{fgnx\log(F)}}\,dx + \int\frac{2dfgnx\log(F)}{a+be^{egn\log(F)}e^{fgnx\log(F)}}\,dx}{2a^2fgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)/(a+b*(F**(g*(f*x+e)))**n)**3,x)
```

```
[Out] (3*a*c*f*g*n*log(F) + 3*a*d*f*g*n*x*log(F) - a*d + (2*b*c*f*g*n*l
og(F) + 2*b*d*f*g*n*x*log(F) - b*d)*(F**(g*(e + f*x)))**n)/(2*a**
4*f**2*g**2*n**2*log(F)**2 + 4*a**3*b*f**2*g**2*n**2*(F**(g*(e +
f*x)))**n*log(F)**2 + 2*a**2*b**2*f**2*g**2*n**2*(F**(g*(e + f*x)
))**(2*n)*log(F)**2) + (Integral(-3*d/(a + b*exp(e*g*n*log(F))*ex
p(f*g*n*x*log(F))), x) + Integral(2*c*f*g*n*log(F)/(a + b*exp(e*g
*n*log(F))*exp(f*g*n*x*log(F))), x) + Integral(2*d*f*g*n*x*log(F)
/(a + b*exp(e*g*n*log(F))*exp(f*g*n*x*log(F))), x))/(2*a**2*f*g*n
*log(F))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{dx + c}{\left(\left(F^{(fx+e)g}\right)^{n}b + a\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)/((F^((f*x + e)*g))^n*b + a)^3,x, algorithm="giac")

[Out] integrate((d*x + c)/((F^((f*x + e)*g))^n*b + a)^3, x)
```

3.61 $\int \frac{1}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^3} dx$

Optimal. Leaf size=111

$$-\frac{\log\left(a+b\left(F^{g(e+fx)}\right)^n\right)}{a^3fgn\log(F)}+\frac{x}{a^3}+\frac{1}{a^2fgn\log(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)}+\frac{1}{2afgn\log(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2}$$

```
[Out] x/a^3 + 1/(2*a*f*(a + b*(F^(g*(e + f*x)))^n)^2*g*n*Log[F]) + 1/(a
^2*f*(a + b*(F^(g*(e + f*x)))^n)*g*n*Log[F]) - Log[a + b*(F^(g*(e
 + f*x)))^n]/(a^3*f*g*n*Log[F])
```

Rubi [A] time = 0.141795, antiderivative size = 111, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176

$$-\frac{\log\left(a+b\left(F^{g(e+fx)}\right)^n\right)}{a^3fgn\log(F)}+\frac{x}{a^3}+\frac{1}{a^2fgn\log(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)}+\frac{1}{2afgn\log(F)\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)^(-3),x]
```

```
[Out] x/a^3 + 1/(2*a*f*(a + b*(F^(g*(e + f*x)))^n)^2*g*n*Log[F]) + 1/(a
^2*f*(a + b*(F^(g*(e + f*x)))^n)*g*n*Log[F]) - Log[a + b*(F^(g*(e
 + f*x)))^n]/(a^3*f*g*n*Log[F])
```

Rubi in Sympy [A] time = 24.563, size = 105, normalized size = 0.95

$$\frac{1}{2afgn\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2\log(F)}+\frac{1}{a^2fgn\left(a+b\left(F^{g(e+fx)}\right)^n\right)\log(F)}-\frac{\log\left(a+b\left(F^{g(e+fx)}\right)^n\right)}{a^3fgn\log(F)}+\frac{\log\left(\left(F^{g(e+fx)}\right)^n\right)}{a^3fgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*(F**(g*(f*x+e)))**n)**3,x)
```

```
[Out] 1/(2*a*f*g*n*(a + b*(F**(g*(e + f*x)))**n)**2*log(F)) + 1/(a**2*f
*g*n*(a + b*(F**(g*(e + f*x)))**n)*log(F)) - log(a + b*(F**(g*(e
```

```
+ f*x)))**n)/(a**3*f*g*n*log(F)) + log((F**(g*(e + f*x)))**n)/(a*
*3*f*g*n*log(F))
```

Mathematica [A] time = 0.339853, size = 97, normalized size = 0.87

$$\frac{\frac{\frac{a^2}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2}-2\log\left(a+b\left(F^{g(e+fx)}\right)^n\right)}{fgn\log(F)}+2\left(\frac{a}{afgn\log(F)+bfgn\log(F)\left(F^{eg+fgx}\right)^n}+x\right)}{2a^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)^(-3),x]
```

```
[Out] (2*(x + a/(a*f*g*n*Log[F] + b*f*(F^(e*g + f*g*x))^n*g*n*Log[F]))
+ (a^2/(a + b*(F^(g*(e + f*x)))^n)^2 - 2*Log[a + b*(F^(g*(e + f*x
)))^n])/(f*g*n*Log[F]))/(2*a^3)
```

Maple [A] time = 0.004, size = 134, normalized size = 1.2

$$\frac{\ln\left(\left(F^{g(fx+e)}\right)^n\right)}{ngf\ln(F)a^3}-\frac{\ln\left(a+b\left(F^{g(fx+e)}\right)^n\right)}{ngf\ln(F)a^3}+\frac{1}{a^2f\left(a+b\left(F^{g(fx+e)}\right)^n\right)gn\ln(F)}+\frac{1}{2af\left(a+b\left(F^{g(fx+e)}\right)^n\right)^2gn\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*(F^(g*(f*x+e)))^n)^3,x)
```

```
[Out] 1/g/f/ln(F)/n/a^3*ln((F^(g*(f*x+e)))^n)-ln(a+b*(F^(g*(f*x+e)))^n)
/a^3/f/g/n/ln(F)+1/a^2/f/(a+b*(F^(g*(f*x+e)))^n)/g/n/ln(F)+1/2/a/
f/(a+b*(F^(g*(f*x+e)))^n)^2/g/n/ln(F)
```

Maxima [A] time = 0.891325, size = 196, normalized size = 1.77

$$\frac{2\left(F^{fgx+eg}\right)^nb+3a}{2\left(2\left(F^{fgx+eg}\right)^na^3bn+\left(F^{fgx+eg}\right)^{2n}a^2b^2n+a^4n\right)fg\log(F)}+\frac{\log\left(F^{fgx+eg}\right)}{a^3fg\log(F)}-\frac{\log\left(\frac{\left(F^{fgx+eg}\right)^nb+a}{b}\right)}{a^3fgn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)^(-3),x, algorithm="maxima")
```

```
[Out] 1/2*(2*(F^(f*g*x + e*g))^n*b + 3*a)/((2*(F^(f*g*x + e*g))^n*a^3*b
*n + (F^(f*g*x + e*g))^(2*n)*a^2*b^2*n + a^4*n)*f*g*log(F)) + log
(F^(f*g*x + e*g))/(a^3*f*g*log(F)) - log(((F^(f*g*x + e*g))^n*b +
 a)/b)/(a^3*f*g*n*log(F))
```

Fricas [A] time = 0.280641, size = 257, normalized size = 2.32

$$\frac{2\,F^{2\,fgnx+2\,egn}b^{2}fgnx\log\left(F\right)+2\,a^{2}fgnx\log\left(F\right)+2\,\left(2\,abfgnx\log\left(F\right)+ab\right)F^{fgnx+egn}+3\,a^{2}-2\,\left(2\,F^{fgnx+egn}ab+F^{2\,fgnx+2\,egn}\cdots\right.}{2\,\left(2\,F^{fgnx+egn}a^{4}bfgn\log\left(F\right)+F^{2\,fgnx+2\,egn}a^{3}b^{2}fgn\log\left(F\right)+a^{5}fgn\log\left(F\right)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)^(-3),x, algorithm="fricas")
```

```
[Out] 1/2*(2*F^(2*f*g*n*x + 2*e*g*n)*b^2*f*g*n*x*log(F) + 2*a^2*f*g*n*x
*log(F) + 2*(2*a*b*f*g*n*x*log(F) + a*b)*F^(f*g*n*x + e*g*n) + 3*
a^2 - 2*(2*F^(f*g*n*x + e*g*n)*a*b + F^(2*f*g*n*x + 2*e*g*n)*b^2
+ a^2)*log(F^(f*g*n*x + e*g*n)*b + a))/(2*F^(f*g*n*x + e*g*n)*a^4
*b*f*g*n*log(F) + F^(2*f*g*n*x + 2*e*g*n)*a^3*b^2*f*g*n*log(F) +
a^5*f*g*n*log(F))
```

Sympy [A] time = 0.559611, size = 116, normalized size = 1.05

$$\frac{3a+2b\left(F^{g(e+fx)}\right)^{n}}{2a^{4}fgn\log\left(F\right)+4a^{3}bfgn\left(F^{g(e+fx)}\right)^{n}\log\left(F\right)+2a^{2}b^{2}fgn\left(F^{g(e+fx)}\right)^{2n}\log\left(F\right)}+\frac{x}{a^{3}}-\frac{\log\left(\frac{a}{b}+\left(F^{g(e+fx)}\right)^{n}\right)}{a^{3}fgn\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*(F**(g*(f*x+e)))**n)**3,x)
```

```
[Out] (3*a + 2*b*(F**(g*(e + f*x)))**n)/(2*a**4*f*g*n*log(F) + 4*a**3*b
*f*g*n*(F**(g*(e + f*x)))**n*log(F) + 2*a**2*b**2*f*g*n*(F**(g*(e
 + f*x)))**(2*n)*log(F)) + x/a**3 - log(a/b + (F**(g*(e + f*x)))*
*n)/(a**3*f*g*n*log(F))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(\left(F^{(fx+e)g}\right)^{n} b + a\right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)^(-3),x, algorithm="giac")

[Out] integrate(((F^((f*x + e)*g))^n*b + a)^(-3), x)
```

3.62 $\int \frac{1}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^3(c+dx)}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{1}{(c+dx)\left(a+b\left(F^{eg+fgx}\right)^n\right)^3},x\right)$$

```
[Out] Unintegrable[1/((a + b*(F^(e*g + f*g*x))^n)^3*(c + d*x)), x]
```

Rubi [A] time = 0.197856, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.

$$\text{Int}\left(\frac{1}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^3(c+dx)},x\right)$$

Verification is Not applicable to the result.

```
[In]  Int[1/((a + b*(F^(g*(e + f*x)))^n)^3*(c + d*x)),x]
```

```
[Out] Defer[Int][1/((a + b*(F^(e*g + f*g*x))^n)^3*(c + d*x)), x]
```

Rubi in Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\left(F^{eg+fgx}\right)^n\right)^3(c+dx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*(F**(g*(f*x+e)))**n)**3/(d*x+c),x)
```

```
[Out] Integral(1/((a + b*(F**(e*g + f*g*x))**n)**3*(c + d*x)), x)
```

Mathematica [A] time = 2.74281, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^3(c+dx)}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[1/((a + b*(F^(g*(e + f*x)))^n)^3*(c + d*x)),x]
```

```
[Out] Integrate[1/((a + b*(F^(g*(e + f*x)))^n)^3*(c + d*x)), x]
```

Maple [A] time = 0.227, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a + b\left(F^{g(fx+e)}\right)^{n}\right)^{3}(dx + c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*(F^(g*(f*x+e)))^n)^3/(d*x+c),x)
```

```
[Out] int(1/(a+b*(F^(g*(f*x+e)))^n)^3/(d*x+c),x)
```

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((F^((f*x + e)*g))^n*b + a)^3*(d*x + c)),x, algorithm="maxima")
```

```
[Out] 1/2*(3*a*d*f*g*n*x*log(F) + 3*a*c*f*g*n*log(F) + (2*(F^(e*g))^n*b
*d*f*g*n*x*log(F) + 2*(F^(e*g))^n*b*c*f*g*n*log(F) + (F^(e*g))^n*
b*d)*(F^(f*g*x))^n + a*d)/(a^4*d^2*f^2*g^2*n^2*x^2*log(F)^2 + 2*a
^4*c*d*f^2*g^2*n^2*x*log(F)^2 + a^4*c^2*f^2*g^2*n^2*log(F)^2 + ((
F^(e*g))^(2*n)*a^2*b^2*d^2*f^2*g^2*n^2*x^2*log(F)^2 + 2*(F^(e*g))
^(2*n)*a^2*b^2*c*d*f^2*g^2*n^2*x*log(F)^2 + (F^(e*g))^(2*n)*a^2*b
^2*c^2*f^2*g^2*n^2*log(F)^2)*(F^(f*g*x))^(2*n) + 2*((F^(e*g))^n*a
^3*b*d^2*f^2*g^2*n^2*x^2*log(F)^2 + 2*(F^(e*g))^n*a^3*b*c*d*f^2*g
^2*n^2*x*log(F)^2 + (F^(e*g))^n*a^3*b*c^2*f^2*g^2*n^2*log(F)^2)*(
F^(f*g*x))^n) + integrate(1/2*(2*d^2*f^2*g^2*n^2*x^2*log(F)^2 + 2
*c^2*f^2*g^2*n^2*log(F)^2 + 3*c*d*f*g*n*log(F) + 2*d^2 + (4*c*d*f
^2*g^2*n^2*log(F)^2 + 3*d^2*f*g*n*log(F))*x)/(a^3*d^3*f^2*g^2*n^2
*x^3*log(F)^2 + 3*a^3*c*d^2*f^2*g^2*n^2*x^2*log(F)^2 + 3*a^3*c^2*
d*f^2*g^2*n^2*x*log(F)^2 + a^3*c^3*f^2*g^2*n^2*log(F)^2 + ((F^(e*
g))^n*a^2*b*d^3*f^2*g^2*n^2*x^3*log(F)^2 + 3*(F^(e*g))^n*a^2*b*c*
d^2*f^2*g^2*n^2*x^2*log(F)^2 + 3*(F^(e*g))^n*a^2*b*c^2*d*f^2*g^2*
n^2*x*log(F)^2 + (F^(e*g))^n*a^2*b*c^3*f^2*g^2*n^2*log(F)^2)*(F^(
f*g*x))^n), x)
```

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

$$\text{integral}\left(\frac{1}{a^3dx + a^3c + (b^3dx + b^3c)\left(F^{fgx+eg}\right)^{3n} + 3\,(ab^2dx + ab^2c)\left(F^{fgx+eg}\right)^{2n} + 3\,(a^2bdx + a^2bc)\left(F^{fgx+eg}\right)^{n}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((F^((f*x + e)*g))^n*b + a)^3*(d*x + c)),x, algorithm="fricas")
```

```
[Out] integral(1/(a^3*d*x + a^3*c + (b^3*d*x + b^3*c)*(F^(f*g*x + e*g))
^(3*n) + 3*(a*b^2*d*x + a*b^2*c)*(F^(f*g*x + e*g))^(2*n) + 3*(a^2
*b*d*x + a^2*b*c)*(F^(f*g*x + e*g))^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*(F**(g*(f*x+e)))**n)**3/(d*x+c),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(\left(F^{(fx+e)g}\right)^{n}b + a\right)^{3}(dx + c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((F^((f*x + e)*g))^n*b + a)^3*(d*x + c)),x, algorithm="giac")
```

```
[Out] integrate(1/(((F^((f*x + e)*g))^n*b + a)^3*(d*x + c)), x)
```

3.63 $\int \frac{1}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^3 (c+dx)^2} \, dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{1}{(c+dx)^2 \left(a+b\left(F^{eg+fgx}\right)^n\right)^3},x\right)$$

```
[Out] Unintegrable[1/((a + b*(F^(e*g + f*g*x))^n)^3*(c + d*x)^2), x]
```

Rubi [A] time = 0.182426, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$

$$\text{Int}\left(\frac{1}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^3 (c+dx)^2},x\right)$$

Verification is Not applicable to the result.

```
[In]  Int[1/((a + b*(F^(g*(e + f*x)))^n)^3*(c + d*x)^2),x]

[Out] Defer[Int][1/((a + b*(F^(e*g + f*g*x))^n)^3*(c + d*x)^2), x]
```

Rubi in Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\left(F^{eg+fgx}\right)^n\right)^3 (c+dx)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*(F**(g*(f*x+e)))**n)**3/(d*x+c)**2,x)

[Out] Integral(1/((a + b*(F**(e*g + f*g*x))**n)**3*(c + d*x)**2), x)
```

Mathematica [A] time = 2.18292, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^3 (c+dx)^2} \, dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[1/((a + b*(F^(g*(e + f*x)))^n)^3*(c + d*x)^2),x]

[Out] Integrate[1/((a + b*(F^(g*(e + f*x)))^n)^3*(c + d*x)^2), x]
```

Maple [A] time = 0.405, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a + b \left(F^{g(f x+e)}\right)^{n}\right)^{3} (dx + c)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*(F^(g*(f*x+e)))^n)^3/(d*x+c)^2,x)

[Out] int(1/(a+b*(F^(g*(f*x+e)))^n)^3/(d*x+c)^2,x)
```

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((F^((f*x + e)*g))^n*b + a)^3*(d*x + c)^2),x, algorithm="maxima")

[Out] 1/2*(3*a*d*f*g*n*x*log(F) + 3*a*c*f*g*n*log(F) + 2*((F^(e*g))^n*b
*d*f*g*n*x*log(F) + (F^(e*g))^n*b*c*f*g*n*log(F) + (F^(e*g))^n*b*
d)*(F^(f*g*x))^n + 2*a*d)/(a^4*d^3*f^2*g^2*n^2*x^3*log(F)^2 + 3*a
^4*c*d^2*f^2*g^2*n^2*x^2*log(F)^2 + 3*a^4*c^2*d*f^2*g^2*n^2*x*log
(F)^2 + a^4*c^3*f^2*g^2*n^2*log(F)^2 + ((F^(e*g))^(2*n)*a^2*b^2*d
^3*f^2*g^2*n^2*x^3*log(F)^2 + 3*(F^(e*g))^(2*n)*a^2*b^2*c*d^2*f^2
*g^2*n^2*x^2*log(F)^2 + 3*(F^(e*g))^(2*n)*a^2*b^2*c^2*d*f^2*g^2*n
^2*x*log(F)^2 + (F^(e*g))^(2*n)*a^2*b^2*c^3*f^2*g^2*n^2*log(F)^2)
*(F^(f*g*x))^(2*n) + 2*((F^(e*g))^n*a^3*b*d^3*f^2*g^2*n^2*x^3*log
(F)^2 + 3*(F^(e*g))^n*a^3*b*c*d^2*f^2*g^2*n^2*x^2*log(F)^2 + 3*(F
^(e*g))^n*a^3*b*c^2*d*f^2*g^2*n^2*x*log(F)^2 + (F^(e*g))^n*a^3*b*
c^3*f^2*g^2*n^2*log(F)^2)*(F^(f*g*x))^n) + integrate((d^2*f^2*g^2
*n^2*x^2*log(F)^2 + c^2*f^2*g^2*n^2*log(F)^2 + 3*c*d*f*g*n*log(F)
 + 3*d^2 + (2*c*d*f^2*g^2*n^2*log(F)^2 + 3*d^2*f*g*n*log(F))*x)/(
a^3*d^4*f^2*g^2*n^2*x^4*log(F)^2 + 4*a^3*c*d^3*f^2*g^2*n^2*x^3*lo
g(F)^2 + 6*a^3*c^2*d^2*f^2*g^2*n^2*x^2*log(F)^2 + 4*a^3*c^3*d*f^2
*g^2*n^2*x*log(F)^2 + a^3*c^4*f^2*g^2*n^2*log(F)^2 + ((F^(e*g))^n
*a^2*b*d^4*f^2*g^2*n^2*x^4*log(F)^2 + 4*(F^(e*g))^n*a^2*b*c*d^3*f
^2*g^2*n^2*x^3*log(F)^2 + 6*(F^(e*g))^n*a^2*b*c^2*d^2*f^2*g^2*n^2
*x^2*log(F)^2 + 4*(F^(e*g))^n*a^2*b*c^3*d*f^2*g^2*n^2*x*log(F)^2
```

```
+ (F^(e*g))^n*a^2*b*c^4*f^2*g^2*n^2*log(F)^2)*(F^(f*g*x))^n), x)
```

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

$$\text{integral}\left(\frac{1}{a^3d^2x^2 + 2\,a^3cdx + a^3c^2 + (b^3d^2x^2 + 2\,b^3cdx + b^3c^2)\left(F^{fgx+eg}\right)^{3\,n} + 3\,(ab^2d^2x^2 + 2\,ab^2cdx + ab^2c^2)\left(F^{fgx+eg}\right)^{2\,n} + \cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((F^((f*x + e)*g))^n*b + a)^3*(d*x + c)^2),x, algorithm="fricas")
```

```
[Out] integral(1/(a^3*d^2*x^2 + 2*a^3*c*d*x + a^3*c^2 + (b^3*d^2*x^2 +
2*b^3*c*d*x + b^3*c^2)*(F^(f*g*x + e*g))^(3*n) + 3*(a*b^2*d^2*x^2
 + 2*a*b^2*c*d*x + a*b^2*c^2)*(F^(f*g*x + e*g))^(2*n) + 3*(a^2*b*
d^2*x^2 + 2*a^2*b*c*d*x + a^2*b*c^2)*(F^(f*g*x + e*g))^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*(F**(g*(f*x+e)))**n)**3/(d*x+c)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(\left(F^{(fx+e)g}\right)^{n}b + a\right)^{3}(dx + c)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((F^((f*x + e)*g))^n*b + a)^3*(d*x + c)^2),x, algorithm="giac")
```

```
[Out] integrate(1/(((F^((f*x + e)*g))^n*b + a)^3*(d*x + c)^2), x)
```

3.64 $\int (a+be^x)\sqrt{c+dx}\,dx$

Optimal. Leaf size=71

$$\frac{2a(c+dx)^{3/2}}{3d}-\frac{1}{2}\sqrt{\pi}b\sqrt{d}e^{-\frac{c}{d}}\operatorname{Erfi}\left(\frac{\sqrt{c+dx}}{\sqrt{d}}\right)+be^x\sqrt{c+dx}$$

```
[Out] b*E^x*Sqrt[c + d*x] + (2*a*(c + d*x)^(3/2))/(3*d) - (b*Sqrt[d]*Sq
rt[Pi]*Erfi[Sqrt[c + d*x]/Sqrt[d]])/(2*E^(c/d))
```

Rubi [A] time = 0.151445, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.235

$$\frac{2a(c+dx)^{3/2}}{3d}-\frac{1}{2}\sqrt{\pi}b\sqrt{d}e^{-\frac{c}{d}}\operatorname{Erfi}\left(\frac{\sqrt{c+dx}}{\sqrt{d}}\right)+be^x\sqrt{c+dx}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*E^x)*Sqrt[c + d*x],x]
```

```
[Out] b*E^x*Sqrt[c + d*x] + (2*a*(c + d*x)^(3/2))/(3*d) - (b*Sqrt[d]*Sq
rt[Pi]*Erfi[Sqrt[c + d*x]/Sqrt[d]])/(2*E^(c/d))
```

Rubi in Sympy [A] time = 12.4498, size = 61, normalized size = 0.86

$$\frac{2a\left(c+dx\right)^{\frac{3}{2}}}{3d}-\frac{\sqrt{\pi}b\sqrt{d}e^{-\frac{c}{d}}\operatorname{erfi}\left(\frac{\sqrt{c+dx}}{\sqrt{d}}\right)}{2}+b\sqrt{c+dx}e^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*exp(x))*(d*x+c)**(1/2),x)
```

```
[Out] 2*a*(c + d*x)**(3/2)/(3*d) - sqrt(pi)*b*sqrt(d)*exp(-c/d)*erfi(sq
rt(c + d*x)/sqrt(d))/2 + b*sqrt(c + d*x)*exp(x)
```

Mathematica [A] time = 0.593539, size = 106, normalized size = 1.49

$$\sqrt{c+dx}\left(\frac{2ac}{3d}+\frac{2ax}{3}+\frac{be^{-\frac{c}{d}}\left(-\sqrt{\pi}\text{Erf}\left(\sqrt{-\frac{c+dx}{d}}\right)+2e^{\frac{c}{d}+x}\sqrt{-\frac{c+dx}{d}}+\sqrt{\pi}\right)}{2\sqrt{-\frac{c+dx}{d}}}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*E^x)*Sqrt[c + d*x],x]
```

```
[Out] Sqrt[c + d*x]*((2*a*c)/(3*d) + (2*a*x)/3 + (b*(Sqrt[Pi] + 2*E^(c/
d + x)*Sqrt[-((c + d*x)/d)] - Sqrt[Pi]*Erf[Sqrt[-((c + d*x)/d)]])
)/(2*E^(c/d)*Sqrt[-((c + d*x)/d)]))
```

Maple [A] time = 0.008, size = 77, normalized size = 1.1

$$2\,{\frac {1}{d} \left(1/3\, \left(dx+c \right) ^{3/2}a+b \left(1/2\,\sqrt {dx+c}{{\rm e}^{{\frac {dx+c}{d}}}}d-1/4\,d\sqrt {\pi }{\it Erf} \left(\sqrt {-{d}^{-1}}\sqrt {dx+c} \right) {\frac {1}{\sqrt {-{d}^{-1}}}} \right) \left({{\rm e}^{{\frac {c}{d}}}} \right) ^{-1} \right) }$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/d*(1/3*(d*x+c)^(3/2)*a+b/exp(c/d)*(1/2*(d*x+c)^(1/2)*exp(1/d*(d
*x+c))*d-1/4*d*Pi^(1/2)/(-1/d)^(1/2)*erf((-1/d)^(1/2)*(d*x+c)^(1/
2))))
```

Maxima [A] time = 0.807371, size = 111, normalized size = 1.56

$$\frac{4\,(dx+c)^{\frac{3}{2}}a-3\left(\frac{\sqrt{\pi}\,d\,\mathrm{erf}\left(\sqrt{dx+c}\sqrt{-\frac{1}{d}}\right)e^{\left(-\frac{c}{d}\right)}}{\sqrt{-\frac{1}{d}}}-2\,\sqrt{dx+c}\,de^{\left(\frac{dx+c}{d}-\frac{c}{d}\right)}\right)b}{6\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(d*x + c)*(b*e^x + a),x, algorithm="maxima")
```

```
[Out] 1/6*(4*(d*x + c)^(3/2)*a - 3*(sqrt(pi)*d*erf(sqrt(d*x + c)*sqrt(-
1/d))*e^(-c/d)/sqrt(-1/d) - 2*sqrt(d*x + c)*d*e^((d*x + c)/d - c/
```

```
d))*b)/d
```

Fricas [A] time = 0.294201, size = 101, normalized size = 1.42

$$-\frac{3\sqrt{\pi}bd\operatorname{erf}\left(\sqrt{dx+c}\sqrt{-\frac{1}{d}}\right)e^{\left(-\frac{c}{d}\right)}-2\left(2\,adx+3\,bde^{x}+2\,ac\right)\sqrt{dx+c}\sqrt{-\frac{1}{d}}}{6\,d\sqrt{-\frac{1}{d}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(d*x + c)*(b*e^x + a),x, algorithm="fricas")
```

```
[Out] -1/6*(3*sqrt(pi)*b*d*erf(sqrt(d*x + c)*sqrt(-1/d))*e^(-c/d) - 2*(
2*a*d*x + 3*b*d*e^x + 2*a*c)*sqrt(d*x + c)*sqrt(-1/d))/(d*sqrt(-1
/d))
```

Sympy [A] time = 4.42522, size = 76, normalized size = 1.07

$$\frac{2a\left(c+dx\right)^{\frac{3}{2}}}{3d}+b\sqrt{c+dx}e^{-\frac{c}{d}}e^{\frac{c}{d}+x}+\frac{i\sqrt{\pi}be^{-\frac{c}{d}}\operatorname{erf}\left(i\sqrt{c+dx}\sqrt{\frac{1}{d}}\right)}{2\sqrt{\frac{1}{d}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2*a*(c + d*x)**(3/2)/(3*d) + b*sqrt(c + d*x)*exp(-c/d)*exp(c/d +
x) + I*sqrt(pi)*b*exp(-c/d)*erf(I*sqrt(c + d*x)*sqrt(1/d))/(2*sqr
t(1/d))
```

GIAC/XCAS [A] time = 0.321412, size = 93, normalized size = 1.31

$$\frac{4\left(dx+c\right)^{\frac{3}{2}}a+3\left(\frac{\sqrt{\pi}d^{2}\operatorname{erf}\left(-\frac{\sqrt{dx+c}\sqrt{-d}}{d}\right)e^{\left(-\frac{c}{d}\right)}}{\sqrt{-d}}+2\sqrt{dx+c}de^{x}\right)b}{6\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(d*x + c)*(b*e^x + a),x, algorithm="giac")
```

```
[Out] 1/6*(4*(d*x + c)^(3/2)*a + 3*(sqrt(pi)*d^2*erf(-sqrt(d*x + c)*sqr
t(-d)/d)*e^(-c/d)/sqrt(-d) + 2*sqrt(d*x + c)*d*e^x)*b)/d
```

3.65 $\int (a+be^x)^2 \sqrt{c+dx}\,dx$

Optimal. Leaf size=145

$$\frac{2a^2(c+dx)^{3/2}}{3d} - \sqrt{\pi}ab\sqrt{d}e^{-\frac{c}{d}}\text{Erfi}\left(\frac{\sqrt{c+dx}}{\sqrt{d}}\right) + 2abe^x\sqrt{c+dx} - \frac{1}{4}\sqrt{\frac{\pi}{2}}b^2\sqrt{d}e^{-\frac{2c}{d}}\text{Erfi}\left(\frac{\sqrt{2}\sqrt{c+dx}}{\sqrt{d}}\right) + \frac{1}{2}b^2e^{2x}\sqrt{c+dx}$$

```
[Out] 2*a*b*E^x*Sqrt[c + d*x] + (b^2*E^(2*x)*Sqrt[c + d*x])/2 + (2*a^2*
(c + d*x)^(3/2))/(3*d) - (a*b*Sqrt[d]*Sqrt[Pi]*Erfi[Sqrt[c + d*x]
/Sqrt[d]])/E^(c/d) - (b^2*Sqrt[d]*Sqrt[Pi/2]*Erfi[(Sqrt[2]*Sqrt[c
 + d*x])/Sqrt[d]])/(4*E^((2*c)/d))
```

Rubi [A] time = 0.332069, antiderivative size = 145, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.21$

$$\frac{2a^2(c+dx)^{3/2}}{3d} - \sqrt{\pi}ab\sqrt{d}e^{-\frac{c}{d}}\text{Erfi}\left(\frac{\sqrt{c+dx}}{\sqrt{d}}\right) + 2abe^x\sqrt{c+dx} - \frac{1}{4}\sqrt{\frac{\pi}{2}}b^2\sqrt{d}e^{-\frac{2c}{d}}\text{Erfi}\left(\frac{\sqrt{2}\sqrt{c+dx}}{\sqrt{d}}\right) + \frac{1}{2}b^2e^{2x}\sqrt{c+dx}$$

Antiderivative was successfully verified.

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

```
[Out] 2*a*b*E^x*Sqrt[c + d*x] + (b^2*E^(2*x)*Sqrt[c + d*x])/2 + (2*a^2*
(c + d*x)^(3/2))/(3*d) - (a*b*Sqrt[d]*Sqrt[Pi]*Erfi[Sqrt[c + d*x]
/Sqrt[d]])/E^(c/d) - (b^2*Sqrt[d]*Sqrt[Pi/2]*Erfi[(Sqrt[2]*Sqrt[c
 + d*x])/Sqrt[d]])/(4*E^((2*c)/d))
```

Rubi in Sympy [A] time = 25.8784, size = 133, normalized size = 0.92

$$\frac{2a^2(c+dx)^{\frac{3}{2}}}{3d} - \sqrt{\pi}ab\sqrt{d}e^{-\frac{c}{d}}\operatorname{erfi}\left(\frac{\sqrt{c+dx}}{\sqrt{d}}\right) + 2ab\sqrt{c+dx}e^x - \frac{\sqrt{2}\sqrt{\pi}b^2\sqrt{d}e^{-\frac{2c}{d}}\operatorname{erfi}\left(\frac{\sqrt{2}\sqrt{c+dx}}{\sqrt{d}}\right)}{8} + \frac{b^2\sqrt{c+dx}e^{2x}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*exp(x))**2*(d*x+c)**(1/2),x)
```

```
[Out] 2*a**2*(c + d*x)**(3/2)/(3*d) - sqrt(pi)*a*b*sqrt(d)*exp(-c/d)*er
fi(sqrt(c + d*x)/sqrt(d)) + 2*a*b*sqrt(c + d*x)*exp(x) - sqrt(2)*
sqrt(pi)*b**2*sqrt(d)*exp(-2*c/d)*erfi(sqrt(2)*sqrt(c + d*x)/sqrt
(d))/8 + b**2*sqrt(c + d*x)*exp(2*x)/2
```

Mathematica [A] time = 0.766045, size = 197, normalized size = 1.36

$$-\frac{\sqrt{-\frac{c+dx}{d}}\left(-8a^2d\left(-\frac{c+dx}{d}\right)^{3/2}+12abde^{-\frac{c}{d}}\left(-\sqrt{\pi}\text{Erf}\left(\sqrt{-\frac{c+dx}{d}}\right)+2e^{\frac{c}{d}+x}\sqrt{-\frac{c+dx}{d}}+\sqrt{\pi}\right)+3\sqrt{2}b^2de^{-\frac{2c}{d}}\left(\sqrt{2}e^{2\left(\frac{c}{d}+x\right)}\sqrt{-\frac{c+}{a}}\right.\right.}{12\sqrt{c+dx}}$$

Antiderivative was successfully verified.

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

```
[Out] -(Sqrt[-((c + d*x)/d)]*(-8*a^2*d*(-((c + d*x)/d))^(3/2) + (12*a*b
*d*(Sqrt[Pi] + 2*E^(c/d + x)*Sqrt[-((c + d*x)/d)] - Sqrt[Pi]*Erf[
Sqrt[-((c + d*x)/d)]]))/E^(c/d) + (3*Sqrt[2]*b^2*d*(Sqrt[2]*E^(2*
(c/d + x))*Sqrt[-((c + d*x)/d)] - (Sqrt[Pi]*(-1 + Erf[Sqrt[2]*Sqr
t[-((c + d*x)/d)]]))/2))/E^((2*c)/d)))/(12*Sqrt[c + d*x])
```

Maple [A] time = 0.006, size = 144, normalized size = 1.

$$2\,\frac{1}{d}\left(1/3\,\left(dx+c\right)^{3/2}a^2+b^2\left(1/4\,d\sqrt{dx+c}e^{2\,\frac{dx+c}{d}}-1/8\,d\sqrt{\pi}Erf\left(\sqrt{-2\,d^{-1}}\sqrt{dx+c}\right)\frac{1}{\sqrt{-2\,d^{-1}}}\right)\left(e^{\frac{c}{d}}\right)^{-2}+2\,ab\left(1/2\,\sqrt{dx+c}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/d*(1/3*(d*x+c)^(3/2)*a^2+b^2/exp(c/d)^2*(1/4*d*(d*x+c)^(1/2)*ex
p(2/d*(d*x+c))-1/8*d*Pi^(1/2)/(-2/d)^(1/2)*erf((-2/d)^(1/2)*(d*x+
c)^(1/2)))+2*a*b/exp(c/d)*(1/2*(d*x+c)^(1/2)*exp(1/d*(d*x+c))*d-1
/4*d*Pi^(1/2)/(-1/d)^(1/2)*erf((-1/d)^(1/2)*(d*x+c)^(1/2))))
```

Maxima [A] time = 0.853262, size = 216, normalized size = 1.49

$$\frac{16\,(dx+c)^{\frac{3}{2}}a^2 - 24\left(\frac{\sqrt{\pi}d\,\mathrm{erf}\left(\sqrt{dx+c}\sqrt{-\frac{1}{d}}\right)e^{\left(-\frac{c}{d}\right)}}{\sqrt{-\frac{1}{d}}} - 2\sqrt{dx+c}de^{\left(\frac{dx+c}{d}-\frac{c}{d}\right)}\right)ab - 3\left(\frac{\sqrt{2}\sqrt{\pi}d\,\mathrm{erf}\left(\sqrt{2}\sqrt{dx+c}\sqrt{-\frac{1}{d}}\right)e^{\left(-\frac{2c}{d}\right)}}{\sqrt{-\frac{1}{d}}} - 4\sqrt{dx+c}de^{\left(\cdots\right.}\right.}{24\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/24*(16*(d*x + c)^(3/2)*a^2 - 24*(sqrt(pi)*d*erf(sqrt(d*x + c)*s
qrt(-1/d))*e^(-c/d)/sqrt(-1/d) - 2*sqrt(d*x + c)*d*e^((d*x + c)/d
 - c/d))*a*b - 3*(sqrt(2)*sqrt(pi)*d*erf(sqrt(2)*sqrt(d*x + c)*sq
rt(-1/d))*e^(-2*c/d)/sqrt(-1/d) - 4*sqrt(d*x + c)*d*e^(2*(d*x + c
)/d - 2*c/d))*b^2)/d
```

Fricas [A] time = 0.255003, size = 182, normalized size = 1.26

$$\frac{1}{24}\sqrt{2}\left(12\sqrt{2}\sqrt{\pi}abd\sqrt{-\frac{1}{d}}\,\mathrm{erf}\left(\sqrt{dx+c}\sqrt{-\frac{1}{d}}\right)e^{\left(-\frac{c}{d}\right)} + 3\sqrt{\pi}b^2d\sqrt{-\frac{1}{d}}\,\mathrm{erf}\left(\sqrt{2}\sqrt{dx+c}\sqrt{-\frac{1}{d}}\right)e^{\left(-\frac{2c}{d}\right)} + \frac{2\sqrt{2}\left(4a^2dx + 3b^2\cdots\right.}{\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/24*sqrt(2)*(12*sqrt(2)*sqrt(pi)*a*b*d*sqrt(-1/d)*erf(sqrt(d*x +
 c)*sqrt(-1/d))*e^(-c/d) + 3*sqrt(pi)*b^2*d*sqrt(-1/d)*erf(sqrt(2
)*sqrt(d*x + c)*sqrt(-1/d))*e^(-2*c/d) + 2*sqrt(2)*(4*a^2*d*x + 3
*b^2*d*e^(2*x) + 12*a*b*d*e^x + 4*a^2*c)*sqrt(d*x + c)/d
```

Sympy [A] time = 6.62214, size = 167, normalized size = 1.15

$$\frac{2a^2\,(c+dx)^{\frac{3}{2}}}{3d} + 2ab\sqrt{c+dx}e^{-\frac{c}{d}}e^{\frac{c}{d}+x} + \frac{i\sqrt{\pi}abe^{-\frac{c}{d}}\,\mathrm{erf}\left(i\sqrt{c+dx}\sqrt{\frac{1}{d}}\right)}{\sqrt{\frac{1}{d}}}$$
$$+\frac{b^2\sqrt{c+dx}e^{-\frac{2c}{d}}e^{\frac{2c}{d}+2x}}{2} + \frac{\sqrt{2}i\sqrt{\pi}b^2e^{-\frac{2c}{d}}\,\mathrm{erf}\left(\sqrt{2}i\sqrt{c+dx}\sqrt{\frac{1}{d}}\right)}{8\sqrt{\frac{1}{d}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2*a**2*(c + d*x)**(3/2)/(3*d) + 2*a*b*sqrt(c + d*x)*exp(-c/d)*exp
(c/d + x) + I*sqrt(pi)*a*b*exp(-c/d)*erf(I*sqrt(c + d*x)*sqrt(1/d
))/sqrt(1/d) + b**2*sqrt(c + d*x)*exp(-2*c/d)*exp(2*c/d + 2*x)/2
+ sqrt(2)*I*sqrt(pi)*b**2*exp(-2*c/d)*erf(sqrt(2)*I*sqrt(c + d*x)
*sqrt(1/d))/(8*sqrt(1/d))
```

GIAC/XCAS [A] time = 0.264448, size = 182, normalized size = 1.26

$$\frac{16\,(dx+c)^{\frac{3}{2}}a^2 + 24\left(\frac{\sqrt{\pi}d^2\operatorname{erf}\left(-\frac{\sqrt{dx+c}\sqrt{-d}}{d}\right)e^{\left(-\frac{c}{d}\right)}}{\sqrt{-d}} + 2\sqrt{dx+c}\,de^x\right)ab + 3\left(\frac{\sqrt{2}\sqrt{\pi}d^2\operatorname{erf}\left(-\frac{\sqrt{2}\sqrt{dx+c}\sqrt{-d}}{d}\right)e^{\left(-\frac{2c}{d}\right)}}{\sqrt{-d}} + 4\sqrt{dx+c}\,de^{(2x)}\right)b^2}{24\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/24*(16*(d*x + c)^(3/2)*a^2 + 24*(sqrt(pi)*d^2*erf(-sqrt(d*x + c
)*sqrt(-d)/d)*e^(-c/d)/sqrt(-d) + 2*sqrt(d*x + c)*d*e^x)*a*b + 3*
(sqrt(2)*sqrt(pi)*d^2*erf(-sqrt(2)*sqrt(d*x + c)*sqrt(-d)/d)*e^(-
2*c/d)/sqrt(-d) + 4*sqrt(d*x + c)*d*e^(2*x))*b^2)/d
```

3.66 $\int (a+be^x)^3 \sqrt{c+dx}\,dx$

Optimal. Leaf size=224

$$\frac{2a^3(c+dx)^{3/2}}{3d} - \frac{3}{2}\sqrt{\pi}a^2b\sqrt{d}e^{-\frac{c}{d}}\text{Erfi}\left(\frac{\sqrt{c+dx}}{\sqrt{d}}\right) + 3a^2be^x\sqrt{c+dx} - \frac{3}{4}\sqrt{\frac{\pi}{2}}ab^2\sqrt{d}e^{-\frac{2c}{d}}\text{Erfi}\left(\frac{\sqrt{2}\sqrt{c+dx}}{\sqrt{d}}\right) + \frac{3}{2}ab^2e^{2x}\sqrt{c+dx} - \frac{1}{6}\sqrt{\frac{\pi}{3}}b^3\sqrt{d}e^{-\frac{3c}{d}}\text{Erfi}\left(\frac{\sqrt{3}\sqrt{c+dx}}{\sqrt{d}}\right) + \frac{1}{3}b^3e^{3x}\sqrt{c+dx}$$

```
[Out] 3*a^2*b*E^x*Sqrt[c + d*x] + (3*a*b^2*E^(2*x)*Sqrt[c + d*x])/2 + (
b^3*E^(3*x)*Sqrt[c + d*x])/3 + (2*a^3*(c + d*x)^(3/2))/(3*d) - (3
*a^2*b*Sqrt[d]*Sqrt[Pi]*Erfi[Sqrt[c + d*x]/Sqrt[d]])/(2*E^(c/d))
- (3*a*b^2*Sqrt[d]*Sqrt[Pi/2]*Erfi[(Sqrt[2]*Sqrt[c + d*x])/Sqrt[d
]])/(4*E^((2*c)/d)) - (b^3*Sqrt[d]*Sqrt[Pi/3]*Erfi[(Sqrt[3]*Sqrt[
c + d*x])/Sqrt[d]])/(6*E^((3*c)/d))
```

Rubi [A] time = 0.449331, antiderivative size = 224, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.21$

$$\frac{2a^3(c+dx)^{3/2}}{3d} - \frac{3}{2}\sqrt{\pi}a^2b\sqrt{d}e^{-\frac{c}{d}}\text{Erfi}\left(\frac{\sqrt{c+dx}}{\sqrt{d}}\right) + 3a^2be^x\sqrt{c+dx} - \frac{3}{4}\sqrt{\frac{\pi}{2}}ab^2\sqrt{d}e^{-\frac{2c}{d}}\text{Erfi}\left(\frac{\sqrt{2}\sqrt{c+dx}}{\sqrt{d}}\right) + \frac{3}{2}ab^2e^{2x}\sqrt{c+dx} - \frac{1}{6}\sqrt{\frac{\pi}{3}}b^3\sqrt{d}e^{-\frac{3c}{d}}\text{Erfi}\left(\frac{\sqrt{3}\sqrt{c+dx}}{\sqrt{d}}\right) + \frac{1}{3}b^3e^{3x}\sqrt{c+dx}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*E^x)^3*Sqrt[c + d*x],x]
```

```
[Out] 3*a^2*b*E^x*Sqrt[c + d*x] + (3*a*b^2*E^(2*x)*Sqrt[c + d*x])/2 + (
b^3*E^(3*x)*Sqrt[c + d*x])/3 + (2*a^3*(c + d*x)^(3/2))/(3*d) - (3
*a^2*b*Sqrt[d]*Sqrt[Pi]*Erfi[Sqrt[c + d*x]/Sqrt[d]])/(2*E^(c/d))
- (3*a*b^2*Sqrt[d]*Sqrt[Pi/2]*Erfi[(Sqrt[2]*Sqrt[c + d*x])/Sqrt[d
]])/(4*E^((2*c)/d)) - (b^3*Sqrt[d]*Sqrt[Pi/3]*Erfi[(Sqrt[3]*Sqrt[
c + d*x])/Sqrt[d]])/(6*E^((3*c)/d))
```

Rubi in Sympy [A] time = 37.1849, size = 212, normalized size = 0.95

$$\frac{2a^3(c+dx)^{\frac{3}{2}}}{3d} - \frac{3\sqrt{\pi}a^2b\sqrt{d}e^{-\frac{c}{d}}\operatorname{erfi}\left(\frac{\sqrt{c+dx}}{\sqrt{d}}\right)}{2} + 3a^2b\sqrt{c+dx}e^x - \frac{3\sqrt{2}\sqrt{\pi}ab^2\sqrt{d}e^{-\frac{2c}{d}}\operatorname{erfi}\left(\frac{\sqrt{2}\sqrt{c+dx}}{\sqrt{d}}\right)}{8} + \frac{3ab^2\sqrt{c+dx}e^{2x}}{2} - \frac{\sqrt{3}\sqrt{\pi}b^3\sqrt{d}e^{-\frac{3c}{d}}\operatorname{erfi}\left(\frac{\sqrt{3}\sqrt{c+dx}}{\sqrt{d}}\right)}{18} + \frac{b^3\sqrt{c+dx}e^{3x}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*exp(x))**3*(d*x+c)**(1/2),x)
```

```
[Out] 2*a**3*(c + d*x)**(3/2)/(3*d) - 3*sqrt(pi)*a**2*b*sqrt(d)*exp(-c/
d)*erfi(sqrt(c + d*x)/sqrt(d))/2 + 3*a**2*b*sqrt(c + d*x)*exp(x)
- 3*sqrt(2)*sqrt(pi)*a*b**2*sqrt(d)*exp(-2*c/d)*erfi(sqrt(2)*sqrt
(c + d*x)/sqrt(d))/8 + 3*a*b**2*sqrt(c + d*x)*exp(2*x)/2 - sqrt(3
)*sqrt(pi)*b**3*sqrt(d)*exp(-3*c/d)*erfi(sqrt(3)*sqrt(c + d*x)/sq
rt(d))/18 + b**3*sqrt(c + d*x)*exp(3*x)/3
```

Mathematica [A] time = 1.08626, size = 285, normalized size = 1.27

$$-\frac{\sqrt{-\frac{c+dx}{d}}\left(-24a^3d\left(-\frac{c+dx}{d}\right)^{3/2} + 54a^2bde^{-\frac{c}{d}}\left(-\sqrt{\pi}\operatorname{Erf}\left(\sqrt{-\frac{c+dx}{d}}\right) + 2e^{\frac{c}{d}+x}\sqrt{-\frac{c+dx}{d}} + \sqrt{\pi}\right) + 27\sqrt{2}ab^2de^{-\frac{2c}{d}}\left(\sqrt{2}e^{2\left(\frac{c}{d}+x\right)}\sqrt{\right.\right.}{36\sqrt{c+dx}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*E^x)^3*Sqrt[c + d*x],x]
```

```
[Out] -(Sqrt[-((c + d*x)/d)]*(-24*a^3*d*(-((c + d*x)/d))^(3/2) + (54*a^
2*b*d*(Sqrt[Pi] + 2*E^(c/d + x)*Sqrt[-((c + d*x)/d)] - Sqrt[Pi]*E
rf[Sqrt[-((c + d*x)/d)]]))/E^(c/d) + (27*Sqrt[2]*a*b^2*d*(Sqrt[2]
*E^(2*(c/d + x))*Sqrt[-((c + d*x)/d)] - (Sqrt[Pi]*(-1 + Erf[Sqrt[
2]*Sqrt[-((c + d*x)/d)]]))/2))/E^((2*c)/d) + (2*Sqrt[3]*b^3*d*(Sq
rt[Pi] + 2*Sqrt[3]*E^(3*(c/d + x))*Sqrt[-((c + d*x)/d)] - Sqrt[Pi
]*Erf[Sqrt[3]*Sqrt[-((c + d*x)/d)]]))/E^((3*c)/d)))/(36*Sqrt[c +
d*x])
```

Maple [A] time = 0.007, size = 211, normalized size = 0.9

$$2\frac{1}{d}\left(1/3\,(dx+c)^{3/2}a^3 + b^3\left(1/6\,d\sqrt{dx+c}e^{3\,\frac{dx+c}{d}} - 1/12\,d\sqrt{\pi}Erf\left(\sqrt{-3\,d^{-1}}\sqrt{dx+c}\right)\frac{1}{\sqrt{-3\,d^{-1}}}\right)\left(e^{\frac{c}{d}}\right)^{-3} + 3\,ab^2\left(1/4\,d\sqrt{dx\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*exp(x))^3*(d*x+c)^(1/2),x)
```

```
[Out] 2/d*(1/3*(d*x+c)^(3/2)*a^3+b^3/exp(c/d)^3*(1/6*d*(d*x+c)^(1/2)*ex
p(3/d*(d*x+c))-1/12*d*Pi^(1/2)/(-3/d)^(1/2)*erf((-3/d)^(1/2)*(d*x
+c)^(1/2)))+3*a*b^2/exp(c/d)^2*(1/4*d*(d*x+c)^(1/2)*exp(2/d*(d*x+
c))-1/8*d*Pi^(1/2)/(-2/d)^(1/2)*erf((-2/d)^(1/2)*(d*x+c)^(1/2)))+
3*a^2*b/exp(c/d)*(1/2*(d*x+c)^(1/2)*exp(1/d*(d*x+c))*d-1/4*d*Pi^(
1/2)/(-1/d)^(1/2)*erf((-1/d)^(1/2)*(d*x+c)^(1/2))))
```

Maxima [A] time = 0.878151, size = 321, normalized size = 1.43

$$\frac{48\,(dx+c)^{\frac{3}{2}}a^3 - 108\left(\frac{\sqrt{\pi}d\,\operatorname{erf}\left(\sqrt{dx+c}\sqrt{-\frac{1}{d}}\right)e^{\left(-\frac{c}{d}\right)}}{\sqrt{-\frac{1}{d}}} - 2\,\sqrt{dx+c}\,de^{\left(\frac{dx+c}{d}-\frac{c}{d}\right)}\right)a^2b - 27\left(\frac{\sqrt{2}\sqrt{\pi}d\,\operatorname{erf}\left(\sqrt{2}\sqrt{dx+c}\sqrt{-\frac{1}{d}}\right)e^{\left(-\frac{2c}{d}\right)}}{\sqrt{-\frac{1}{d}}} - 4\,\sqrt{dx+c}\cdots\right.}{72\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/72*(48*(d*x + c)^(3/2)*a^3 - 108*(sqrt(pi)*d*erf(sqrt(d*x + c)*
sqrt(-1/d))*e^(-c/d)/sqrt(-1/d) - 2*sqrt(d*x + c)*d*e^((d*x + c)/
d - c/d))*a^2*b - 27*(sqrt(2)*sqrt(pi)*d*erf(sqrt(2)*sqrt(d*x + c
)*sqrt(-1/d))*e^(-2*c/d)/sqrt(-1/d) - 4*sqrt(d*x + c)*d*e^(2*(d*x
 + c)/d - 2*c/d))*a*b^2 - 4*(sqrt(3)*sqrt(pi)*d*erf(sqrt(3)*sqrt(
d*x + c)*sqrt(-1/d))*e^(-3*c/d)/sqrt(-1/d) - 6*sqrt(d*x + c)*d*e^
(3*(d*x + c)/d - 3*c/d))*b^3)/d
```

Fricas [A] time = 0.257096, size = 267, normalized size = 1.19

$$-\frac{\sqrt{3}\sqrt{2}\left(18\,\sqrt{3}\sqrt{2}\sqrt{\pi}a^2b\,\operatorname{erf}\left(\sqrt{dx+c}\sqrt{-\frac{1}{d}}\right)e^{\left(-\frac{c}{d}\right)} + 9\,\sqrt{3}\sqrt{\pi}ab^2\,\operatorname{erf}\left(\sqrt{2}\sqrt{dx+c}\sqrt{-\frac{1}{d}}\right)e^{\left(-\frac{2c}{d}\right)} + 2\,\sqrt{2}\sqrt{\pi}b^3\,\operatorname{erf}\left(\sqrt{3}\sqrt{dx+\cdots}\right.\right.}{72\,\sqrt{-\frac{1}{d}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/72*sqrt(3)*sqrt(2)*(18*sqrt(3)*sqrt(2)*sqrt(pi)*a^2*b*erf(sqrt
(d*x + c)*sqrt(-1/d))*e^(-c/d) + 9*sqrt(3)*sqrt(pi)*a*b^2*erf(sqr
```

```
t(2)*sqrt(d*x + c)*sqrt(-1/d))*e^(-2*c/d) + 2*sqrt(2)*sqrt(pi)*b^
3*erf(sqrt(3)*sqrt(d*x + c)*sqrt(-1/d))*e^(-3*c/d) - 2*sqrt(3)*sq
rt(2)*(4*a^3*d*x + 2*b^3*d*e^(3*x) + 9*a*b^2*d*e^(2*x) + 18*a^2*b
*d*e^x + 4*a^3*c)*sqrt(d*x + c)*sqrt(-1/d)/d)/sqrt(-1/d)
```

Sympy [A] time = 9.35451, size = 265, normalized size = 1.18

$$\frac{2a^3(c+dx)^{\frac{3}{2}}}{3d} + 3a^2b\sqrt{c+dx}e^{-\frac{c}{d}}e^{\frac{c}{d}+x} + \frac{3i\sqrt{\pi}a^2be^{-\frac{c}{d}}\operatorname{erf}\left(i\sqrt{c+dx}\sqrt{\frac{1}{d}}\right)}{2\sqrt{\frac{1}{d}}} + \frac{3ab^2\sqrt{c+dx}e^{-\frac{2c}{d}}e^{\frac{2c}{d}+2x}}{2} + \frac{3\sqrt{2}i\sqrt{\pi}ab^2e^{-\frac{2c}{d}}\operatorname{erf}\left(\sqrt{2}i\sqrt{c+dx}\sqrt{\frac{1}{d}}\right)}{8\sqrt{\frac{1}{d}}} + \frac{b^3\sqrt{c+dx}e^{-\frac{3c}{d}}e^{\frac{3c}{d}+3x}}{3} + \frac{\sqrt{3}i\sqrt{\pi}b^3e^{-\frac{3c}{d}}\operatorname{erf}\left(\sqrt{3}i\sqrt{c+dx}\sqrt{\frac{1}{d}}\right)}{18\sqrt{\frac{1}{d}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*exp(x))**3*(d*x+c)**(1/2),x)
```

```
[Out] 2*a**3*(c + d*x)**(3/2)/(3*d) + 3*a**2*b*sqrt(c + d*x)*exp(-c/d)*
exp(c/d + x) + 3*I*sqrt(pi)*a**2*b*exp(-c/d)*erf(I*sqrt(c + d*x)*
sqrt(1/d))/(2*sqrt(1/d)) + 3*a*b**2*sqrt(c + d*x)*exp(-2*c/d)*exp
(2*c/d + 2*x)/2 + 3*sqrt(2)*I*sqrt(pi)*a*b**2*exp(-2*c/d)*erf(sqr
t(2)*I*sqrt(c + d*x)*sqrt(1/d))/(8*sqrt(1/d)) + b**3*sqrt(c + d*x
)*exp(-3*c/d)*exp(3*c/d + 3*x)/3 + sqrt(3)*I*sqrt(pi)*b**3*exp(-3
*c/d)*erf(sqrt(3)*I*sqrt(c + d*x)*sqrt(1/d))/(18*sqrt(1/d))
```

GIAC/XCAS [A] time = 0.239575, size = 271, normalized size = 1.21

$$\frac{48(dx+c)^{\frac{3}{2}}a^3 + 108\left(\frac{\sqrt{\pi}d^2\operatorname{erf}\left(-\frac{\sqrt{dx+c}\sqrt{-d}}{d}\right)e^{\left(-\frac{c}{d}\right)}}{\sqrt{-d}} + 2\sqrt{dx+c}de^x\right)a^2b + 27\left(\frac{\sqrt{2}\sqrt{\pi}d^2\operatorname{erf}\left(-\frac{\sqrt{2}\sqrt{dx+c}\sqrt{-d}}{d}\right)e^{\left(-\frac{2c}{d}\right)}}{\sqrt{-d}} + 4\sqrt{dx+c}de^{(2x)}\right)a}{72d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/72*(48*(d*x + c)^(3/2)*a^3 + 108*(sqrt(pi)*d^2*erf(-sqrt(d*x +
c)*sqrt(-d)/d)*e^(-c/d)/sqrt(-d) + 2*sqrt(d*x + c)*d*e^x)*a^2*b +
 27*(sqrt(2)*sqrt(pi)*d^2*erf(-sqrt(2)*sqrt(d*x + c)*sqrt(-d)/d)*
e^(-2*c/d)/sqrt(-d) + 4*sqrt(d*x + c)*d*e^(2*x))*a*b^2 + 4*(sqrt(
3)*sqrt(pi)*d^2*erf(-sqrt(3)*sqrt(d*x + c)*sqrt(-d)/d)*e^(-3*c/d)
/sqrt(-d) + 6*sqrt(d*x + c)*d*e^(3*x))*b^3)/d
```

3.67 $\int \frac{\sqrt{c+dx}}{a+be^x}\,dx$

Optimal. Leaf size=22

$$\text{Int}\left(\frac{\sqrt{c+dx}}{a+be^x},x\right)$$

```
[Out] Unintegrable[Sqrt[c + d*x]/(a + b*E^x), x]
```

Rubi [A] time = 0.0630843, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$

$$\text{Int}\left(\frac{\sqrt{c+dx}}{a+be^x},x\right)$$

Verification is Not applicable to the result.

```
[In]  Int[Sqrt[c + d*x]/(a + b*E^x),x]
```

```
[Out] Defer[Int][Sqrt[c + d*x]/(a + b*E^x), x]
```

Rubi in Sympy [A] time = 0., size = 0, normalized size = 0.

$$\frac{d\int \frac{\log\left(\frac{ae^{-x}}{b}+1\right)}{\sqrt{c+dx}}\,dx}{2a} - \frac{\sqrt{c+dx}\log\left(\frac{ae^{-x}}{b}+1\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**(1/2)/(a+b*exp(x)),x)
```

```
[Out] d*Integral(log(a*exp(-x)/b + 1)/sqrt(c + d*x), x)/(2*a) - sqrt(c
+ d*x)*log(a*exp(-x)/b + 1)/a
```

Mathematica [A] time = 0.351695, size = 0, normalized size = 0.

$$\int \frac{\sqrt{c+dx}}{a+be^x}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[c + d*x]/(a + b*E^x),x]
```

```
[Out] Integrate[Sqrt[c + d*x]/(a + b*E^x), x]
```

Maple [A] time = 0.038, size = 0, normalized size = 0.

$$\int \frac{1}{a+be^x}\sqrt{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((d*x+c)^(1/2)/(a+b*exp(x)),x)
```

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

$$\int \frac{\sqrt{dx+c}}{be^x+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{\sqrt{dx+c}}{be^x+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral(sqrt(d*x + c)/(b*e^x + a), x)
```

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

$$\int \frac{\sqrt{c+dx}}{a+be^x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Integral(sqrt(c + d*x)/(a + b*exp(x)), x)
```

GIAC/XCAS [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{dx+c}}{be^x+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.68 $\int \frac{\sqrt{c+dx}}{(a+be^x)^2}\,dx$

Optimal. Leaf size=22

$$\text{Int}\left(\frac{\sqrt{c+dx}}{(a+be^x)^2},x\right)$$

```
[Out] Unintegrable[Sqrt[c + d*x]/(a + b*E^x)^2, x]
```

Rubi [A] time = 0.0602979, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.

$$\text{Int}\left(\frac{\sqrt{c+dx}}{(a+be^x)^2},x\right)$$

Verification is Not applicable to the result.

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

[Out] Defer[Int][Sqrt[c + d*x]/(a + b*E^x)^2, x]
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**(1/2)/(a+b*exp(x))**2,x)

[Out] Timed out
```

Mathematica [A] time = 0.784623, size = 0, normalized size = 0.

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

Verification is Not applicable to the result.

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

```
[Out] Integrate[Sqrt[c + d*x]/(a + b*E^x)^2, x]
```

Maple [A] time = 0.062, size = 0, normalized size = 0.

$$\int \frac{1}{(a+b\mathrm{e}^{x})^{2}}\sqrt{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((d*x+c)^(1/2)/(a+b*exp(x))^2,x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{\sqrt{dx+c}}{b^{2}e^{(2\,x)}+2\,abe^{x}+a^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Integral(sqrt(c + d*x)/(a + b*exp(x))**2, x)
```

GIAC/XCAS [A] time = 0., size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.69 $\int \frac{\sqrt{c+dx}}{(a+be^x)^3}\,dx$

Optimal. Leaf size=22

$$\text{Int}\left(\frac{\sqrt{c+dx}}{(a+be^x)^3},x\right)$$

```
[Out] Unintegrable[Sqrt[c + d*x]/(a + b*E^x)^3, x]
```

Rubi [A] time = 0.0591047, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$

$$\text{Int}\left(\frac{\sqrt{c+dx}}{(a+be^x)^3},x\right)$$

Verification is Not applicable to the result.

```
[In]  Int[Sqrt[c + d*x]/(a + b*E^x)^3,x]

[Out] Defer[Int][Sqrt[c + d*x]/(a + b*E^x)^3, x]
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**(1/2)/(a+b*exp(x))**3,x)

[Out] Timed out
```

Mathematica [A] time = 1.06058, size = 0, normalized size = 0.

$$\int \frac{\sqrt{c+dx}}{(a+be^x)^3}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[c + d*x]/(a + b*E^x)^3,x]
```

```
[Out] Integrate[Sqrt[c + d*x]/(a + b*E^x)^3, x]
```

Maple [A] time = 0.075, size = 0, normalized size = 0.

$$\int \frac{1}{(a+be^{x})^{3}}\sqrt{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^(1/2)/(a+b*exp(x))^3,x)
```

```
[Out] int((d*x+c)^(1/2)/(a+b*exp(x))^3,x)
```

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

$$\int \frac{\sqrt{dx+c}}{(be^{x}+a)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{\sqrt{dx+c}}{b^{3}e^{(3\,x)}+3\,ab^{2}e^{(2\,x)}+3\,a^{2}be^{x}+a^{3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral(sqrt(d*x + c)/(b^3*e^(3*x) + 3*a*b^2*e^(2*x) + 3*a^2*b*e
^x + a^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**(1/2)/(a+b*exp(x))**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{dx + c}}{(be^x + a)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.70 $\int \left(a+b\left(F^{g(e+fx)}\right)^n\right)^3 (c+dx)^m \, dx$

Optimal. Leaf size=340

$$\frac{3a^2b(c+dx)^m \left(F^{eg+fgx}\right)^n F^{gn\left(e-\frac{cf}{d}\right)-gn(e+fx)} \left(-\frac{fgn\log(F)(c+dx)}{d}\right)^{-m} \text{Gamma}\left(m+1,-\frac{fgn\log(F)(c+dx)}{d}\right)}{fgn\log(F)} + \frac{3ab^2 2^{-m-1}(c+dx)^m \left(F^{eg+fgx}\right)^{2n} F^{2gn\left(e-\frac{cf}{d}\right)-2gn(e+fx)} \left(-\frac{fgn\log(F)(c+dx)}{d}\right)^{-m} \text{Gamma}\left(m+1,-\frac{2fgn\log(F)(c+dx)}{d}\right)}{fgn\log(F)} + \frac{b^3 3^{-m-1}(c+dx)^m \left(F^{eg+fgx}\right)^{3n} F^{3gn\left(e-\frac{cf}{d}\right)-3gn(e+fx)} \left(-\frac{fgn\log(F)(c+dx)}{d}\right)^{-m} \text{Gamma}\left(m+1,-\frac{3fgn\log(F)(c+dx)}{d}\right)}{fgn\log(F)} + \frac{a^3(c+dx)^{m+1}}{d(m+1)}$$

```
[Out] (a^3*(c + d*x)^(1 + m))/(d*(1 + m)) + (3^(-1 - m)*b^3*F^(3*(e - (
c*f)/d)*g*n - 3*g*n*(e + f*x))*(F^(e*g + f*g*x))^(3*n)*(c + d*x)^
m*Gamma[1 + m, (-3*f*g*n*(c + d*x)*Log[F])/d])/(f*g*n*Log[F]*(-((
f*g*n*(c + d*x)*Log[F])/d))^m) + (3*2^(-1 - m)*a*b^2*F^(2*(e - (c
*f)/d)*g*n - 2*g*n*(e + f*x))*(F^(e*g + f*g*x))^(2*n)*(c + d*x)^m
*Gamma[1 + m, (-2*f*g*n*(c + d*x)*Log[F])/d])/(f*g*n*Log[F]*(-((f
*g*n*(c + d*x)*Log[F])/d))^m) + (3*a^2*b*F^((e - (c*f)/d)*g*n - g
*n*(e + f*x))*(F^(e*g + f*g*x))^n*(c + d*x)^m*Gamma[1 + m, -((f*g
*n*(c + d*x)*Log[F])/d)])/(f*g*n*Log[F]*(-((f*g*n*(c + d*x)*Log[F
])/d))^m)
```

Rubi [A] time = 0.832698, antiderivative size = 340, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.12$

$$\frac{3a^2b(c+dx)^m \left(F^{eg+fgx}\right)^n F^{gn\left(e-\frac{cf}{d}\right)-gn(e+fx)} \left(-\frac{fgn\log(F)(c+dx)}{d}\right)^{-m} \text{Gamma}\left(m+1,-\frac{fgn\log(F)(c+dx)}{d}\right)}{fgn\log(F)} + \frac{3ab^2 2^{-m-1}(c+dx)^m \left(F^{eg+fgx}\right)^{2n} F^{2gn\left(e-\frac{cf}{d}\right)-2gn(e+fx)} \left(-\frac{fgn\log(F)(c+dx)}{d}\right)^{-m} \text{Gamma}\left(m+1,-\frac{2fgn\log(F)(c+dx)}{d}\right)}{fgn\log(F)} + \frac{b^3 3^{-m-1}(c+dx)^m \left(F^{eg+fgx}\right)^{3n} F^{3gn\left(e-\frac{cf}{d}\right)-3gn(e+fx)} \left(-\frac{fgn\log(F)(c+dx)}{d}\right)^{-m} \text{Gamma}\left(m+1,-\frac{3fgn\log(F)(c+dx)}{d}\right)}{fgn\log(F)} + \frac{a^3(c+dx)^{m+1}}{d(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)^3*(c + d*x)^m,x]
```

```
[Out] (a^3*(c + d*x)^(1 + m))/(d*(1 + m)) + (3^(-1 - m)*b^3*F^(3*(e - (
c*f)/d)*g*n - 3*g*n*(e + f*x))*(F^(e*g + f*g*x))^(3*n)*(c + d*x)^
m*Gamma[1 + m, (-3*f*g*n*(c + d*x)*Log[F])/d])/(f*g*n*Log[F]*(-((
f*g*n*(c + d*x)*Log[F])/d))^m) + (3*2^(-1 - m)*a*b^2*F^(2*(e - (c
*f)/d)*g*n - 2*g*n*(e + f*x))*(F^(e*g + f*g*x))^(2*n)*(c + d*x)^m
*Gamma[1 + m, (-2*f*g*n*(c + d*x)*Log[F])/d])/(f*g*n*Log[F]*(-((f
*g*n*(c + d*x)*Log[F])/d))^m) + (3*a^2*b*F^((e - (c*f)/d)*g*n - g
*n*(e + f*x))*(F^(e*g + f*g*x))^n*(c + d*x)^m*Gamma[1 + m, -((f*g
*n*(c + d*x)*Log[F])/d)])/(f*g*n*Log[F]*(-((f*g*n*(c + d*x)*Log[F
])/d))^m)
```

Rubi in Sympy [A] time = 77.9398, size = 333, normalized size = 0.98

$$\frac{F^{gn(-3e-3fx)}F^{-\frac{3gn(cf-de)}{d}}b^3\left(\frac{fgn(-3c-3dx)\log(F)}{d}\right)^{-m}(c+dx)^m\left(F^{g(e+fx)}\right)^{3n}\Gamma\left(m+1,\frac{fgn(-3c-3dx)\log(F)}{d}\right)}{3fgn\log(F)}$$
$$+\frac{3F^{gn(-2e-2fx)}F^{-\frac{2gn(cf-de)}{d}}ab^2\left(\frac{fgn(-2c-2dx)\log(F)}{d}\right)^{-m}(c+dx)^m\left(F^{g(e+fx)}\right)^{2n}\Gamma\left(m+1,\frac{fgn(-2c-2dx)\log(F)}{d}\right)}{2fgn\log(F)}$$
$$+\frac{3F^{gn(-e-fx)}F^{-\frac{gn(cf-de)}{d}}a^2b\left(\frac{fgn(-c-dx)\log(F)}{d}\right)^{-m}(c+dx)^m\left(F^{g(e+fx)}\right)^{n}\Gamma\left(m+1,\frac{fgn(-c-dx)\log(F)}{d}\right)}{fgn\log(F)}$$
$$+\frac{a^3(c+dx)^{m+1}}{d(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(F**(g*(f*x+e)))**n)**3*(d*x+c)**m,x)
```

```
[Out] F**(g*n*(-3*e - 3*f*x))*F**(-3*g*n*(c*f - d*e)/d)*b**3*(f*g*n*(-3
*c - 3*d*x)*log(F)/d)**(-m)*(c + d*x)**m*(F**(g*(e + f*x)))**(3*n
)*Gamma(m + 1, f*g*n*(-3*c - 3*d*x)*log(F)/d)/(3*f*g*n*log(F)) +
3*F**(g*n*(-2*e - 2*f*x))*F**(-2*g*n*(c*f - d*e)/d)*a*b**2*(f*g*n
*(-2*c - 2*d*x)*log(F)/d)**(-m)*(c + d*x)**m*(F**(g*(e + f*x)))**
(2*n)*Gamma(m + 1, f*g*n*(-2*c - 2*d*x)*log(F)/d)/(2*f*g*n*log(F)
) + 3*F**(g*n*(-e - f*x))*F**(-g*n*(c*f - d*e)/d)*a**2*b*(f*g*n*(
-c - d*x)*log(F)/d)**(-m)*(c + d*x)**m*(F**(g*(e + f*x)))**n*Gamm
a(m + 1, f*g*n*(-c - d*x)*log(F)/d)/(f*g*n*log(F)) + a**3*(c + d*
x)**(m + 1)/(d*(m + 1))
```

Mathematica [A] time = 0.258307, size = 0, normalized size = 0.

$$\int\left(a+b\left(F^{g(e+fx)}\right)^n\right)^3(c+dx)^m\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)^3*(c + d*x)^m,x]
```

```
[Out] Integrate[(a + b*(F^(g*(e + f*x)))^n)^3*(c + d*x)^m, x]
```

Maple [F] time = 0.064, size = 0, normalized size = 0.

$$\int \left(a + b\left(F^{g(fx+e)}\right)^{n}\right)^{3} (dx + c)^{m} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(F^(g*(f*x+e)))^n)^3*(d*x+c)^m,x)
```

```
[Out] int((a+b*(F^(g*(f*x+e)))^n)^3*(d*x+c)^m,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^3*(d*x + c)^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.280079, size = 365, normalized size = 1.07

$$\frac{18\left(a^{2}bdm + a^{2}bd\right)e^{\left(\frac{(de-cf)gn\log(F)-dm\log\left(-\frac{fgn\log(F)}{d}\right)}{d}\right)}\left(m + 1, -\frac{(dfgnx+cfgn)\log(F)}{d}\right) + 9\left(ab^{2}dm + ab^{2}d\right)e^{\left(\frac{2(de-cf)gn\log(F)-dm\log\left(-\frac{2fg\cdots}{}\right)}{d}\right)}\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^3*(d*x + c)^m,x, algorithm="fricas")
```

```
[Out] 1/6*(18*(a^2*b*d*m + a^2*b*d)*e^(((d*e - c*f)*g*n*log(F) - d*m*lo
g(-f*g*n*log(F)/d))/d)*gamma(m + 1, -(d*f*g*n*x + c*f*g*n)*log(F)
/d) + 9*(a*b^2*d*m + a*b^2*d)*e^((2*(d*e - c*f)*g*n*log(F) - d*m*
log(-2*f*g*n*log(F)/d))/d)*gamma(m + 1, -2*(d*f*g*n*x + c*f*g*n)*
log(F)/d) + 2*(b^3*d*m + b^3*d)*e^((3*(d*e - c*f)*g*n*log(F) - d*
m*log(-3*f*g*n*log(F)/d))/d)*gamma(m + 1, -3*(d*f*g*n*x + c*f*g*n
)*log(F)/d) + 6*(a^3*d*f*g*n*x + a^3*c*f*g*n)*(d*x + c)^m*log(F))
/((d*f*g*m + d*f*g)*n*log(F))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(F**(g*(f*x+e)))**n)**3*(d*x+c)**m,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(\left(F^{(fx+e)g}\right)^{n} b + a\right)^{3} (dx + c)^{m} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)^3*(d*x + c)^m,x, algorithm="giac")
```

```
[Out] integrate(((F^((f*x + e)*g))^n*b + a)^3*(d*x + c)^m, x)
```

3.71 $\int \left(a+b\left(F^{g(e+fx)}\right)^n\right)^2 (c+dx)^m\,dx$

Optimal. Leaf size=228

$$\frac{2ab(c+dx)^m\left(F^{eg+fgx}\right)^n F^{gn\left(e-\frac{cf}{d}\right)-gn(e+fx)}\left(-\frac{fgn\log(F)(c+dx)}{d}\right)^{-m}\text{Gamma}\left(m+1,-\frac{fgn\log(F)(c+dx)}{d}\right)}{fgn\log(F)}$$
$$+\frac{b^2 2^{-m-1}(c+dx)^m\left(F^{eg+fgx}\right)^{2n} F^{2gn\left(e-\frac{cf}{d}\right)-2gn(e+fx)}\left(-\frac{fgn\log(F)(c+dx)}{d}\right)^{-m}\text{Gamma}\left(m+1,-\frac{2fgn\log(F)(c+dx)}{d}\right)}{fgn\log(F)}$$
$$+\frac{a^2(c+dx)^{m+1}}{d(m+1)}$$

```
[Out] (a^2*(c + d*x)^(1 + m))/(d*(1 + m)) + (2^(-1 - m)*b^2*F^(2*(e - (
c*f)/d)*g*n - 2*g*n*(e + f*x))*(F^(e*g + f*g*x))^(2*n)*(c + d*x)^
m*Gamma[1 + m, (-2*f*g*n*(c + d*x)*Log[F])/d])/(f*g*n*Log[F]*(-((
f*g*n*(c + d*x)*Log[F])/d))^m) + (2*a*b*F^((e - (c*f)/d)*g*n - g*
n*(e + f*x))*(F^(e*g + f*g*x))^n*(c + d*x)^m*Gamma[1 + m, -((f*g*
n*(c + d*x)*Log[F])/d)])/(f*g*n*Log[F]*(-((f*g*n*(c + d*x)*Log[F]
)/d))^m)
```

Rubi [A] time = 0.498875, antiderivative size = 228, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.12$

$$\frac{2ab(c+dx)^m\left(F^{eg+fgx}\right)^n F^{gn\left(e-\frac{cf}{d}\right)-gn(e+fx)}\left(-\frac{fgn\log(F)(c+dx)}{d}\right)^{-m}\text{Gamma}\left(m+1,-\frac{fgn\log(F)(c+dx)}{d}\right)}{fgn\log(F)}$$
$$+\frac{b^2 2^{-m-1}(c+dx)^m\left(F^{eg+fgx}\right)^{2n} F^{2gn\left(e-\frac{cf}{d}\right)-2gn(e+fx)}\left(-\frac{fgn\log(F)(c+dx)}{d}\right)^{-m}\text{Gamma}\left(m+1,-\frac{2fgn\log(F)(c+dx)}{d}\right)}{fgn\log(F)}$$
$$+\frac{a^2(c+dx)^{m+1}}{d(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)^2*(c + d*x)^m,x]
```

```
[Out] (a^2*(c + d*x)^(1 + m))/(d*(1 + m)) + (2^(-1 - m)*b^2*F^(2*(e - (
c*f)/d)*g*n - 2*g*n*(e + f*x))*(F^(e*g + f*g*x))^(2*n)*(c + d*x)^
m*Gamma[1 + m, (-2*f*g*n*(c + d*x)*Log[F])/d])/(f*g*n*Log[F]*(-((
f*g*n*(c + d*x)*Log[F])/d))^m) + (2*a*b*F^((e - (c*f)/d)*g*n - g*
n*(e + f*x))*(F^(e*g + f*g*x))^n*(c + d*x)^m*Gamma[1 + m, -((f*g*
n*(c + d*x)*Log[F])/d)])/(f*g*n*Log[F]*(-((f*g*n*(c + d*x)*Log[F]
)/d))^m)
```

Rubi in Sympy [A] time = 50.2532, size = 219, normalized size = 0.96

$$\frac{F^{gn(-2e-2fx)}F^{-\frac{2gn(cf-de)}{d}}b^2\left(\frac{fgn(-2c-2dx)\log(F)}{d}\right)^{-m}(c+dx)^m\left(F^{g(e+fx)}\right)^{2n}\Gamma\left(m+1,\frac{fgn(-2c-2dx)\log(F)}{d}\right)}{2fgn\log(F)}$$
$$+\frac{2F^{gn(-e-fx)}F^{-\frac{gn(cf-de)}{d}}ab\left(\frac{fgn(-c-dx)\log(F)}{d}\right)^{-m}(c+dx)^m\left(F^{g(e+fx)}\right)^{n}\Gamma\left(m+1,\frac{fgn(-c-dx)\log(F)}{d}\right)}{fgn\log(F)}$$
$$+\frac{a^2(c+dx)^{m+1}}{d(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(F**(g*(f*x+e)))**n)**2*(d*x+c)**m,x)
```

```
[Out] F**(g*n*(-2*e - 2*f*x))*F**(-2*g*n*(c*f - d*e)/d)*b**2*(f*g*n*(-2
*c - 2*d*x)*log(F)/d)**(-m)*(c + d*x)**m*(F**(g*(e + f*x)))**(2*n
)*Gamma(m + 1, f*g*n*(-2*c - 2*d*x)*log(F)/d)/(2*f*g*n*log(F)) +
2*F**(g*n*(-e - f*x))*F**(-g*n*(c*f - d*e)/d)*a*b*(f*g*n*(-c - d*
x)*log(F)/d)**(-m)*(c + d*x)**m*(F**(g*(e + f*x)))**n*Gamma(m + 1
, f*g*n*(-c - d*x)*log(F)/d)/(f*g*n*log(F)) + a**2*(c + d*x)**(m
+ 1)/(d*(m + 1))
```

Mathematica [A] time = 0.200101, size = 0, normalized size = 0.

$$\int\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2(c+dx)^m\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)^2*(c + d*x)^m,x]
```

```
[Out] Integrate[(a + b*(F^(g*(e + f*x)))^n)^2*(c + d*x)^m, x]
```

Maple [F] time = 0.051, size = 0, normalized size = 0.

$$\int\left(a+b\left(F^{g(fx+e)}\right)^n\right)^2(dx+c)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(F^(g*(f*x+e)))^n)^2*(d*x+c)^m,x)
```

```
[Out] int((a+b*(F^(g*(f*x+e)))^n)^2*(d*x+c)^m,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^2*(d*x + c)^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.275973, size = 258, normalized size = 1.13

$$\frac{4\,(abdm+abd)e^{\left(\frac{(de-cf)gn\log(F)-dm\log\left(-\frac{fgn\log(F)}{d}\right)}{d}\right)}\left(m+1,-\frac{(dfgnx+cfgn)\log(F)}{d}\right)+\left(b^2dm+b^2d\right)e^{\left(\frac{2\,(de-cf)gn\log(F)-dm\log\left(-\frac{2\,fgn\log(F)}{d}\right)}{d}\right)}}{2\,(dfgm+dfg)n\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^2*(d*x + c)^m,x, algorithm="fricas")
```

```
[Out] 1/2*(4*(a*b*d*m + a*b*d)*e^(((d*e - c*f)*g*n*log(F) - d*m*log(-f*
g*n*log(F)/d))/d)*gamma(m + 1, -(d*f*g*n*x + c*f*g*n)*log(F)/d) +
 (b^2*d*m + b^2*d)*e^((2*(d*e - c*f)*g*n*log(F) - d*m*log(-2*f*g*
n*log(F)/d))/d)*gamma(m + 1, -2*(d*f*g*n*x + c*f*g*n)*log(F)/d) +
 2*(a^2*d*f*g*n*x + a^2*c*f*g*n)*(d*x + c)^m*log(F))/((d*f*g*m +
d*f*g)*n*log(F))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(F**(g*(f*x+e)))**n)**2*(d*x+c)**m,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(\left(F^{(fx+e)g}\right)^n b + a\right)^2 (dx + c)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^2*(d*x + c)^m,x, algorithm="giac")
```

```
[Out] integrate(((F^((f*x + e)*g))^n*b + a)^2*(d*x + c)^m, x)
```

3.72 $\int \left(a+b \left(F^{g(e+f x)}\right)^n\right) (c+d x)^m \, dx$

Optimal. Leaf size=116

$$\frac{b(c+dx)^m \left(F^{eg+fgx}\right)^n F^{gn\left(e-\frac{cf}{d}\right)-gn(e+fx)} \left(-\frac{fgn\log(F)(c+dx)}{d}\right)^{-m} \text{Gamma}\left(m+1,-\frac{fgn\log(F)(c+dx)}{d}\right)}{fgn\log(F)} + \frac{a(c+dx)^{m+1}}{d(m+1)}$$

```
[Out] (a*(c + d*x)^(1 + m))/(d*(1 + m)) + (b*F^((e - (c*f)/d)*g*n - g*n
*(e + f*x))*(F^(e*g + f*g*x))^n*(c + d*x)^m*Gamma[1 + m, -((f*g*n
*(c + d*x)*Log[F])/d)])/(f*g*n*Log[F]*(-((f*g*n*(c + d*x)*Log[F])
/d))^m)
```

Rubi [A] time = 0.239244, antiderivative size = 116, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.13$

$$\frac{b(c+dx)^m \left(F^{eg+fgx}\right)^n F^{gn\left(e-\frac{cf}{d}\right)-gn(e+fx)} \left(-\frac{fgn\log(F)(c+dx)}{d}\right)^{-m} \text{Gamma}\left(m+1,-\frac{fgn\log(F)(c+dx)}{d}\right)}{fgn\log(F)} + \frac{a(c+dx)^{m+1}}{d(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)*(c + d*x)^m,x]
```

```
[Out] (a*(c + d*x)^(1 + m))/(d*(1 + m)) + (b*F^((e - (c*f)/d)*g*n - g*n
*(e + f*x))*(F^(e*g + f*g*x))^n*(c + d*x)^m*Gamma[1 + m, -((f*g*n
*(c + d*x)*Log[F])/d)])/(f*g*n*Log[F]*(-((f*g*n*(c + d*x)*Log[F])
/d))^m)
```

Rubi in Sympy [A] time = 22.9806, size = 105, normalized size = 0.91

$$\frac{F^{gn(-e-fx)}F^{-\frac{gn(cf-de)}{d}} b \left(\frac{fgn(-c-dx)\log(F)}{d}\right)^{-m} (c+dx)^m \left(F^{g(e+fx)}\right)^n \left(m+1, \frac{fgn(-c-dx)\log(F)}{d}\right)}{fgn\log(F)} + \frac{a(c+dx)^{m+1}}{d(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(F**(g*(f*x+e)))**n)*(d*x+c)**m,x)
```

```
[Out] F**(g*n*(-e - f*x))*F**(-g*n*(c*f - d*e)/d)*b*(f*g*n*(-c - d*x)*l
og(F)/d)**(-m)*(c + d*x)**m*(F**(g*(e + f*x)))**n*Gamma(m + 1, f*
g*n*(-c - d*x)*log(F)/d)/(f*g*n*log(F)) + a*(c + d*x)**(m + 1)/(d
*(m + 1))
```

Mathematica [A] time = 0.145095, size = 0, normalized size = 0.

$$\int \left(a+b\left(F^{g(e+fx)}\right)^n\right)(c+dx)^m\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)*(c + d*x)^m,x]
```

```
[Out] Integrate[(a + b*(F^(g*(e + f*x)))^n)*(c + d*x)^m, x]
```

Maple [F] time = 0.052, size = 0, normalized size = 0.

$$\int \left(a+b\left(F^{g(fx+e)}\right)^n\right)(dx+c)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(F^(g*(f*x+e)))^n)*(d*x+c)^m,x)
```

```
[Out] int((a+b*(F^(g*(f*x+e)))^n)*(d*x+c)^m,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)*(d*x + c)^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.271062, size = 150, normalized size = 1.29

$$\frac{(bdm+bd)e^{\left(\frac{(de-cf)gn\log(F)-dm\log\left(-\frac{fgn\log(F)}{d}\right)}{d}\right)}\Gamma\left(m+1,-\frac{(dfgnx+cfgn)\log(F)}{d}\right)+(adfgnx+acfgn)(dx+c)^m\log(F)}{(dfgm+dfg)n\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)*(d*x + c)^m,x, algorithm="fricas")
```

```
[Out] ((b*d*m + b*d)*e^(((d*e - c*f)*g*n*log(F) - d*m*log(-f*g*n*log(F)
/d))/d)*gamma(m + 1, -(d*f*g*n*x + c*f*g*n)*log(F)/d) + (a*d*f*g*
n*x + a*c*f*g*n)*(d*x + c)^m*log(F))/((d*f*g*m + d*f*g)*n*log(F))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*(F**(g*(f*x+e)))**n)*(d*x+c)**m,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(\left(F^{(fx+e)g}\right)^n b + a\right)(dx+c)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)*(d*x + c)^m,x, algorithm="giac")
```

```
[Out] integrate(((F^((f*x + e)*g))^n*b + a)*(d*x + c)^m, x)
```

3.73 $\int \frac{(c+dx)^m}{a+b\left(F^{g(e+fx)}\right)^n} \, dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{(c+dx)^m}{a+b\left(F^{eg+fgx}\right)^n},x\right)$$

```
[Out] Unintegrable[(c + d*x)^m/(a + b*(F^(e*g + f*g*x))^n), x]
```

Rubi [A] time = 0.180652, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$

$$\text{Int}\left(\frac{(c+dx)^m}{a+b\left(F^{g(e+fx)}\right)^n},x\right)$$

Verification is Not applicable to the result.

```
[In]  Int[(c + d*x)^m/(a + b*(F^(g*(e + f*x)))^n),x]
```

```
[Out] Defer[Int][(c + d*x)^m/(a + b*(F^(e*g + f*g*x))^n), x]
```

Rubi in Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(c+dx)^m}{a+b\left(F^{eg+fgx}\right)^n} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**m/(a+b*(F**(g*(f*x+e)))**n),x)
```

```
[Out] Integral((c + d*x)**m/(a + b*(F**(e*g + f*g*x))**n), x)
```

Mathematica [A] time = 0.10983, size = 0, normalized size = 0.

$$\int \frac{(c+dx)^m}{a+b\left(F^{g(e+fx)}\right)^n} \, dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(c + d*x)^m/(a + b*(F^(g*(e + f*x)))^n),x]

[Out] Integrate[(c + d*x)^m/(a + b*(F^(g*(e + f*x)))^n), x]
```

Maple [A] time = 0.08, size = 0, normalized size = 0.

$$\int \frac{(dx+c)^m}{a+b\left(F^{g(fx+e)}\right)^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^m/(a+b*(F^(g*(f*x+e)))^n),x)

[Out] int((d*x+c)^m/(a+b*(F^(g*(f*x+e)))^n),x)
```

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

$$\int \frac{(dx+c)^m}{\left(F^{(fx+e)g}\right)^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^m/((F^((f*x + e)*g))^n*b + a),x, algorithm="maxima")

[Out] integrate((d*x + c)^m/((F^((f*x + e)*g))^n*b + a), x)
```

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

$$\mathrm{integral}\left(\frac{(dx+c)^m}{\left(F^{fgx+eg}\right)^n b+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^m/((F^((f*x + e)*g))^n*b + a),x, algorithm="fricas")

[Out] integral((d*x + c)^m/((F^(f*g*x + e*g))^n*b + a), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**m/(a+b*(F**(g*(f*x+e)))**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx+c)^m}{\left(F^{(fx+e)g}\right)^n b + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x + c)^m/((F^((f*x + e)*g))^n*b + a),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^m/((F^((f*x + e)*g))^n*b + a), x)
```

3.74 $\int \frac{(c+dx)^m}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2} \, dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{(c+dx)^m}{\left(a+b\left(F^{eg+fgx}\right)^n\right)^2},x\right)$$

```
[Out] Unintegrable[(c + d*x)^m/(a + b*(F^(e*g + f*g*x))^n)^2, x]
```

Rubi [A] time = 0.173262, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$

$$\text{Int}\left(\frac{(c+dx)^m}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2},x\right)$$

Verification is Not applicable to the result.

```
[In]  Int[(c + d*x)^m/(a + b*(F^(g*(e + f*x)))^n)^2,x]

[Out] Defer[Int][(c + d*x)^m/(a + b*(F^(e*g + f*g*x))^n)^2, x]
```

Rubi in Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(c+dx)^m}{\left(a+b\left(F^{eg+fgx}\right)^n\right)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**m/(a+b*(F**(g*(f*x+e)))**n)**2,x)

[Out] Integral((c + d*x)**m/(a + b*(F**(e*g + f*g*x))**n)**2, x)
```

Mathematica [A] time = 0.147982, size = 0, normalized size = 0.

$$\int \frac{(c+dx)^m}{\left(a+b\left(F^{g(e+fx)}\right)^n\right)^2} \, dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(c + d*x)^m/(a + b*(F^(g*(e + f*x)))^n)^2,x]
```

```
[Out] Integrate[(c + d*x)^m/(a + b*(F^(g*(e + f*x)))^n)^2, x]
```

Maple [A] time = 0.333, size = 0, normalized size = 0.

$$\int \frac{(dx+c)^m}{\left(a+b\left(F^{g(fx+e)}\right)^n\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^m/(a+b*(F^(g*(f*x+e)))^n)^2,x)
```

```
[Out] int((d*x+c)^m/(a+b*(F^(g*(f*x+e)))^n)^2,x)
```

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

$$\frac{(dx+c)^m}{\left(F^{fgx}\right)^n(F^{eg})^n abfgn\log(F)+a^2fgn\log(F)} + \int \frac{(dfgnx\log(F)+cfgn\log(F)-dm)(dx+c)^m}{a^2dfgnx\log(F)+a^2cfgn\log(F)+((F^{eg})^n abdfgnx\log(F)+(F^{eg})^n abcfgn\log(F))\left(F^{fgx}\right)^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^m/((F^((f*x + e)*g))^n*b + a)^2,x, algorithm="maxima")
```

```
[Out] (d*x + c)^m/((F^(f*g*x))^n*(F^(e*g))^n*a*b*f*g*n*log(F) + a^2*f*g
*n*log(F)) + integrate((d*f*g*n*x*log(F) + c*f*g*n*log(F) - d*m)*
(d*x + c)^m/(a^2*d*f*g*n*x*log(F) + a^2*c*f*g*n*log(F) + ((F^(e*g
))^n*a*b*d*f*g*n*x*log(F) + (F^(e*g))^n*a*b*c*f*g*n*log(F))*(F^(f
*g*x))^n), x)
```

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

$$\mathrm{integral}\left(\frac{(dx+c)^m}{2\left(F^{fgx+eg}\right)^n ab+\left(F^{fgx+eg}\right)^{2n}b^2+a^2},\,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^m/((F^((f*x + e)*g))^n*b + a)^2,x, algorithm="fricas")
```

```
[Out] integral((d*x + c)^m/(2*(F^(f*g*x + e*g))^n*a*b + (F^(f*g*x + e*g
))^(2*n)*b^2 + a^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**m/(a+b*(F**(g*(f*x+e)))**n)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx + c)^m}{\left(\left(F^{(fx+e)g}\right)^n b + a\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^m/((F^((f*x + e)*g))^n*b + a)^2,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^m/((F^((f*x + e)*g))^n*b + a)^2, x)
```

3.75 $\int \left(a+b\left(F^{g(e+fx)}\right)^n\right)^p (c+dx)^m \, dx$

Optimal. Leaf size=29

$$\text{Int}\left((c+dx)^m\left(a+b\left(F^{eg+fgx}\right)^n\right)^p,x\right)$$

```
[Out] Unintegrable[(a + b*(F^(e*g + f*g*x))^n)^p*(c + d*x)^m, x]
```

Rubi [A] time = 0.172348, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$

$$\text{Int}\left(\left(a+b\left(F^{g(e+fx)}\right)^n\right)^p (c+dx)^m,x\right)$$

Verification is Not applicable to the result.

```
[In]  Int[(a + b*(F^(g*(e + f*x)))^n)^p*(c + d*x)^m,x]

[Out] Defer[Int][(a + b*(F^(e*g + f*g*x))^n)^p*(c + d*x)^m, x]
```

Rubi in Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \left(a+b\left(F^{eg+fgx}\right)^n\right)^p (c+dx)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(F**(g*(f*x+e)))**n)**p*(d*x+c)**m,x)

[Out] Integral((a + b*(F**(e*g + f*g*x))**n)**p*(c + d*x)**m, x)
```

Mathematica [A] time = 0.354327, size = 0, normalized size = 0.

$$\int \left(a+b\left(F^{g(e+fx)}\right)^n\right)^p (c+dx)^m \, dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(a + b*(F^(g*(e + f*x)))^n)^p*(c + d*x)^m,x]

[Out] Integrate[(a + b*(F^(g*(e + f*x)))^n)^p*(c + d*x)^m, x]
```

Maple [A] time = 0.246, size = 0, normalized size = 0.

$$\int \left(a+b\left(F^{g(fx+e)}\right)^{n}\right)^{p}(dx+c)^{m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(F^(g*(f*x+e)))^n)^p*(d*x+c)^m,x)

[Out] int((a+b*(F^(g*(f*x+e)))^n)^p*(d*x+c)^m,x)
```

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

$$\int \left(\left(F^{(fx+e)g}\right)^{n}b+a\right)^{p}(dx+c)^{m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)^p*(d*x + c)^m,x, algorithm="maxima")

[Out] integrate(((F^((f*x + e)*g))^n*b + a)^p*(d*x + c)^m, x)
```

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

$$\text{integral}\left(\left(\left(F^{fgx+eg}\right)^{n}b+a\right)^{p}(dx+c)^{m},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((F^((f*x + e)*g))^n*b + a)^p*(d*x + c)^m,x, algorithm="fricas")

[Out] integral(((F^(f*g*x + e*g))^n*b + a)^p*(d*x + c)^m, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(F**(g*(f*x+e)))**n)**p*(d*x+c)**m,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0., size = 0, normalized size = 0.

$$\int \left(\left(F^{(fx+e)g}\right)^n b + a\right)^p (dx + c)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((F^((f*x + e)*g))^n*b + a)^p*(d*x + c)^m,x, algorithm="giac")
```

```
[Out] integrate(((F^((f*x + e)*g))^n*b + a)^p*(d*x + c)^m, x)
```

3.76 $\int \frac{F^{c+dx}x^3}{a+bF^{c+dx}}\,dx$

Optimal. Leaf size=115

$$\frac{6\text{PolyLog}\left(4,-\frac{bF^{c+dx}}{a}\right)}{bd^4\log^4(F)}-\frac{6x\text{PolyLog}\left(3,-\frac{bF^{c+dx}}{a}\right)}{bd^3\log^3(F)}+\frac{3x^2\text{PolyLog}\left(2,-\frac{bF^{c+dx}}{a}\right)}{bd^2\log^2(F)}+\frac{x^3\log\left(\frac{bF^{c+dx}}{a}+1\right)}{bd\log(F)}$$

```
[Out] (x^3*Log[1 + (b*F^(c + d*x))/a])/(b*d*Log[F]) + (3*x^2*PolyLog[2,
 -((b*F^(c + d*x))/a)])/(b*d^2*Log[F]^2) - (6*x*PolyLog[3, -((b*F
^(c + d*x))/a)])/(b*d^3*Log[F]^3) + (6*PolyLog[4, -((b*F^(c + d*x
))/a)])/(b*d^4*Log[F]^4)
```

Rubi [A] time = 0.216895, antiderivative size = 115, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208

$$\frac{6\text{PolyLog}\left(4,-\frac{bF^{c+dx}}{a}\right)}{bd^4\log^4(F)}-\frac{6x\text{PolyLog}\left(3,-\frac{bF^{c+dx}}{a}\right)}{bd^3\log^3(F)}+\frac{3x^2\text{PolyLog}\left(2,-\frac{bF^{c+dx}}{a}\right)}{bd^2\log^2(F)}+\frac{x^3\log\left(\frac{bF^{c+dx}}{a}+1\right)}{bd\log(F)}$$

Antiderivative was successfully verified.

```
[In]  Int[(F^(c + d*x)*x^3)/(a + b*F^(c + d*x)),x]
```

```
[Out] (x^3*Log[1 + (b*F^(c + d*x))/a])/(b*d*Log[F]) + (3*x^2*PolyLog[2,
 -((b*F^(c + d*x))/a)])/(b*d^2*Log[F]^2) - (6*x*PolyLog[3, -((b*F
^(c + d*x))/a)])/(b*d^3*Log[F]^3) + (6*PolyLog[4, -((b*F^(c + d*x
))/a)])/(b*d^4*Log[F]^4)
```

Rubi in Sympy [A] time = 32.533, size = 104, normalized size = 0.9

$$\frac{x^3\log\left(\frac{F^{c+dx}b}{a}+1\right)}{bd\log(F)}+\frac{3x^2\,\text{Li}_2\left(-\frac{F^{c+dx}b}{a}\right)}{bd^2\log(F)^2}-\frac{6x\,\text{Li}_3\left(-\frac{F^{c+dx}b}{a}\right)}{bd^3\log(F)^3}+\frac{6\,\text{Li}_4\left(-\frac{F^{c+dx}b}{a}\right)}{bd^4\log(F)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(F**(d*x+c)*x**3/(a+b*F**(d*x+c)),x)
```

```
[Out] x**3*log(F**(c + d*x)*b/a + 1)/(b*d*log(F)) + 3*x**2*polylog(2, -
F**(c + d*x)*b/a)/(b*d**2*log(F)**2) - 6*x*polylog(3, -F**(c + d*
x)*b/a)/(b*d**3*log(F)**3) + 6*polylog(4, -F**(c + d*x)*b/a)/(b*d
```

```
**4*log(F)**4)
```

Mathematica [A] time = 0.0513483, size = 103, normalized size = 0.9

$$\frac{3d^2x^2\log^2(F)\text{PolyLog}\left(2,-\frac{bF^{c+dx}}{a}\right)+6\text{PolyLog}\left(4,-\frac{bF^{c+dx}}{a}\right)-6dx\log(F)\text{PolyLog}\left(3,-\frac{bF^{c+dx}}{a}\right)+d^3x^3\log^3(F)\log\left(\frac{bF^{c+dx}}{a}\right.}{bd^4\log^4(F)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(F^(c + d*x)*x^3)/(a + b*F^(c + d*x)),x]
```

```
[Out] (d^3*x^3*Log[F]^3*Log[1 + (b*F^(c + d*x))/a] + 3*d^2*x^2*Log[F]^2
*PolyLog[2, -((b*F^(c + d*x))/a)] - 6*d*x*Log[F]*PolyLog[3, -((b*
F^(c + d*x))/a)] + 6*PolyLog[4, -((b*F^(c + d*x))/a)])/(b*d^4*Log
[F]^4)
```

Maple [A] time = 0.04, size = 217, normalized size = 1.9

$$-\frac{c^3x}{bd^3}-\frac{3\,c^4}{4\,bd^4}+\frac{x^3}{bd\ln(F)}\ln\left(1+\frac{bF^{dx+c}}{a}\right)+\frac{c^3}{d^4\ln(F)\,b}\ln\left(1+\frac{bF^{dx+c}}{a}\right)$$
$$+3\,\frac{x^2}{bd^2(\ln(F))^2}\mathit{polylog}\left(2,-\frac{bF^{dx+c}}{a}\right)-6\,\frac{x}{bd^3(\ln(F))^3}\mathit{polylog}\left(3,-\frac{bF^{dx+c}}{a}\right)$$
$$+6\,\frac{1}{bd^4(\ln(F))^4}\mathit{polylog}\left(4,-\frac{bF^{dx+c}}{a}\right)+\frac{c^3\ln\left(F^{dx+c}\right)}{d^4\ln(F)\,b}-\frac{c^3\ln\left(a+bF^{dx+c}\right)}{d^4\ln(F)\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(F^(d*x+c)*x^3/(a+b*F^(d*x+c)),x)
```

```
[Out] -1/d^3/b*c^3*x-3/4/d^4/b*c^4+x^3*ln(1+b*F^(d*x+c)/a)/b/d/ln(F)+1/
d^4/ln(F)/b*ln(1+b*F^(d*x+c)/a)*c^3+3*x^2*polylog(2,-b*F^(d*x+c)/
a)/b/d^2/ln(F)^2-6*x*polylog(3,-b*F^(d*x+c)/a)/b/d^3/ln(F)^3+6*po
lylog(4,-b*F^(d*x+c)/a)/b/d^4/ln(F)^4+1/d^4/ln(F)/b*c^3*ln(F^(d*x
+c))-1/d^4/ln(F)/b*c^3*ln(a+b*F^(d*x+c))
```

Maxima [A] time = 0.815698, size = 180, normalized size = 1.57

$$\frac{x^4}{4\,b} - \frac{\log\left(F^{dx}\right)^4}{4\,bd^4\log\left(F\right)^4} + \frac{\log\left(\frac{F^{dx}F^cb}{a}+1\right)\log\left(F^{dx}\right)^3 + 3\,\mathrm{Li}_2\left(-\frac{F^{dx}F^cb}{a}\right)\log\left(F^{dx}\right)^2 - 6\,\log\left(F^{dx}\right)\mathrm{Li}_3\left(-\frac{F^{dx}F^cb}{a}\right) + 6\,\mathrm{Li}_4\left(-\frac{F^{dx}F^cb}{a}\right)}{bd^4\log\left(F\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*x^4/b - 1/4*log(F^(d*x))^4/(b*d^4*log(F)^4) + (log(F^(d*x)*F^
c*b/a + 1)*log(F^(d*x))^3 + 3*dilog(-F^(d*x)*F^c*b/a)*log(F^(d*x)
)^2 - 6*log(F^(d*x))*polylog(3, -F^(d*x)*F^c*b/a) + 6*polylog(4,
-F^(d*x)*F^c*b/a))/(b*d^4*log(F)^4)
```

Fricas [A] time = 0.300729, size = 181, normalized size = 1.57

$$\frac{3\,d^2x^2\mathrm{Li}_2\left(-\frac{F^{dx+c}b+a}{a}+1\right)\log\left(F\right)^2 - c^3\log\left(F^{dx+c}b+a\right)\log\left(F\right)^3 + \left(d^3x^3+c^3\right)\log\left(F\right)^3\log\left(\frac{F^{dx+c}b+a}{a}\right) - 6\,dx\log\left(F\right)\mathrm{Li}_3(-}{bd^4\log\left(F\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (3*d^2*x^2*dilog(-(F^(d*x + c)*b + a)/a + 1)*log(F)^2 - c^3*log(F
^(d*x + c)*b + a)*log(F)^3 + (d^3*x^3 + c^3)*log(F)^3*log((F^(d*x
 + c)*b + a)/a) - 6*d*x*log(F)*polylog(3, -F^(d*x + c)*b/a) + 6*p
olylog(4, -F^(d*x + c)*b/a))/(b*d^4*log(F)^4)
```

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

$$\int \frac{F^{c+dx}x^3}{F^cF^{dx}b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(F**(d*x+c)*x**3/(a+b*F**(d*x+c)),x)
```

```
[Out] Integral(F**(c + d*x)*x**3/(F**c*F**(d*x)*b + a), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{F^{dx+c}x^3}{F^{dx+c}b + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(F^(d*x + c)*x^3/(F^(d*x + c)*b + a), x)
```

3.77 $\int \frac{F^{c+dx}x^2}{a+bF^{c+dx}}\,dx$

Optimal. Leaf size=85

$$-\frac{2\text{PolyLog}\left(3,-\frac{bF^{c+dx}}{a}\right)}{bd^3\log^3(F)}+\frac{2x\text{PolyLog}\left(2,-\frac{bF^{c+dx}}{a}\right)}{bd^2\log^2(F)}+\frac{x^2\log\left(\frac{bF^{c+dx}}{a}+1\right)}{bd\log(F)}$$

```
[Out] (x^2*Log[1 + (b*F^(c + d*x))/a])/(b*d*Log[F]) + (2*x*PolyLog[2, -
((b*F^(c + d*x))/a)])/(b*d^2*Log[F]^2) - (2*PolyLog[3, -((b*F^(c
+ d*x))/a)])/(b*d^3*Log[F]^3)
```

Rubi [A] time = 0.180457, antiderivative size = 85, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167

$$-\frac{2\text{PolyLog}\left(3,-\frac{bF^{c+dx}}{a}\right)}{bd^3\log^3(F)}+\frac{2x\text{PolyLog}\left(2,-\frac{bF^{c+dx}}{a}\right)}{bd^2\log^2(F)}+\frac{x^2\log\left(\frac{bF^{c+dx}}{a}+1\right)}{bd\log(F)}$$

Antiderivative was successfully verified.

```
[In]  Int[(F^(c + d*x)*x^2)/(a + b*F^(c + d*x)),x]
```

```
[Out] (x^2*Log[1 + (b*F^(c + d*x))/a])/(b*d*Log[F]) + (2*x*PolyLog[2, -
((b*F^(c + d*x))/a)])/(b*d^2*Log[F]^2) - (2*PolyLog[3, -((b*F^(c
+ d*x))/a)])/(b*d^3*Log[F]^3)
```

Rubi in Sympy [A] time = 27.0571, size = 75, normalized size = 0.88

$$\frac{x^2\log\left(\frac{F^{c+dx}b}{a}+1\right)}{bd\log(F)}+\frac{2x\,\text{Li}_2\left(-\frac{F^{c+dx}b}{a}\right)}{bd^2\log(F)^2}-\frac{2\,\text{Li}_3\left(-\frac{F^{c+dx}b}{a}\right)}{bd^3\log(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(F**(d*x+c)*x**2/(a+b*F**(d*x+c)),x)
```

```
[Out] x**2*log(F**(c + d*x)*b/a + 1)/(b*d*log(F)) + 2*x*polylog(2, -F**
(c + d*x)*b/a)/(b*d**2*log(F)**2) - 2*polylog(3, -F**(c + d*x)*b/
a)/(b*d**3*log(F)**3)
```

Mathematica [A] time = 0.026804, size = 76, normalized size = 0.89

$$\frac{-2\text{PolyLog}\left(3,-\frac{bF^{c+dx}}{a}\right)+2dx\log(F)\text{PolyLog}\left(2,-\frac{bF^{c+dx}}{a}\right)+d^2x^2\log^2(F)\log\left(\frac{bF^{c+dx}}{a}+1\right)}{bd^3\log^3(F)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(F^(c + d*x)*x^2)/(a + b*F^(c + d*x)),x]
```

```
[Out] (d^2*x^2*Log[F]^2*Log[1 + (b*F^(c + d*x))/a] + 2*d*x*Log[F]*PolyL
og[2, -((b*F^(c + d*x))/a)] - 2*PolyLog[3, -((b*F^(c + d*x))/a)])
/(b*d^3*Log[F]^3)
```

Maple [B] time = 0.026, size = 187, normalized size = 2.2

$$\frac{c^2x}{bd^2}+\frac{2\,c^3}{3\,bd^3}+\frac{x^2}{bd\ln(F)}\ln\left(1+\frac{bF^{dx+c}}{a}\right)-\frac{c^2}{d^3\ln(F)\,b}\ln\left(1+\frac{bF^{dx+c}}{a}\right)+2\,\frac{x}{bd^2\left(\ln(F)\right)^2}\mathit{polylog}\left(2,-\frac{bF^{dx+c}}{a}\right)-2\,\frac{1}{bd^3\left(\ln(F)\right)^3}\mathit{polylog}\left(3,-\frac{bF^{dx+c}}{a}\right)-\frac{c^2\ln\left(F^{dx+c}\right)}{d^3\ln(F)\,b}+\frac{c^2\ln\left(a+bF^{dx+c}\right)}{d^3\ln(F)\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(F^(d*x+c)*x^2/(a+b*F^(d*x+c)),x)
```

```
[Out] 1/d^2/b*c^2*x+2/3/d^3/b*c^3+x^2*ln(1+b*F^(d*x+c)/a)/b/d/ln(F)-1/d
^3/ln(F)/b*ln(1+b*F^(d*x+c)/a)*c^2+2*x*polylog(2,-b*F^(d*x+c)/a)/
b/d^2/ln(F)^2-2*polylog(3,-b*F^(d*x+c)/a)/b/d^3/ln(F)^3-1/d^3/ln(
F)/b*c^2*ln(F^(d*x+c))+1/d^3/ln(F)/b*c^2*ln(a+b*F^(d*x+c))
```

Maxima [A] time = 0.82654, size = 144, normalized size = 1.69

$$\frac{x^3}{3\,b}-\frac{\log\left(F^{dx}\right)^3}{3\,bd^3\log(F)^3}+\frac{\log\left(\frac{F^{dx}F^cb}{a}+1\right)\log\left(F^{dx}\right)^2+2\,\mathrm{Li}_2\left(-\frac{F^{dx}F^cb}{a}\right)\log\left(F^{dx}\right)-2\,\mathrm{Li}_3(-\frac{F^{dx}F^cb}{a})}{bd^3\log(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*x^3/b - 1/3*log(F^(d*x))^3/(b*d^3*log(F)^3) + (log(F^(d*x)*F^
c*b/a + 1)*log(F^(d*x))^2 + 2*dilog(-F^(d*x)*F^c*b/a)*log(F^(d*x)
) - 2*polylog(3, -F^(d*x)*F^c*b/a))/(b*d^3*log(F)^3)
```

Fricas [A] time = 0.286924, size = 146, normalized size = 1.72

$$\frac{c^2 \log\left(F^{dx+c}b + a\right) \log(F)^2 + 2\,dx\mathrm{Li}_2\left(-\frac{F^{dx+c}b+a}{a} + 1\right) \log(F) + \left(d^2x^2 - c^2\right) \log(F)^2 \log\left(\frac{F^{dx+c}b+a}{a}\right) - 2\,\mathrm{Li}_3(-\frac{F^{dx+c}b}{a})}{bd^3 \log(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (c^2*log(F^(d*x + c)*b + a)*log(F)^2 + 2*d*x*dilog(-(F^(d*x + c)*
b + a)/a + 1)*log(F) + (d^2*x^2 - c^2)*log(F)^2*log((F^(d*x + c)*
b + a)/a) - 2*polylog(3, -F^(d*x + c)*b/a))/(b*d^3*log(F)^3)
```

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

$$\int \frac{F^{c+dx}x^2}{F^cF^{dx}b + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(d*x+c)*x**2/(a+b*F**(d*x+c)),x)
```

```
[Out] Integral(F**(c + d*x)*x**2/(F**c*F**(d*x)*b + a), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{F^{dx+c}x^2}{F^{dx+c}b + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(F^(d*x + c)*x^2/(F^(d*x + c)*b + a), x)
```

3.78 $\int \frac{F^{c+dx}x}{a+bF^{c+dx}}\,dx$

Optimal. Leaf size=54

$$\frac{\text{PolyLog}\left(2,-\frac{bF^{c+dx}}{a}\right)}{bd^2\log^2(F)}+\frac{x\log\left(\frac{bF^{c+dx}}{a}+1\right)}{bd\log(F)}$$

```
[Out] (x*Log[1 + (b*F^(c + d*x))/a])/(b*d*Log[F]) + PolyLog[2, -((b*F^(
c + d*x))/a)]/(b*d^2*Log[F]^2)
```

Rubi [A] time = 0.105195, antiderivative size = 54, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136

$$\frac{\text{PolyLog}\left(2,-\frac{bF^{c+dx}}{a}\right)}{bd^2\log^2(F)}+\frac{x\log\left(\frac{bF^{c+dx}}{a}+1\right)}{bd\log(F)}$$

Antiderivative was successfully verified.

```
[In]  Int[(F^(c + d*x)*x)/(a + b*F^(c + d*x)),x]
```

```
[Out] (x*Log[1 + (b*F^(c + d*x))/a])/(b*d*Log[F]) + PolyLog[2, -((b*F^(
c + d*x))/a)]/(b*d^2*Log[F]^2)
```

Rubi in Sympy [A] time = 18.6001, size = 44, normalized size = 0.81

$$\frac{x\log\left(\frac{F^{c+dx}b}{a}+1\right)}{bd\log\left(F\right)}+\frac{\text{Li}_2\left(-\frac{F^{c+dx}b}{a}\right)}{bd^2\log\left(F\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(F**(d*x+c)*x/(a+b*F**(d*x+c)),x)
```

```
[Out] x*log(F**(c + d*x)*b/a + 1)/(b*d*log(F)) + polylog(2, -F**(c + d*
x)*b/a)/(b*d**2*log(F)**2)
```

Mathematica [A] time = 0.0228365, size = 47, normalized size = 0.87

$$\frac{\text{PolyLog}\left(2,-\frac{bF^{c+dx}}{a}\right)+dx\log(F)\log\left(\frac{bF^{c+dx}}{a}+1\right)}{bd^2\log^2(F)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(F^(c + d*x)*x)/(a + b*F^(c + d*x)),x]
```

```
[Out] (d*x*Log[F]*Log[1 + (b*F^(c + d*x))/a] + PolyLog[2, -((b*F^(c + d
*x))/a)])/(b*d^2*Log[F]^2)
```

Maple [B] time = 0.023, size = 148, normalized size = 2.7

$$-\frac{cx}{bd}-\frac{c^2}{2\,bd^2}+\frac{x}{bd\ln(F)}\ln\left(1+\frac{bF^{dx+c}}{a}\right)+\frac{c}{d^2\ln(F)\,b}\ln\left(1+\frac{bF^{dx+c}}{a}\right)+\frac{1}{bd^2\left(\ln(F)\right)^2}\mathit{polylog}\left(2,-\frac{bF^{dx+c}}{a}\right)+\frac{c\ln\left(F^{dx+c}\right)}{d^2\ln(F)\,b}-\frac{c\ln\left(a+bF^{dx+c}\right)}{d^2\ln(F)\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(F^(d*x+c)*x/(a+b*F^(d*x+c)),x)
```

```
[Out] -1/d/b*c*x-1/2/d^2/b*c^2+x*ln(1+b*F^(d*x+c)/a)/b/d/ln(F)+1/d^2/ln
(F)/b*ln(1+b*F^(d*x+c)/a)*c+polylog(2,-b*F^(d*x+c)/a)/b/d^2/ln(F)
^2+1/d^2/ln(F)/b*c*ln(F^(d*x+c))-1/d^2/ln(F)/b*c*ln(a+b*F^(d*x+c)
)
```

Maxima [A] time = 0.797333, size = 107, normalized size = 1.98

$$\frac{x^2}{2\,b}-\frac{\log\left(F^{dx}\right)^2}{2\,bd^2\log(F)^2}+\frac{\log\left(\frac{F^{dx}F^cb}{a}+1\right)\log\left(F^{dx}\right)+\text{Li}_2\left(-\frac{F^{dx}F^cb}{a}\right)}{bd^2\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(F^(d*x + c)*x/(F^(d*x + c)*b + a),x, algorithm="maxima")
```

```
[Out] 1/2*x^2/b - 1/2*log(F^(d*x))^2/(b*d^2*log(F)^2) + (log(F^(d*x)*F^
c*b/a + 1)*log(F^(d*x)) + dilog(-F^(d*x)*F^c*b/a))/(b*d^2*log(F)^
```

```
2)
```

Fricas [A] time = 0.27164, size = 101, normalized size = 1.87

$$-\frac{c\log\left(F^{dx+c}b+a\right)\log\left(F\right)-\left(dx+c\right)\log\left(F\right)\log\left(\frac{F^{dx+c}b+a}{a}\right)-\mathrm{Li}_2\left(-\frac{F^{dx+c}b+a}{a}+1\right)}{bd^2\log\left(F\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(F^(d*x + c)*x/(F^(d*x + c)*b + a),x, algorithm="fricas")
```

```
[Out] -(c*log(F^(d*x + c)*b + a)*log(F) - (d*x + c)*log(F)*log((F^(d*x
+ c)*b + a)/a) - dilog(-(F^(d*x + c)*b + a)/a + 1))/(b*d^2*log(F)
^2)
```

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

$$\int \frac{F^{c+dx}x}{F^cF^{dx}b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(F**(d*x+c)*x/(a+b*F**(d*x+c)),x)
```

```
[Out] Integral(F**(c + d*x)*x/(F**c*F**(d*x)*b + a), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{F^{dx+c}x}{F^{dx+c}b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(F^(d*x + c)*x/(F^(d*x + c)*b + a),x, algorithm="giac")
```

```
[Out] integrate(F^(d*x + c)*x/(F^(d*x + c)*b + a), x)
```

3.79 $\int \frac{F^{c+dx}}{a+bF^{c+dx}}\,dx$

Optimal. Leaf size=23

$$\frac{\log\left(a+bF^{c+dx}\right)}{bd\log(F)}$$

```
[Out] Log[a + b*F^(c + d*x)]/(b*d*Log[F])
```

Rubi [A] time = 0.0576683, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095

$$\frac{\log\left(a+bF^{c+dx}\right)}{bd\log(F)}$$

Antiderivative was successfully verified.

```
[In]  Int[F^(c + d*x)/(a + b*F^(c + d*x)),x]

[Out] Log[a + b*F^(c + d*x)]/(b*d*Log[F])
```

Rubi in Sympy [A] time = 13.4553, size = 17, normalized size = 0.74

$$\frac{\log\left(F^{c+dx}b+a\right)}{bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(F**(d*x+c)/(a+b*F**(d*x+c)),x)

[Out] log(F**(c + d*x)*b + a)/(b*d*log(F))
```

Mathematica [A] time = 0.00519428, size = 23, normalized size = 1.

$$\frac{\log\left(a+bF^{c+dx}\right)}{bd\log(F)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[F^(c + d*x)/(a + b*F^(c + d*x)),x]
```

```
[Out] Log[a + b*F^(c + d*x)]/(b*d*Log[F])
```

Maple [A] time = 0.003, size = 24, normalized size = 1.

$$\frac{\ln\left(a + bF^{dx+c}\right)}{bd\ln\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(F^(d*x+c)/(a+b*F^(d*x+c)),x)
```

```
[Out] ln(a+b*F^(d*x+c))/b/d/ln(F)
```

Maxima [A] time = 0.789124, size = 31, normalized size = 1.35

$$\frac{\log\left(F^{dx+c}b + a\right)}{bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(F^(d*x + c)/(F^(d*x + c)*b + a),x, algorithm="maxima")
```

```
[Out] log(F^(d*x + c)*b + a)/(b*d*log(F))
```

Fricas [A] time = 0.250574, size = 31, normalized size = 1.35

$$\frac{\log\left(F^{dx+c}b + a\right)}{bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(F^(d*x + c)/(F^(d*x + c)*b + a),x, algorithm="fricas")
```

```
[Out] log(F^(d*x + c)*b + a)/(b*d*log(F))
```

Sympy [A] time = 0.285326, size = 17, normalized size = 0.74

$$\frac{\log\left(F^{c+dx}+\frac{a}{b}\right)}{bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(F**(d*x+c)/(a+b*F**(d*x+c)),x)

[Out] log(F**(c + d*x) + a/b)/(b*d*log(F))
```

GIAC/XCAS [A] time = 0.251633, size = 32, normalized size = 1.39

$$\frac{\ln\left(\left|F^{dx+c}b+a\right|\right)}{bd\ln\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(F^(d*x + c)/(F^(d*x + c)*b + a),x, algorithm="giac")

[Out] ln(abs(F^(d*x + c)*b + a))/(b*d*ln(F))
```

3.80 $\int \frac{F^{c+dx}}{(a+bF^{c+dx})x} dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{F^{c+dx}}{x\left(a+bF^{c+dx}\right)},x\right)$$

```
[Out] Unintegrable[F^(c + d*x)/((a + b*F^(c + d*x))*x), x]
```

Rubi [A] time = 0.102549, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.

$$\text{Int}\left(\frac{F^{c+dx}}{\left(a+bF^{c+dx}\right)x},x\right)$$

Verification is Not applicable to the result.

```
[In] Int[F^(c + d*x)/((a + b*F^(c + d*x))*x),x]

[Out] Defer[Int][F^(c + d*x)/((a + b*F^(c + d*x))*x), x]
```

Rubi in Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{F^{c+dx}}{x\left(F^{c+dx}b+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(F**(d*x+c)/(a+b*F**(d*x+c))/x,x)

[Out] Integral(F**(c + d*x)/(x*(F**(c + d*x)*b + a)), x)
```

Mathematica [A] time = 0.0534852, size = 0, normalized size = 0.

$$\int \frac{F^{c+dx}}{\left(a+bF^{c+dx}\right)x}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[F^(c + d*x)/((a + b*F^(c + d*x))*x),x]

[Out] Integrate[F^(c + d*x)/((a + b*F^(c + d*x))*x), x]
```

Maple [A] time = 0.037, size = 0, normalized size = 0.

$$\int \frac{F^{dx+c}}{\left(a + bF^{dx+c}\right) x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(F^(d*x+c)/(a+b*F^(d*x+c))/x,x)

[Out] int(F^(d*x+c)/(a+b*F^(d*x+c))/x,x)
```

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

$$-a \int \frac{1}{F^{dx} F^{c} b^{2} x + abx}\, dx + \frac{\log(x)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(F^(d*x + c)/((F^(d*x + c)*b + a)*x),x, algorithm="maxima")

[Out] -a*integrate(1/(F^(d*x)*F^c*b^2*x + a*b*x), x) + log(x)/b
```

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

$$\text{integral}\left(\frac{F^{dx+c}}{F^{dx+c} bx + ax}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(F^(d*x + c)/((F^(d*x + c)*b + a)*x),x, algorithm="fricas")

[Out] integral(F^(d*x + c)/(F^(d*x + c)*b*x + a*x), x)
```

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

$$\int \frac{F^{c+dx}}{x\left(F^{c}F^{dx}b+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(F**(d*x+c)/(a+b*F**(d*x+c))/x,x)
```

```
[Out] Integral(F**(c + d*x)/(x*(F**c*F**(d*x)*b + a)), x)
```

GIAC/XCAS [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{F^{dx+c}}{\left(F^{dx+c}b+a\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(F^(d*x + c)/((F^(d*x + c)*b + a)*x),x, algorithm="giac")
```

```
[Out] integrate(F^(d*x + c)/((F^(d*x + c)*b + a)*x), x)
```

3.81 $\int \frac{F^{c+dx}}{\left(a+bF^{c+dx}\right)x^2}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{F^{c+dx}}{x^2\left(a+bF^{c+dx}\right)},x\right)$$

```
[Out] Unintegrable[F^(c + d*x)/((a + b*F^(c + d*x))*x^2), x]
```

Rubi [A] time = 0.0999374, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$

$$\text{Int}\left(\frac{F^{c+dx}}{\left(a+bF^{c+dx}\right)x^2},x\right)$$

Verification is Not applicable to the result.

```
[In]  Int[F^(c + d*x)/((a + b*F^(c + d*x))*x^2),x]

[Out] Defer[Int][F^(c + d*x)/((a + b*F^(c + d*x))*x^2), x]
```

Rubi in Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{F^{c+dx}}{x^2\left(F^{c+dx}b+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(F**(d*x+c)/(a+b*F**(d*x+c))/x**2,x)

[Out] Integral(F**(c + d*x)/(x**2*(F**(c + d*x)*b + a)), x)
```

Mathematica [A] time = 0.0553324, size = 0, normalized size = 0.

$$\int \frac{F^{c+dx}}{\left(a+bF^{c+dx}\right)x^2}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[F^(c + d*x)/((a + b*F^(c + d*x))*x^2),x]
```

```
[Out] Integrate[F^(c + d*x)/((a + b*F^(c + d*x))*x^2), x]
```

Maple [A] time = 0.036, size = 0, normalized size = 0.

$$\int \frac{F^{dx+c}}{\left(a+bF^{dx+c}\right)x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(F^(d*x+c)/(a+b*F^(d*x+c))/x^2,x)
```

```
[Out] int(F^(d*x+c)/(a+b*F^(d*x+c))/x^2,x)
```

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

$$-a\int \frac{1}{F^{dx}F^{c}b^{2}x^{2}+abx^{2}}\,dx-\frac{1}{bx}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*integrate(1/(F^(d*x)*F^c*b^2*x^2 + a*b*x^2), x) - 1/(b*x)
```

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

$$\text{integral}\left(\frac{F^{dx+c}}{F^{dx+c}bx^{2}+ax^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral(F^(d*x + c)/(F^(d*x + c)*b*x^2 + a*x^2), x)
```

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

$$\int \frac{F^{c+dx}}{x^2 \left(F^c F^{dx} b + a\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(F**(d*x+c)/(a+b*F**(d*x+c))/x**2,x)
```

```
[Out] Integral(F**(c + d*x)/(x**2*(F**c*F**(d*x)*b + a)), x)
```

GIAC/XCAS [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{F^{dx+c}}{\left(F^{dx+c} b + a\right) x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(F^(d*x + c)/((F^(d*x + c)*b + a)*x^2), x)
```

3.82 $\int \frac{F^{c+dx}x^3}{\left(a+bF^{c+dx}\right)^2}\,dx$

Optimal. Leaf size=140

$$\frac{6\text{PolyLog}\left(3,-\frac{bF^{c+dx}}{a}\right)}{abd^4\log^4(F)}-\frac{6x\text{PolyLog}\left(2,-\frac{bF^{c+dx}}{a}\right)}{abd^3\log^3(F)}-\frac{3x^2\log\left(\frac{bF^{c+dx}}{a}+1\right)}{abd^2\log^2(F)}-\frac{x^3}{bd\log(F)\left(a+bF^{c+dx}\right)}+\frac{x^3}{abd\log(F)}$$

```
[Out] x^3/(a*b*d*Log[F]) - x^3/(b*d*(a + b*F^(c + d*x))*Log[F]) - (3*x^
2*Log[1 + (b*F^(c + d*x))/a])/(a*b*d^2*Log[F]^2) - (6*x*PolyLog[2
, -((b*F^(c + d*x))/a)])/(a*b*d^3*Log[F]^3) + (6*PolyLog[3, -((b*
F^(c + d*x))/a)])/(a*b*d^4*Log[F]^4)
```

Rubi [A] time = 0.396219, antiderivative size = 140, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25

$$\frac{6\text{PolyLog}\left(3,-\frac{bF^{c+dx}}{a}\right)}{abd^4\log^4(F)}-\frac{6x\text{PolyLog}\left(2,-\frac{bF^{c+dx}}{a}\right)}{abd^3\log^3(F)}-\frac{3x^2\log\left(\frac{bF^{c+dx}}{a}+1\right)}{abd^2\log^2(F)}-\frac{x^3}{bd\log(F)\left(a+bF^{c+dx}\right)}+\frac{x^3}{abd\log(F)}$$

Antiderivative was successfully verified.

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

```
[Out] x^3/(a*b*d*Log[F]) - x^3/(b*d*(a + b*F^(c + d*x))*Log[F]) - (3*x^
2*Log[1 + (b*F^(c + d*x))/a])/(a*b*d^2*Log[F]^2) - (6*x*PolyLog[2
, -((b*F^(c + d*x))/a)])/(a*b*d^3*Log[F]^3) + (6*PolyLog[3, -((b*
F^(c + d*x))/a)])/(a*b*d^4*Log[F]^4)
```

Rubi in Sympy [A] time = 39.0274, size = 110, normalized size = 0.79

$$-\frac{x^3}{bd\left(F^{c+dx}b+a\right)\log(F)}-\frac{3x^2\log\left(\frac{F^{-c-dx}a}{b}+1\right)}{abd^2\log(F)^2}+\frac{6x\,\text{Li}_2\left(-\frac{F^{-c-dx}a}{b}\right)}{abd^3\log(F)^3}+\frac{6\,\text{Li}_3\left(-\frac{F^{-c-dx}a}{b}\right)}{abd^4\log(F)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(F**(d*x+c)*x**3/(a+b*F**(d*x+c))**2,x)
```

```
[Out] -x**3/(b*d*(F**(c + d*x)*b + a)*log(F)) - 3*x**2*log(F**(-c - d*x
)*a/b + 1)/(a*b*d**2*log(F)**2) + 6*x*polylog(2, -F**(-c - d*x)*a
/b)/(a*b*d**3*log(F)**3) + 6*polylog(3, -F**(-c - d*x)*a/b)/(a*b*
d**4*log(F)**4)
```

Mathematica [A]   time = 0.168359, size = 137, normalized size = 0.98

$$\frac{3\left(\frac{2\text{PolyLog}\left(3,-\frac{bF^{c+dx}}{a}\right)}{ad^3\log^3(F)}-\frac{2x\text{PolyLog}\left(2,-\frac{bF^{c+dx}}{a}\right)}{ad^2\log^2(F)}-\frac{x^2\log\left(\frac{bF^{c+dx}}{a}+1\right)}{ad\log(F)}+\frac{x^3}{3a}\right)}{bd\log(F)}-\frac{x^3}{bd\log(F)\left(a+bF^{c+dx}\right)}$$

Antiderivative was successfully verified.

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

```
[Out] -(x^3/(b*d*(a + b*F^(c + d*x))*Log[F])) + (3*(x^3/(3*a) - (x^2*Lo
g[1 + (b*F^(c + d*x))/a])/(a*d*Log[F]) - (2*x*PolyLog[2, -((b*F^(
c + d*x))/a)])/(a*d^2*Log[F]^2) + (2*PolyLog[3, -((b*F^(c + d*x))
/a)])/(a*d^3*Log[F]^3))))/(b*d*Log[F])
```

Maple [A]   time = 0.032, size = 267, normalized size = 1.9

$$-\frac{x^3}{bd\left(a+bF^{dx+c}\right)\ln(F)}+\frac{x^3}{\ln(F)\,abd}-3\,\frac{c^2x}{\ln(F)\,d^3ba}-2\,\frac{c^3}{\ln(F)\,d^4ba}-3\,\frac{x^2}{abd^2\left(\ln(F)\right)^2}\ln\left(1+\frac{bF^{dx+c}}{a}\right)+3\,\frac{c^2}{\left(\ln(F)\right)^2d^4ba}\ln\left(1+\frac{bF^{dx+c}}{a}\right)-6\,\frac{x}{abd^3\left(\ln(F)\right)^3}polylog\left(2,-\frac{bF^{dx+c}}{a}\right)+6\,\frac{1}{abd^4\left(\ln(F)\right)^4}polylog\left(3,-\frac{bF^{dx+c}}{a}\right)+3\,\frac{c^2\ln\left(F^{dx+c}\right)}{\left(\ln(F)\right)^2d^4ba}-3\,\frac{c^2\ln\left(a+bF^{dx+c}\right)}{\left(\ln(F)\right)^2d^4ba}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -x^3/b/d/(a+b*F^(d*x+c))/ln(F)+x^3/a/b/d/ln(F)-3/ln(F)/d^3/b/a*c^
2*x-2/ln(F)/d^4/b/a*c^3-3*x^2*ln(1+b*F^(d*x+c)/a)/a/b/d^2/ln(F)^2
+3/ln(F)^2/d^4/b/a*ln(1+b*F^(d*x+c)/a)*c^2-6*x*polylog(2,-b*F^(d*
x+c)/a)/a/b/d^3/ln(F)^3+6*polylog(3,-b*F^(d*x+c)/a)/a/b/d^4/ln(F)
```

```
^4+3/ln(F)^2/d^4/b*c^2/a*ln(F^(d*x+c))-3/ln(F)^2/d^4/b*c^2/a*ln(a
+b*F^(d*x+c))
```

Maxima [A] time = 0.811206, size = 181, normalized size = 1.29

$$-\frac{x^3}{F^{dx}F^c b^2 d\log(F) + abd\log(F)} + \frac{\log\left(F^{dx}\right)^3}{abd^4\log(F)^4} - \frac{3\left(\log\left(\frac{F^{dx}F^c b}{a}+1\right)\log\left(F^{dx}\right)^2 + 2\,\mathrm{Li}_2\left(-\frac{F^{dx}F^c b}{a}\right)\log\left(F^{dx}\right) - 2\,\mathrm{Li}_3\left(-\frac{F^{dx}F^c b}{a}\right)\right)}{abd^4\log(F)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -x^3/(F^(d*x)*F^c*b^2*d*log(F) + a*b*d*log(F)) + log(F^(d*x))^3/(
a*b*d^4*log(F)^4) - 3*(log(F^(d*x)*F^c*b/a + 1)*log(F^(d*x))^2 +
2*dilog(-F^(d*x)*F^c*b/a)*log(F^(d*x)) - 2*polylog(3, -F^(d*x)*F^
c*b/a))/(a*b*d^4*log(F)^4)
```

Fricas [A] time = 0.240121, size = 332, normalized size = 2.37

$$\frac{ac^3\log(F)^3 + \left(bd^3x^3 + bc^3\right)F^{dx+c}\log(F)^3 - 6\left(F^{dx+c}bdx\log(F) + adx\log(F)\right)\mathrm{Li}_2\left(-\frac{F^{dx+c}b+a}{a}+1\right) - 3\left(F^{dx+c}bc^2\log(F)^2 \cdots\right.}{F^{dx+c}ab^2d^4 \cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (a*c^3*log(F)^3 + (b*d^3*x^3 + b*c^3)*F^(d*x + c)*log(F)^3 - 6*(F
^(d*x + c)*b*d*x*log(F) + a*d*x*log(F))*dilog(-(F^(d*x + c)*b + a
)/a + 1) - 3*(F^(d*x + c)*b*c^2*log(F)^2 + a*c^2*log(F)^2)*log(F^
(d*x + c)*b + a) - 3*((b*d^2*x^2 - b*c^2)*F^(d*x + c)*log(F)^2 +
(a*d^2*x^2 - a*c^2)*log(F)^2)*log((F^(d*x + c)*b + a)/a) + 6*(F^(
d*x + c)*b + a)*polylog(3, -F^(d*x + c)*b/a))/(F^(d*x + c)*a*b^2*
d^4*log(F)^4 + a^2*b*d^4*log(F)^4)
```

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

$$-\frac{x^3}{F^{c+dx}b^2d\log(F) + abd\log(F)} + \frac{3\int\frac{x^2}{a+be^{c\log(F)}e^{dx\log(F)}}\,dx}{bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -x**3/(F**(c + d*x)*b**2*d*log(F) + a*b*d*log(F)) + 3*Integral(x*
*2/(a + b*exp(c*log(F))*exp(d*x*log(F))), x)/(b*d*log(F))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{F^{dx+c}x^3}{\left(F^{dx+c}b+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.83 $\int \frac{F^{c+dx}x^2}{\left(a+bF^{c+dx}\right)^2}\,dx$

Optimal. Leaf size=107

$$-\frac{2\text{PolyLog}\left(2,-\frac{bF^{c+dx}}{a}\right)}{abd^3\log^3(F)}-\frac{2x\log\left(\frac{bF^{c+dx}}{a}+1\right)}{abd^2\log^2(F)}-\frac{x^2}{bd\log(F)\left(a+bF^{c+dx}\right)}+\frac{x^2}{abd\log(F)}$$

```
[Out] x^2/(a*b*d*Log[F]) - x^2/(b*d*(a + b*F^(c + d*x))*Log[F]) - (2*x*
Log[1 + (b*F^(c + d*x))/a])/(a*b*d^2*Log[F]^2) - (2*PolyLog[2, -(
(b*F^(c + d*x))/a)])/(a*b*d^3*Log[F]^3)
```

Rubi [A] time = 0.286074, antiderivative size = 107, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208

$$-\frac{2\text{PolyLog}\left(2,-\frac{bF^{c+dx}}{a}\right)}{abd^3\log^3(F)}-\frac{2x\log\left(\frac{bF^{c+dx}}{a}+1\right)}{abd^2\log^2(F)}-\frac{x^2}{bd\log(F)\left(a+bF^{c+dx}\right)}+\frac{x^2}{abd\log(F)}$$

Antiderivative was successfully verified.

```
[In]  Int[(F^(c + d*x)*x^2)/(a + b*F^(c + d*x))^2,x]
```

```
[Out] x^2/(a*b*d*Log[F]) - x^2/(b*d*(a + b*F^(c + d*x))*Log[F]) - (2*x*
Log[1 + (b*F^(c + d*x))/a])/(a*b*d^2*Log[F]^2) - (2*PolyLog[2, -(
(b*F^(c + d*x))/a)])/(a*b*d^3*Log[F]^3)
```

Rubi in Sympy [A] time = 29.0544, size = 78, normalized size = 0.73

$$-\frac{x^2}{bd\left(F^{c+dx}b+a\right)\log(F)}-\frac{2x\log\left(\frac{F^{-c-dx}a}{b}+1\right)}{abd^2\log(F)^2}+\frac{2\operatorname{Li}_2\left(-\frac{F^{-c-dx}a}{b}\right)}{abd^3\log(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(F**(d*x+c)*x**2/(a+b*F**(d*x+c))**2,x)
```

```
[Out] -x**2/(b*d*(F**(c + d*x)*b + a)*log(F)) - 2*x*log(F**(-c - d*x)*a
/b + 1)/(a*b*d**2*log(F)**2) + 2*polylog(2, -F**(-c - d*x)*a/b)/(
a*b*d**3*log(F)**3)
```

Mathematica [A] time = 0.114668, size = 103, normalized size = 0.96

$$\frac{dx\log(F)\left(bdx\log(F)F^{c+dx}-2\left(a+bF^{c+dx}\right)\log\left(\frac{bF^{c+dx}}{a}+1\right)\right)-2\left(a+bF^{c+dx}\right)\text{PolyLog}\left(2,-\frac{bF^{c+dx}}{a}\right)}{abd^3\log^3(F)\left(a+bF^{c+dx}\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(F^(c + d*x)*x^2)/(a + b*F^(c + d*x))^2,x]
```

```
[Out] (d*x*Log[F]*(b*d*F^(c + d*x)*x*Log[F] - 2*(a + b*F^(c + d*x))*Log
[1 + (b*F^(c + d*x))/a]) - 2*(a + b*F^(c + d*x))*PolyLog[2, -((b*
F^(c + d*x))/a)])/(a*b*d^3*(a + b*F^(c + d*x))*Log[F]^3)
```

Maple [B] time = 0.028, size = 225, normalized size = 2.1

$$-\frac{x^2}{bd\left(a+bF^{dx+c}\right)\ln(F)}+\frac{x^2}{\ln(F)abd}+2\frac{cx}{\ln(F)d^2ba}+\frac{c^2}{\ln(F)d^3ba}-2\frac{x}{abd^2(\ln(F))^2}\ln\left(1+\frac{bF^{dx+c}}{a}\right)-2\frac{c}{(\ln(F))^2d^3ba}\ln\left(1+\frac{bF^{dx+c}}{a}\right)-2\frac{1}{abd^3(\ln(F))^3}\mathit{polylog}\left(2,-\frac{bF^{dx+c}}{a}\right)-2\frac{c\ln\left(F^{dx+c}\right)}{(\ln(F))^2d^3ba}+2\frac{c\ln\left(a+bF^{dx+c}\right)}{(\ln(F))^2d^3ba}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(F^(d*x+c)*x^2/(a+b*F^(d*x+c))^2,x)
```

```
[Out] -x^2/b/d/(a+b*F^(d*x+c))/ln(F)+x^2/a/b/d/ln(F)+2/ln(F)/d^2/b/a*c*
x+1/ln(F)/d^3/b/a*c^2-2*x*ln(1+b*F^(d*x+c)/a)/a/b/d^2/ln(F)^2-2/l
n(F)^2/d^3/b/a*ln(1+b*F^(d*x+c)/a)*c-2*polylog(2,-b*F^(d*x+c)/a)/
a/b/d^3/ln(F)^3-2/ln(F)^2/d^3/b*c/a*ln(F^(d*x+c))+2/ln(F)^2/d^3/b
*c/a*ln(a+b*F^(d*x+c))
```

Maxima [A] time = 0.802561, size = 143, normalized size = 1.34

$$-\frac{x^2}{F^{dx}F^cb^2d\log(F)+abd\log(F)}+\frac{\log\left(F^{dx}\right)^2}{abd^3\log(F)^3}-\frac{2\left(\log\left(\frac{F^{dx}F^cb}{a}+1\right)\log\left(F^{dx}\right)+\mathrm{Li}_2\left(-\frac{F^{dx}F^cb}{a}\right)\right)}{abd^3\log(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -x^2/(F^(d*x)*F^c*b^2*d*log(F) + a*b*d*log(F)) + log(F^(d*x))^2/(
a*b*d^3*log(F)^3) - 2*(log(F^(d*x)*F^c*b/a + 1)*log(F^(d*x)) + di
log(-F^(d*x)*F^c*b/a))/(a*b*d^3*log(F)^3)
```

Fricas [A] time = 0.254642, size = 251, normalized size = 2.35

$$-\frac{ac^2 \log(F)^2 - \left(bd^2x^2 - bc^2\right)F^{dx+c}\log(F)^2 + 2\left(F^{dx+c}b + a\right)\mathrm{Li}_2\left(-\frac{F^{dx+c}b+a}{a} + 1\right) - 2\left(F^{dx+c}bc\log(F) + ac\log(F)\right)\log\left(F^{d}\right.}{F^{dx+c}ab^2d^3\log(F)^3 + a^2bd^3\log(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -(a*c^2*log(F)^2 - (b*d^2*x^2 - b*c^2)*F^(d*x + c)*log(F)^2 + 2*(
F^(d*x + c)*b + a)*dilog(-(F^(d*x + c)*b + a)/a + 1) - 2*(F^(d*x
+ c)*b*c*log(F) + a*c*log(F))*log(F^(d*x + c)*b + a) + 2*((b*d*x
+ b*c)*F^(d*x + c)*log(F) + (a*d*x + a*c)*log(F))*log((F^(d*x + c
)*b + a)/a))/(F^(d*x + c)*a*b^2*d^3*log(F)^3 + a^2*b*d^3*log(F)^3
)
```

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

$$-\frac{x^2}{F^{c+dx}b^2d\log(F) + abd\log(F)} + \frac{2\int \frac{x}{a+be^{c\log(F)}e^{dx\log(F)}}\,dx}{bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(F**(d*x+c)*x**2/(a+b*F**(d*x+c))**2,x)
```

```
[Out] -x**2/(F**(c + d*x)*b**2*d*log(F) + a*b*d*log(F)) + 2*Integral(x/
(a + b*exp(c*log(F))*exp(d*x*log(F))), x)/(b*d*log(F))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{F^{dx+c}x^2}{\left(F^{dx+c}b + a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(F^(d*x + c)*x^2/(F^(d*x + c)*b + a)^2, x)
```

3.84 $\int \frac{F^{c+dx}x}{(a+bF^{c+dx})^2}\,dx$

Optimal. Leaf size=69

$$-\frac{\log\left(a+bF^{c+dx}\right)}{abd^2\log^2(F)}-\frac{x}{bd\log(F)\left(a+bF^{c+dx}\right)}+\frac{x}{abd\log(F)}$$

```
[Out] x/(a*b*d*Log[F]) - x/(b*d*(a + b*F^(c + d*x))*Log[F]) - Log[a + b
*F^(c + d*x)]/(a*b*d^2*Log[F]^2)
```

Rubi [A] time = 0.127374, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227

$$-\frac{\log\left(a+bF^{c+dx}\right)}{abd^2\log^2(F)}-\frac{x}{bd\log(F)\left(a+bF^{c+dx}\right)}+\frac{x}{abd\log(F)}$$

Antiderivative was successfully verified.

```
[In]  Int[(F^(c + d*x)*x)/(a + b*F^(c + d*x))^2,x]
```

```
[Out] x/(a*b*d*Log[F]) - x/(b*d*(a + b*F^(c + d*x))*Log[F]) - Log[a + b
*F^(c + d*x)]/(a*b*d^2*Log[F]^2)
```

Rubi in Sympy [A] time = 22.4891, size = 92, normalized size = 1.33

$$\frac{F^{-c-dx}F^{c+dx}\log\left(F^{c+dx}\right)}{abd^2\log(F)^2}-\frac{F^{-c-dx}F^{c+dx}\log\left(F^{c+dx}b+a\right)}{abd^2\log(F)^2}-\frac{x}{bd\left(F^{c+dx}b+a\right)\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(F**(d*x+c)*x/(a+b*F**(d*x+c))**2,x)
```

```
[Out] F**(-c - d*x)*F**(c + d*x)*log(F**(c + d*x))/(a*b*d**2*log(F)**2)
 - F**(-c - d*x)*F**(c + d*x)*log(F**(c + d*x)*b + a)/(a*b*d**2*l
og(F)**2) - x/(b*d*(F**(c + d*x)*b + a)*log(F))
```

Mathematica [A] time = 0.0787814, size = 54, normalized size = 0.78

$$\frac{\frac{dx\log(F)F^{c+dx}}{a+bF^{c+dx}}-\frac{\log\left(a+bF^{c+dx}\right)}{b}}{ad^2\log^2(F)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(F^(c + d*x)*x)/(a + b*F^(c + d*x))^2,x]
```

```
[Out] ((d*F^(c + d*x)*x*Log[F])/(a + b*F^(c + d*x)) - Log[a + b*F^(c +
d*x)]/b)/(a*d^2*Log[F]^2)
```

Maple [A] time = 0.019, size = 67, normalized size = 1.

$$\frac{x\mathrm{e}^{(dx+c)\ln(F)}}{\ln(F)\,ad\left(a+b\mathrm{e}^{(dx+c)\ln(F)}\right)}-\frac{\ln\left(a+b\mathrm{e}^{(dx+c)\ln(F)}\right)}{(\ln(F))^2\,abd^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(F^(d*x+c)*x/(a+b*F^(d*x+c))^2,x)
```

```
[Out] 1/ln(F)/a/d*x*exp((d*x+c)*ln(F))/(a+b*exp((d*x+c)*ln(F)))-1/ln(F)
^2/b/d^2/a*ln(a+b*exp((d*x+c)*ln(F)))
```

Maxima [A] time = 0.851064, size = 97, normalized size = 1.41

$$\frac{F^{dx}F^cx}{F^{dx}F^cabd\log(F)+a^2d\log(F)}-\frac{\log\left(\frac{F^{dx}F^cb+a}{F^cb}\right)}{abd^2\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] F^(d*x)*F^c*x/(F^(d*x)*F^c*a*b*d*log(F) + a^2*d*log(F)) - log((F^
(d*x)*F^c*b + a)/(F^c*b))/(a*b*d^2*log(F)^2)
```

Fricas [A] time = 0.246253, size = 100, normalized size = 1.45

$$\frac{F^{dx+c}bdx\log(F) - \left(F^{dx+c}b + a\right)\log\left(F^{dx+c}b + a\right)}{F^{dx+c}ab^2d^2\log(F)^2 + a^2bd^2\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (F^(d*x + c)*b*d*x*log(F) - (F^(d*x + c)*b + a)*log(F^(d*x + c)*b
 + a))/(F^(d*x + c)*a*b^2*d^2*log(F)^2 + a^2*b*d^2*log(F)^2)
```

Sympy [A] time = 0.402991, size = 58, normalized size = 0.84

$$-\frac{x}{F^{c+dx}b^2d\log(F) + abd\log(F)} + \frac{x}{abd\log(F)} - \frac{\log\left(F^{c+dx} + \frac{a}{b}\right)}{abd^2\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(F**(d*x+c)*x/(a+b*F**(d*x+c))**2,x)
```

```
[Out] -x/(F**(c + d*x)*b**2*d*log(F) + a*b*d*log(F)) + x/(a*b*d*log(F))
 - log(F**(c + d*x) + a/b)/(a*b*d**2*log(F)**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{F^{dx+c}x}{\left(F^{dx+c}b + a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(F^(d*x + c)*x/(F^(d*x + c)*b + a)^2, x)
```

3.85 $\int \frac{F^{c+dx}}{\left(a+bF^{c+dx}\right)^2}\,dx$

Optimal. Leaf size=25

$$-\frac{1}{bd\log(F)\left(a+bF^{c+dx}\right)}$$

```
[Out] -(1/(b*d*(a + b*F^(c + d*x))*Log[F]))
```

Rubi [A] time = 0.0571669, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095

$$-\frac{1}{bd\log(F)\left(a+bF^{c+dx}\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[F^(c + d*x)/(a + b*F^(c + d*x))^2,x]

[Out] -(1/(b*d*(a + b*F^(c + d*x))*Log[F]))
```

Rubi in Sympy [A] time = 7.62534, size = 19, normalized size = 0.76

$$-\frac{1}{bd\left(F^{c+dx}b+a\right)\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(F**(d*x+c)/(a+b*F**(d*x+c))**2,x)

[Out] -1/(b*d*(F**(c + d*x)*b + a)*log(F))
```

Mathematica [A] time = 0.0199145, size = 25, normalized size = 1.

$$-\frac{1}{bd\log(F)\left(a+bF^{c+dx}\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[F^(c + d*x)/(a + b*F^(c + d*x))^2,x]

[Out] -(1/(b*d*(a + b*F^(c + d*x))*Log[F]))
```

Maple [A] time = 0.003, size = 26, normalized size = 1.

$$-\frac{1}{bd\left(a+bF^{dx+c}\right)\ln\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(F^(d*x+c)/(a+b*F^(d*x+c))^2,x)

[Out] -1/b/d/(a+b*F^(d*x+c))/ln(F)
```

Maxima [A] time = 0.776674, size = 34, normalized size = 1.36

$$-\frac{1}{\left(F^{dx+c}b+a\right)bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] -1/((F^(d*x + c)*b + a)*b*d*log(F))
```

Fricas [A] time = 0.256049, size = 34, normalized size = 1.36

$$-\frac{1}{F^{dx+c}b^{2}d\log\left(F\right)+abd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] -1/(F^(d*x + c)*b^2*d*log(F) + a*b*d*log(F))
```

Sympy [A] time = 0.267698, size = 26, normalized size = 1.04

$$-\frac{1}{F^{c+dx}b^{2}d\log\left(F\right)+abd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(F**(d*x+c)/(a+b*F**(d*x+c))**2,x)
```

```
[Out] -1/(F**(c + d*x)*b**2*d*log(F) + a*b*d*log(F))
```

GIAC/XCAS [A] time = 0.227116, size = 34, normalized size = 1.36

$$-\frac{1}{\left(F^{dx+c}b+a\right)bd\ln\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/((F^(d*x + c)*b + a)*b*d*ln(F))
```

3.86 $\int \frac{F^{c+dx}}{\left(a+bF^{c+dx}\right)^2 x} \, dx$

Optimal. Leaf size=61

$$-\frac{\text{Int}\left(\frac{1}{x^2\left(a+bF^{c+dx}\right)},x\right)}{bd\log(F)}-\frac{1}{bdx\log(F)\left(a+bF^{c+dx}\right)}$$

```
[Out] -(1/(b*d*(a + b*F^(c + d*x))*x*Log[F])) - Unintegrable[1/((a + b*
F^(c + d*x))*x^2), x]/(b*d*Log[F])
```

Rubi [A] time = 0.182814, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$

$$\text{Int}\left(\frac{F^{c+dx}}{\left(a+bF^{c+dx}\right)^2 x},x\right)$$

Verification is Not applicable to the result.

```
[In]  Int[F^(c + d*x)/((a + b*F^(c + d*x))^2*x),x]
```

```
[Out] -(1/(b*d*(a + b*F^(c + d*x))*x*Log[F])) - Defer[Int][1/((a + b*F^
(c + d*x))*x^2), x]/(b*d*Log[F])
```

Rubi in Sympy [A] time = 0., size = 0, normalized size = 0.

$$-\frac{\int \frac{1}{x^2\left(F^{c+dx}b+a\right)}\, dx}{bd\log(F)}-\frac{1}{bdx\left(F^{c+dx}b+a\right)\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(F**(d*x+c)/(a+b*F**(d*x+c))**2/x,x)
```

```
[Out] -Integral(1/(x**2*(F**(c + d*x)*b + a)), x)/(b*d*log(F)) - 1/(b*d
*x*(F**(c + d*x)*b + a)*log(F))
```

Mathematica [A] time = 0.143998, size = 0, normalized size = 0.

$$\int \frac{F^{c+dx}}{\left(a+bF^{c+dx}\right)^2 x}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[F^(c + d*x)/((a + b*F^(c + d*x))^2*x),x]
```

```
[Out] Integrate[F^(c + d*x)/((a + b*F^(c + d*x))^2*x), x]
```

Maple [A] time = 0.036, size = 0, normalized size = 0.

$$\int \frac{F^{dx+c}}{\left(a+bF^{dx+c}\right)^2 x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(F^(d*x+c)/(a+b*F^(d*x+c))^2/x,x)
```

```
[Out] int(F^(d*x+c)/(a+b*F^(d*x+c))^2/x,x)
```

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

$$-\frac{1}{F^{dx}F^{c}b^{2}dx\log(F)+abdx\log(F)}-\int \frac{1}{F^{dx}F^{c}b^{2}dx^{2}\log(F)+abdx^{2}\log(F)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/(F^(d*x)*F^c*b^2*d*x*log(F) + a*b*d*x*log(F)) - integrate(1/(F
^(d*x)*F^c*b^2*d*x^2*log(F) + a*b*d*x^2*log(F)), x)
```

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

$$\operatorname{integral}\left(\frac{F^{dx+c}}{2\,F^{dx+c}abx+F^{2\,dx+2\,c}b^{2}x+a^{2}x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral(F^(d*x + c)/(2*F^(d*x + c)*a*b*x + F^(2*d*x + 2*c)*b^2*x
 + a^2*x), x)
```

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

$$-\frac{1}{F^{c+dx}b^2dx\log(F)+abdx\log(F)}-\frac{\int\frac{1}{ax^2+bx^2e^{c\log(F)}e^{dx\log(F)}}\,dx}{bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(F**(d*x+c)/(a+b*F**(d*x+c))**2/x,x)
```

```
[Out] -1/(F**(c + d*x)*b**2*d*x*log(F) + a*b*d*x*log(F)) - Integral(1/(
a*x**2 + b*x**2*exp(c*log(F))*exp(d*x*log(F))), x)/(b*d*log(F))
```

GIAC/XCAS [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{F^{dx+c}}{\left(F^{dx+c}b+a\right)^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(F^(d*x + c)/((F^(d*x + c)*b + a)^2*x), x)
```

3.87 $\int \frac{F^{c+dx}}{\left(a+bF^{c+dx}\right)^2 x^2} \, dx$

Optimal. Leaf size=61

$$-\frac{2\text{Int}\left(\frac{1}{x^3\left(a+bF^{c+dx}\right)},x\right)}{bd\log(F)}-\frac{1}{bdx^2\log(F)\left(a+bF^{c+dx}\right)}$$

```
[Out] -(1/(b*d*(a + b*F^(c + d*x))*x^2*Log[F])) - (2*Unintegrable[1/((a
 + b*F^(c + d*x))*x^3), x])/(b*d*Log[F])
```

Rubi [A] time = 0.181372, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$

$$\text{Int}\left(\frac{F^{c+dx}}{\left(a+bF^{c+dx}\right)^2 x^2},x\right)$$

Verification is Not applicable to the result.

```
[In]  Int[F^(c + d*x)/((a + b*F^(c + d*x))^2*x^2),x]
```

```
[Out] -(1/(b*d*(a + b*F^(c + d*x))*x^2*Log[F])) - (2*Defer[Int][1/((a +
 b*F^(c + d*x))*x^3), x])/(b*d*Log[F])
```

Rubi in Sympy [A] time = 0., size = 0, normalized size = 0.

$$-\frac{2\int \frac{1}{x^3\left(F^{c+dx}b+a\right)}\,dx}{bd\log(F)}-\frac{1}{bdx^2\left(F^{c+dx}b+a\right)\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(F**(d*x+c)/(a+b*F**(d*x+c))**2/x**2,x)
```

```
[Out] -2*Integral(1/(x**3*(F**(c + d*x)*b + a)), x)/(b*d*log(F)) - 1/(b
*d*x**2*(F**(c + d*x)*b + a)*log(F))
```

Mathematica [A] time = 0.153336, size = 0, normalized size = 0.

$$\int \frac{F^{c+dx}}{\left(a+bF^{c+dx}\right)^2 x^2}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[F^(c + d*x)/((a + b*F^(c + d*x))^2*x^2),x]
```

```
[Out] Integrate[F^(c + d*x)/((a + b*F^(c + d*x))^2*x^2), x]
```

Maple [A] time = 0.048, size = 0, normalized size = 0.

$$\int \frac{F^{dx+c}}{\left(a+bF^{dx+c}\right)^2 x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(F^(d*x+c)/(a+b*F^(d*x+c))^2/x^2,x)
```

```
[Out] int(F^(d*x+c)/(a+b*F^(d*x+c))^2/x^2,x)
```

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

$$-\frac{1}{F^{dx}F^{c}b^2dx^2\log(F)+abdx^2\log(F)}-2\int \frac{1}{F^{dx}F^{c}b^2dx^3\log(F)+abdx^3\log(F)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/(F^(d*x)*F^c*b^2*d*x^2*log(F) + a*b*d*x^2*log(F)) - 2*integrat
e(1/(F^(d*x)*F^c*b^2*d*x^3*log(F) + a*b*d*x^3*log(F)), x)
```

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

$$\text{integral}\left(\frac{F^{dx+c}}{2\,F^{dx+c}abx^2+F^{2\,dx+2\,c}b^2x^2+a^2x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral(F^(d*x + c)/(2*F^(d*x + c)*a*b*x^2 + F^(2*d*x + 2*c)*b^2
*x^2 + a^2*x^2), x)
```

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

$$-\frac{1}{F^{c+dx}b^2dx^2\log(F)+abdx^2\log(F)}-\frac{2\int\frac{1}{ax^3+bx^3e^{c\log(F)}e^{dx\log(F)}}\,dx}{bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(F**(d*x+c)/(a+b*F**(d*x+c))**2/x**2,x)
```

```
[Out] -1/(F**(c + d*x)*b**2*d*x**2*log(F) + a*b*d*x**2*log(F)) - 2*Inte
gral(1/(a*x**3 + b*x**3*exp(c*log(F))*exp(d*x*log(F))), x)/(b*d*l
og(F))
```

GIAC/XCAS [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{F^{dx+c}}{\left(F^{dx+c}b+a\right)^2x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(F^(d*x + c)/((F^(d*x + c)*b + a)^2*x^2), x)
```

3.88 $\int \frac{F^{c+dx}x^3}{\left(a+bF^{c+dx}\right)^3}\,dx$

Optimal. Leaf size=261

$$\frac{3\text{PolyLog}\left(2,-\frac{bF^{c+dx}}{a}\right)}{a^2bd^4\log^4(F)}+\frac{3\text{PolyLog}\left(3,-\frac{bF^{c+dx}}{a}\right)}{a^2bd^4\log^4(F)}-\frac{3x\text{PolyLog}\left(2,-\frac{bF^{c+dx}}{a}\right)}{a^2bd^3\log^3(F)}+\frac{3x\log\left(\frac{bF^{c+dx}}{a}+1\right)}{a^2bd^3\log^3(F)}-\frac{3x^2\log\left(\frac{bF^{c+dx}}{a}+1\right)}{2a^2bd^2\log^2(F)}-\frac{3x^2}{2a^2bd^2\log^2(F)}+\frac{x^3}{2a^2bd\log(F)}+\frac{3x^2}{2abd^2\log^2(F)\left(a+bF^{c+dx}\right)}-\frac{x^3}{2bd\log(F)\left(a+bF^{c+dx}\right)^2}$$

```
[Out] (-3*x^2)/(2*a^2*b*d^2*Log[F]^2) + (3*x^2)/(2*a*b*d^2*(a + b*F^(c
+ d*x))*Log[F]^2) + x^3/(2*a^2*b*d*Log[F]) - x^3/(2*b*d*(a + b*F^
(c + d*x))^2*Log[F]) + (3*x*Log[1 + (b*F^(c + d*x))/a])/(a^2*b*d^
3*Log[F]^3) - (3*x^2*Log[1 + (b*F^(c + d*x))/a])/(2*a^2*b*d^2*Log
[F]^2) + (3*PolyLog[2, -((b*F^(c + d*x))/a)])/(a^2*b*d^4*Log[F]^4
) - (3*x*PolyLog[2, -((b*F^(c + d*x))/a)])/(a^2*b*d^3*Log[F]^3) +
 (3*PolyLog[3, -((b*F^(c + d*x))/a)])/(a^2*b*d^4*Log[F]^4)
```

Rubi [A] time = 0.804055, antiderivative size = 261, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 9, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375

$$\frac{3\text{PolyLog}\left(2,-\frac{bF^{c+dx}}{a}\right)}{a^2bd^4\log^4(F)}+\frac{3\text{PolyLog}\left(3,-\frac{bF^{c+dx}}{a}\right)}{a^2bd^4\log^4(F)}-\frac{3x\text{PolyLog}\left(2,-\frac{bF^{c+dx}}{a}\right)}{a^2bd^3\log^3(F)}+\frac{3x\log\left(\frac{bF^{c+dx}}{a}+1\right)}{a^2bd^3\log^3(F)}-\frac{3x^2\log\left(\frac{bF^{c+dx}}{a}+1\right)}{2a^2bd^2\log^2(F)}-\frac{3x^2}{2a^2bd^2\log^2(F)}+\frac{x^3}{2a^2bd\log(F)}+\frac{3x^2}{2abd^2\log^2(F)\left(a+bF^{c+dx}\right)}-\frac{x^3}{2bd\log(F)\left(a+bF^{c+dx}\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(F^(c + d*x)*x^3)/(a + b*F^(c + d*x))^3,x]
```

```
[Out] (-3*x^2)/(2*a^2*b*d^2*Log[F]^2) + (3*x^2)/(2*a*b*d^2*(a + b*F^(c
+ d*x))*Log[F]^2) + x^3/(2*a^2*b*d*Log[F]) - x^3/(2*b*d*(a + b*F^
(c + d*x))^2*Log[F]) + (3*x*Log[1 + (b*F^(c + d*x))/a])/(a^2*b*d^
3*Log[F]^3) - (3*x^2*Log[1 + (b*F^(c + d*x))/a])/(2*a^2*b*d^2*Log
[F]^2) + (3*PolyLog[2, -((b*F^(c + d*x))/a)])/(a^2*b*d^4*Log[F]^4
) - (3*x*PolyLog[2, -((b*F^(c + d*x))/a)])/(a^2*b*d^3*Log[F]^3) +
 (3*PolyLog[3, -((b*F^(c + d*x))/a)])/(a^2*b*d^4*Log[F]^4)
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(F**(d*x+c)*x**3/(a+b*F**(d*x+c))**3,x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.457701, size = 220, normalized size = 0.84

$$\frac{6\left(a+bF^{c+dx}\right)^2 \text{PolyLog}\left(3,-\frac{bF^{c+dx}}{a}\right)-6(dx\log(F)-1)\left(a+bF^{c+dx}\right)^2 \text{PolyLog}\left(2,-\frac{bF^{c+dx}}{a}\right)+dx\log(F)\left(bd^2x^2\log^2(F)F\right.}{2a^2bd^4\log^4(F}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(F^(c + d*x)*x^3)/(a + b*F^(c + d*x))^3,x]
```

```
[Out] (d*x*Log[F]*(b*d^2*F^(c + d*x)*(2*a + b*F^(c + d*x))*x^2*Log[F]^2
 + 6*(a + b*F^(c + d*x))^2*Log[1 + (b*F^(c + d*x))/a] - 3*d*(a +
b*F^(c + d*x))*x*Log[F]*(b*F^(c + d*x) + (a + b*F^(c + d*x))*Log[
1 + (b*F^(c + d*x))/a])) - 6*(a + b*F^(c + d*x))^2*(-1 + d*x*Log[
F])*PolyLog[2, -((b*F^(c + d*x))/a)] + 6*(a + b*F^(c + d*x))^2*Po
lyLog[3, -((b*F^(c + d*x))/a)])/(2*a^2*b*d^4*(a + b*F^(c + d*x))^
2*Log[F]^4)
```

Maple [A] time = 0.053, size = 488, normalized size = 1.9

$$-\frac{\left(\ln(F)\,adx-3\,bF^{dx+c}-3\,a\right)x^2}{2\,(\ln(F))^2\,d^2ab\left(a+bF^{dx+c}\right)^2}+\frac{x^3}{2\,a^2bd\ln(F)}-\frac{3\,c^2x}{2\,a^2bd^3\ln(F)}-\frac{c^3}{a^2bd^4\ln(F)}$$
$$-\frac{3\,x^2}{2\,a^2bd^2\,(\ln(F))^2}\ln\left(1+\frac{bF^{dx+c}}{a}\right)+\frac{3\,c^2}{2\,a^2bd^4\,(\ln(F))^2}\ln\left(1+\frac{bF^{dx+c}}{a}\right)$$
$$-3\,\frac{x}{a^2bd^3\,(\ln(F))^3}polylog\left(2,-\frac{bF^{dx+c}}{a}\right)+3\,\frac{1}{a^2bd^4\,(\ln(F))^4}polylog\left(3,-\frac{bF^{dx+c}}{a}\right)$$
$$+\frac{3\,c^2\ln\left(F^{dx+c}\right)}{2\,a^2bd^4\,(\ln(F))^2}-\frac{3\,c^2\ln\left(a+bF^{dx+c}\right)}{2\,a^2bd^4\,(\ln(F))^2}-\frac{3\,x^2}{2\,a^2bd^2\,(\ln(F))^2}-3\,\frac{cx}{a^2bd^3\,(\ln(F))^2}$$
$$-\frac{3\,c^2}{2\,a^2bd^4\,(\ln(F))^2}+3\,\frac{x}{a^2bd^3\,(\ln(F))^3}\ln\left(1+\frac{bF^{dx+c}}{a}\right)+3\,\frac{c}{a^2bd^4\,(\ln(F))^3}\ln\left(1+\frac{bF^{dx+c}}{a}\right)$$
$$+3\,\frac{1}{a^2bd^4\,(\ln(F))^4}polylog\left(2,-\frac{bF^{dx+c}}{a}\right)+3\,\frac{c\ln\left(F^{dx+c}\right)}{a^2bd^4\,(\ln(F))^3}-3\,\frac{c\ln\left(a+bF^{dx+c}\right)}{a^2bd^4\,(\ln(F))^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(F^(d*x+c)*x^3/(a+b*F^(d*x+c))^3,x)
```

```
[Out] -1/2*x^2*(ln(F)*a*d*x-3*b*F^(d*x+c)-3*a)/ln(F)^2/d^2/a/b/(a+b*F^(
d*x+c))^2+1/2*x^3/a^2/b/d/ln(F)-3/2/b/a^2/d^3/ln(F)*c^2*x-1/b/a^2
/d^4/ln(F)*c^3-3/2*x^2*ln(1+b*F^(d*x+c)/a)/a^2/b/d^2/ln(F)^2+3/2/
b/a^2/d^4/ln(F)^2*ln(1+b*F^(d*x+c)/a)*c^2-3*x*polylog(2,-b*F^(d*x
+c)/a)/a^2/b/d^3/ln(F)^3+3*polylog(3,-b*F^(d*x+c)/a)/a^2/b/d^4/ln
(F)^4+3/2/b/a^2/d^4/ln(F)^2*c^2*ln(F^(d*x+c))-3/2/b/a^2/d^4/ln(F)
^2*c^2*ln(a+b*F^(d*x+c))-3/2*x^2/a^2/b/d^2/ln(F)^2-3/b/a^2/d^3/ln
(F)^2*c*x-3/2/b/a^2/d^4/ln(F)^2*c^2+3*x*ln(1+b*F^(d*x+c)/a)/a^2/b
/d^3/ln(F)^3+3/b/a^2/d^4/ln(F)^3*ln(1+b*F^(d*x+c)/a)*c+3*polylog(
2,-b*F^(d*x+c)/a)/a^2/b/d^4/ln(F)^4+3/b/a^2/d^4/ln(F)^3*c*ln(F^(d
*x+c))-3/b/a^2/d^4/ln(F)^3*c*ln(a+b*F^(d*x+c))
```

Maxima [A] time = 0.812794, size = 355, normalized size = 1.36

$$-\frac{adx^3\log(F)-3\,F^{dx}F^cbx^2-3\,ax^2}{2\left(2\,F^{dx}F^ca^2b^2d^2\log(F)^2+F^{2\,dx}F^{2\,c}ab^3d^2\log(F)^2+a^3bd^2\log(F)^2\right)}$$
$$-\frac{3\left(\log\left(\frac{F^{dx}F^cb}{a}+1\right)\log\left(F^{dx}\right)^2+2\,\mathrm{Li}_2\left(-\frac{F^{dx}F^cb}{a}\right)\log\left(F^{dx}\right)-2\,\mathrm{Li}_3(-\frac{F^{dx}F^cb}{a})\right)}{2\,a^2bd^4\log(F)^4}$$
$$+\frac{\log\left(F^{dx}\right)^3-3\,\log\left(F^{dx}\right)^2}{2\,a^2bd^4\log(F)^4}+\frac{3\left(\log\left(\frac{F^{dx}F^cb}{a}+1\right)\log\left(F^{dx}\right)+\mathrm{Li}_2\left(-\frac{F^{dx}F^cb}{a}\right)\right)}{a^2bd^4\log(F)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*(a*d*x^3*log(F) - 3*F^(d*x)*F^c*b*x^2 - 3*a*x^2)/(2*F^(d*x)*
F^c*a^2*b^2*d^2*log(F)^2 + F^(2*d*x)*F^(2*c)*a*b^3*d^2*log(F)^2 +
 a^3*b*d^2*log(F)^2) - 3/2*(log(F^(d*x)*F^c*b/a + 1)*log(F^(d*x))
^2 + 2*dilog(-F^(d*x)*F^c*b/a)*log(F^(d*x)) - 2*polylog(3, -F^(d*
x)*F^c*b/a))/(a^2*b*d^4*log(F)^4) + 1/2*(log(F^(d*x))^3 - 3*log(F
^(d*x))^2)/(a^2*b*d^4*log(F)^4) + 3*(log(F^(d*x)*F^c*b/a + 1)*log
(F^(d*x)) + dilog(-F^(d*x)*F^c*b/a))/(a^2*b*d^4*log(F)^4)
```

Fricas [A] time = 0.27339, size = 779, normalized size = 2.98

$$\frac{a^2c^3\log(F)^3 + 3\,a^2c^2\log(F)^2 + \left(\left(b^2d^3x^3 + b^2c^3\right)\log(F)^3 - 3\left(b^2d^2x^2 - b^2c^2\right)\log(F)^2\right)F^{2\,dx+2\,c} + \left(2\left(abd^3x^3 + abc^3\right)\log(F\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*(a^2*c^3*log(F)^3 + 3*a^2*c^2*log(F)^2 + ((b^2*d^3*x^3 + b^2*
c^3)*log(F)^3 - 3*(b^2*d^2*x^2 - b^2*c^2)*log(F)^2)*F^(2*d*x + 2*
c) + (2*(a*b*d^3*x^3 + a*b*c^3)*log(F)^3 - 3*(a*b*d^2*x^2 - 2*a*b
*c^2)*log(F)^2)*F^(d*x + c) - 6*(a^2*d*x*log(F) + (b^2*d*x*log(F)
 - b^2)*F^(2*d*x + 2*c) + 2*(a*b*d*x*log(F) - a*b)*F^(d*x + c) -
a^2)*dilog(-(F^(d*x + c)*b + a)/a + 1) - 3*(a^2*c^2*log(F)^2 + 2*
a^2*c*log(F) + (b^2*c^2*log(F)^2 + 2*b^2*c*log(F))*F^(2*d*x + 2*c
) + 2*(a*b*c^2*log(F)^2 + 2*a*b*c*log(F))*F^(d*x + c))*log(F^(d*x
 + c)*b + a) - 3*((a^2*d^2*x^2 - a^2*c^2)*log(F)^2 + ((b^2*d^2*x^
2 - b^2*c^2)*log(F)^2 - 2*(b^2*d*x + b^2*c)*log(F))*F^(2*d*x + 2*
c) + 2*((a*b*d^2*x^2 - a*b*c^2)*log(F)^2 - 2*(a*b*d*x + a*b*c)*lo
g(F))*F^(d*x + c) - 2*(a^2*d*x + a^2*c)*log(F))*log((F^(d*x + c)*
b + a)/a) + 6*(2*F^(d*x + c)*a*b + F^(2*d*x + 2*c)*b^2 + a^2)*pol
ylog(3, -F^(d*x + c)*b/a))/(2*F^(d*x + c)*a^3*b^2*d^4*log(F)^4 +
F^(2*d*x + 2*c)*a^2*b^3*d^4*log(F)^4 + a^4*b*d^4*log(F)^4)
```

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

$$\frac{3F^{c+dx}bx^2 - adx^3\log(F) + 3ax^2}{4F^{c+dx}a^2b^2d^2\log(F)^2 + 2F^{2c+2dx}ab^3d^2\log(F)^2 + 2a^3bd^2\log(F)^2} + \frac{3\left(\int\left(-\frac{2x}{a+be^{c\log(F)}e^{dx\log(F)}}\right)dx + \int\frac{dx^2\log(F)}{a+be^{c\log(F)}e^{dx\log(F)}}dx\right)}{2abd^2\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(F**(d*x+c)*x**3/(a+b*F**(d*x+c))**3,x)
```

```
[Out] (3*F**(c + d*x)*b*x**2 - a*d*x**3*log(F) + 3*a*x**2)/(4*F**(c + d
*x)*a**2*b**2*d**2*log(F)**2 + 2*F**(2*c + 2*d*x)*a*b**3*d**2*log
(F)**2 + 2*a**3*b*d**2*log(F)**2) + 3*(Integral(-2*x/(a + b*exp(c
*log(F))*exp(d*x*log(F))), x) + Integral(d*x**2*log(F)/(a + b*exp
(c*log(F))*exp(d*x*log(F))), x))/(2*a*b*d**2*log(F)**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{F^{dx+c}x^3}{\left(F^{dx+c}b+a\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(F^(d*x + c)*x^3/(F^(d*x + c)*b + a)^3, x)
```

3.89 $\int \frac{F^{c+dx}x^2}{(a+bF^{c+dx})^3}\,dx$

Optimal. Leaf size=182

$$-\frac{\text{PolyLog}\left(2,-\frac{bF^{c+dx}}{a}\right)}{a^2bd^3\log^3(F)}+\frac{\log\left(a+bF^{c+dx}\right)}{a^2bd^3\log^3(F)}-\frac{x\log\left(\frac{bF^{c+dx}}{a}+1\right)}{a^2bd^2\log^2(F)}-\frac{x}{a^2bd^2\log^2(F)}+\frac{x^2}{2a^2bd\log(F)}+\frac{x}{abd^2\log^2(F)\left(a+bF^{c+dx}\right)}-\frac{x^2}{2bd\log(F)\left(a+bF^{c+dx}\right)^2}$$

```
[Out] -(x/(a^2*b*d^2*Log[F]^2)) + x/(a*b*d^2*(a + b*F^(c + d*x))*Log[F]
^2) + x^2/(2*a^2*b*d*Log[F]) - x^2/(2*b*d*(a + b*F^(c + d*x))^2*L
og[F]) + Log[a + b*F^(c + d*x)]/(a^2*b*d^3*Log[F]^3) - (x*Log[1 +
 (b*F^(c + d*x))/a])/(a^2*b*d^2*Log[F]^2) - PolyLog[2, -((b*F^(c
+ d*x))/a)]/(a^2*b*d^3*Log[F]^3)
```

Rubi [A] time = 0.485859, antiderivative size = 182, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 10, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417

$$-\frac{\text{PolyLog}\left(2,-\frac{bF^{c+dx}}{a}\right)}{a^2bd^3\log^3(F)}+\frac{\log\left(a+bF^{c+dx}\right)}{a^2bd^3\log^3(F)}-\frac{x\log\left(\frac{bF^{c+dx}}{a}+1\right)}{a^2bd^2\log^2(F)}-\frac{x}{a^2bd^2\log^2(F)}+\frac{x^2}{2a^2bd\log(F)}+\frac{x}{abd^2\log^2(F)\left(a+bF^{c+dx}\right)}-\frac{x^2}{2bd\log(F)\left(a+bF^{c+dx}\right)^2}$$

Antiderivative was successfully verified.

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


```
[Out] -(x/(a^2*b*d^2*Log[F]^2)) + x/(a*b*d^2*(a + b*F^(c + d*x))*Log[F]
^2) + x^2/(2*a^2*b*d*Log[F]) - x^2/(2*b*d*(a + b*F^(c + d*x))^2*L
og[F]) + Log[a + b*F^(c + d*x)]/(a^2*b*d^3*Log[F]^3) - (x*Log[1 +
 (b*F^(c + d*x))/a])/(a^2*b*d^2*Log[F]^2) - PolyLog[2, -((b*F^(c
+ d*x))/a)]/(a^2*b*d^3*Log[F]^3)
```

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

$$\frac{F^{-c-dx}F^{c+dx}x}{abd^2\left(F^{c+dx}b+a\right)\log\left(F\right)^2}+\frac{F^{-c-dx}F^{c+dx}x\log\left(F^{c+dx}\right)}{a^2bd^2\log\left(F\right)^2}-\frac{F^{-c-dx}F^{c+dx}x\log\left(F^{c+dx}b+a\right)}{a^2bd^2\log\left(F\right)^2}-\frac{x^2}{2bd\left(F^{c+dx}b+a\right)^2\log\left(F\right)}+\frac{\int x\,dx}{a^2bd\log\left(F\right)}-\frac{x\log\left(F^{c+dx}\right)}{a^2bd^2\log\left(F\right)^2}+\frac{x\log\left(F^{c+dx}b+a\right)}{a^2bd^2\log\left(F\right)^2}-\frac{x\log\left(\frac{F^{c+dx}b}{a}+1\right)}{a^2bd^2\log\left(F\right)^2}-\frac{\log\left(F^{c+dx}\right)}{a^2bd^3\log\left(F\right)^3}+\frac{\log\left(F^{c+dx}b+a\right)}{a^2bd^3\log\left(F\right)^3}-\frac{\mathrm{Li}_2\left(-\frac{F^{c+dx}b}{a}\right)}{a^2bd^3\log\left(F\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(F**(d*x+c)*x**2/(a+b*F**(d*x+c))**3,x)
```

```
[Out] F**(-c - d*x)*F**(c + d*x)*x/(a*b*d**2*(F**(c + d*x)*b + a)*log(F
)**2) + F**(-c - d*x)*F**(c + d*x)*x*log(F**(c + d*x))/(a**2*b*d*
*2*log(F)**2) - F**(-c - d*x)*F**(c + d*x)*x*log(F**(c + d*x)*b +
 a)/(a**2*b*d**2*log(F)**2) - x**2/(2*b*d*(F**(c + d*x)*b + a)**2
*log(F)) + Integral(x, x)/(a**2*b*d*log(F)) - x*log(F**(c + d*x))
/(a**2*b*d**2*log(F)**2) + x*log(F**(c + d*x)*b + a)/(a**2*b*d**2
*log(F)**2) - x*log(F**(c + d*x)*b/a + 1)/(a**2*b*d**2*log(F)**2)
 - log(F**(c + d*x))/(a**2*b*d**3*log(F)**3) + log(F**(c + d*x)*b
 + a)/(a**2*b*d**3*log(F)**3) - polylog(2, -F**(c + d*x)*b/a)/(a*
*2*b*d**3*log(F)**3)
```

Mathematica [A] time = 0.215485, size = 177, normalized size = 0.97

$$\frac{-2\left(a+bF^{c+dx}\right)^2\text{PolyLog}\left(2,-\frac{bF^{c+dx}}{a}\right)+bd^2x^2\log^2(F)F^{c+dx}\left(2a+bF^{c+dx}\right)+2\left(a+bF^{c+dx}\right)^2\log\left(\frac{bF^{c+dx}}{a}+1\right)-2dx\log(}{2a^2bd^3\log^3(F)\left(a+bF^{c+dx}\right)^2}$$

Antiderivative was successfully verified.

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

```
[Out] (b*d^2*F^(c + d*x)*(2*a + b*F^(c + d*x))*x^2*Log[F]^2 + 2*(a + b*
F^(c + d*x))^2*Log[1 + (b*F^(c + d*x))/a] - 2*d*(a + b*F^(c + d*x
))*x*Log[F]*(b*F^(c + d*x) + (a + b*F^(c + d*x))*Log[1 + (b*F^(c
+ d*x))/a]) - 2*(a + b*F^(c + d*x))^2*PolyLog[2, -((b*F^(c + d*x)
)/a)])/(2*a^2*b*d^3*(a + b*F^(c + d*x))^2*Log[F]^3)
```

Maple [A] time = 0.04, size = 295, normalized size = 1.6

$$-\frac{\left(\ln\left(F\right)adx-2\,bF^{dx+c}-2\,a\right)x}{2\,\left(\ln\left(F\right)\right)^{2}d^{2}ab\left(a+bF^{dx+c}\right)^{2}}+\frac{x^{2}}{2\,a^{2}bd\ln\left(F\right)}+\frac{cx}{a^{2}bd^{2}\ln\left(F\right)}+\frac{c^{2}}{2\,a^{2}bd^{3}\ln\left(F\right)}-\frac{x}{a^{2}bd^{2}\left(\ln\left(F\right)\right)^{2}}\ln\left(1+\frac{bF^{dx+c}}{a}\right)-\frac{c}{a^{2}bd^{3}\left(\ln\left(F\right)\right)^{2}}\ln\left(1+\frac{bF^{dx+c}}{a}\right)-\frac{1}{a^{2}bd^{3}\left(\ln\left(F\right)\right)^{3}}polylog\left(2,-\frac{bF^{dx+c}}{a}\right)-\frac{\ln\left(F^{dx+c}\right)}{a^{2}bd^{3}\left(\ln\left(F\right)\right)^{3}}+\frac{\ln\left(a+bF^{dx+c}\right)}{a^{2}bd^{3}\left(\ln\left(F\right)\right)^{3}}-\frac{c\ln\left(F^{dx+c}\right)}{a^{2}bd^{3}\left(\ln\left(F\right)\right)^{2}}+\frac{c\ln\left(a+bF^{dx+c}\right)}{a^{2}bd^{3}\left(\ln\left(F\right)\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*x*(ln(F)*a*d*x-2*b*F^(d*x+c)-2*a)/ln(F)^2/d^2/a/b/(a+b*F^(d*
x+c))^2+1/2*x^2/a^2/b/d/ln(F)+1/b/a^2/d^2/ln(F)*c*x+1/2/b/a^2/d^3
/ln(F)*c^2-x*ln(1+b*F^(d*x+c)/a)/a^2/b/d^2/ln(F)^2-1/b/a^2/d^3/ln
(F)^2*ln(1+b*F^(d*x+c)/a)*c-polylog(2,-b*F^(d*x+c)/a)/a^2/b/d^3/l
n(F)^3-1/b/a^2/d^3/ln(F)^3*ln(F^(d*x+c))+ln(a+b*F^(d*x+c))/a^2/b/
d^3/ln(F)^3-1/b/a^2/d^3/ln(F)^2*c*ln(F^(d*x+c))+1/b/a^2/d^3/ln(F)
^2*c*ln(a+b*F^(d*x+c))
```

Maxima [A] time = 0.799338, size = 289, normalized size = 1.59

$$-\frac{adx^{2}\log\left(F\right)-2\,F^{dx}F^{c}bx-2\,ax}{2\,\left(2\,F^{dx}F^{c}a^{2}b^{2}d^{2}\log\left(F\right)^{2}+F^{2\,dx}F^{2\,c}ab^{3}d^{2}\log\left(F\right)^{2}+a^{3}bd^{2}\log\left(F\right)^{2}\right)}+\frac{\log\left(F^{dx}\right)^{2}}{2\,a^{2}bd^{3}\log\left(F\right)^{3}}-\frac{\log\left(\frac{F^{dx}F^{c}b}{a}+1\right)\log\left(F^{dx}\right)+\mathrm{Li}_{2}\left(-\frac{F^{dx}F^{c}b}{a}\right)}{a^{2}bd^{3}\log\left(F\right)^{3}}+\frac{\log\left(F^{dx}F^{c}b+a\right)}{a^{2}bd^{3}\log\left(F\right)^{3}}-\frac{\log\left(F^{dx}\right)}{a^{2}bd^{3}\log\left(F\right)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*(a*d*x^2*log(F) - 2*F^(d*x)*F^c*b*x - 2*a*x)/(2*F^(d*x)*F^c*
a^2*b^2*d^2*log(F)^2 + F^(2*d*x)*F^(2*c)*a*b^3*d^2*log(F)^2 + a^3
*b*d^2*log(F)^2) + 1/2*log(F^(d*x))^2/(a^2*b*d^3*log(F)^3) - (log
(F^(d*x)*F^c*b/a + 1)*log(F^(d*x)) + dilog(-F^(d*x)*F^c*b/a))/(a^
2*b*d^3*log(F)^3) + log(F^(d*x)*F^c*b + a)/(a^2*b*d^3*log(F)^3) -
 log(F^(d*x))/(a^2*b*d^3*log(F)^3)
```

Fricas [A] time = 0.266591, size = 512, normalized size = 2.81

$$-\frac{a^2c^2\log(F)^2 + 2\,a^2c\log(F) - \left(\left(b^2d^2x^2 - b^2c^2\right)\log(F)^2 - 2\left(b^2dx + b^2c\right)\log(F)\right)F^{2\,dx+2\,c} - 2\left(\left(abd^2x^2 - abc^2\right)\log(F)^2 - \right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*(a^2*c^2*log(F)^2 + 2*a^2*c*log(F) - ((b^2*d^2*x^2 - b^2*c^2
)*log(F)^2 - 2*(b^2*d*x + b^2*c)*log(F))*F^(2*d*x + 2*c) - 2*((a*
b*d^2*x^2 - a*b*c^2)*log(F)^2 - (a*b*d*x + 2*a*b*c)*log(F))*F^(d*
x + c) + 2*(2*F^(d*x + c)*a*b + F^(2*d*x + 2*c)*b^2 + a^2)*dilog(
-(F^(d*x + c)*b + a)/a + 1) - 2*(a^2*c*log(F) + (b^2*c*log(F) + b
^2)*F^(2*d*x + 2*c) + 2*(a*b*c*log(F) + a*b)*F^(d*x + c) + a^2)*l
og(F^(d*x + c)*b + a) + 2*((b^2*d*x + b^2*c)*F^(2*d*x + 2*c)*log(
F) + 2*(a*b*d*x + a*b*c)*F^(d*x + c)*log(F) + (a^2*d*x + a^2*c)*l
og(F))*log((F^(d*x + c)*b + a)/a))/(2*F^(d*x + c)*a^3*b^2*d^3*log
(F)^3 + F^(2*d*x + 2*c)*a^2*b^3*d^3*log(F)^3 + a^4*b*d^3*log(F)^3
)
```

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

$$\frac{2F^{c+dx}bx - adx^2\log(F) + 2ax}{4F^{c+dx}a^2b^2d^2\log(F)^2 + 2F^{2c+2dx}ab^3d^2\log(F)^2 + 2a^3bd^2\log(F)^2} + \frac{\int \frac{dx\log(F)}{a+be^{c\log(F)}e^{dx\log(F)}}\,dx + \int\left(-\frac{1}{a+be^{c\log(F)}e^{dx\log(F)}}\right)dx}{abd^2\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (2*F**(c + d*x)*b*x - a*d*x**2*log(F) + 2*a*x)/(4*F**(c + d*x)*a*
*2*b**2*d**2*log(F)**2 + 2*F**(2*c + 2*d*x)*a*b**3*d**2*log(F)**2
 + 2*a**3*b*d**2*log(F)**2) + (Integral(d*x*log(F)/(a + b*exp(c*l
og(F))*exp(d*x*log(F))), x) + Integral(-1/(a + b*exp(c*log(F))*ex
p(d*x*log(F))), x))/(a*b*d**2*log(F)**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{F^{dx+c}x^2}{\left(F^{dx+c}b + a\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.90 $\int \frac{F^{c+dx}x}{\left(a+bF^{c+dx}\right)^3}\,dx$

Optimal. Leaf size=106

$$-\frac{\log\left(a+bF^{c+dx}\right)}{2a^2bd^2\log^2(F)}+\frac{x}{2a^2bd\log(F)}+\frac{1}{2abd^2\log^2(F)\left(a+bF^{c+dx}\right)}-\frac{x}{2bd\log(F)\left(a+bF^{c+dx}\right)^2}$$

```
[Out] 1/(2*a*b*d^2*(a + b*F^(c + d*x))*Log[F]^2) + x/(2*a^2*b*d*Log[F])
 - x/(2*b*d*(a + b*F^(c + d*x))^2*Log[F]) - Log[a + b*F^(c + d*x)
]/(2*a^2*b*d^2*Log[F]^2)
```

Rubi [A] time = 0.162312, antiderivative size = 106, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136

$$-\frac{\log\left(a+bF^{c+dx}\right)}{2a^2bd^2\log^2(F)}+\frac{x}{2a^2bd\log(F)}+\frac{1}{2abd^2\log^2(F)\left(a+bF^{c+dx}\right)}-\frac{x}{2bd\log(F)\left(a+bF^{c+dx}\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(F^(c + d*x)*x)/(a + b*F^(c + d*x))^3,x]
```

```
[Out] 1/(2*a*b*d^2*(a + b*F^(c + d*x))*Log[F]^2) + x/(2*a^2*b*d*Log[F])
 - x/(2*b*d*(a + b*F^(c + d*x))^2*Log[F]) - Log[a + b*F^(c + d*x)
]/(2*a^2*b*d^2*Log[F]^2)
```

Rubi in Sympy [A] time = 30.5095, size = 141, normalized size = 1.33

$$\frac{F^{-c-dx}F^{c+dx}}{2abd^2\left(F^{c+dx}b+a\right)\log\left(F\right)^2}+\frac{F^{-c-dx}F^{c+dx}\log\left(F^{c+dx}\right)}{2a^2bd^2\log\left(F\right)^2}-\frac{F^{-c-dx}F^{c+dx}\log\left(F^{c+dx}b+a\right)}{2a^2bd^2\log\left(F\right)^2}-\frac{x}{2bd\left(F^{c+dx}b+a\right)^2\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(F**(d*x+c)*x/(a+b*F**(d*x+c))**3,x)
```

```
[Out] F**(-c - d*x)*F**(c + d*x)/(2*a*b*d**2*(F**(c + d*x)*b + a)*log(F
)**2) + F**(-c - d*x)*F**(c + d*x)*log(F**(c + d*x))/(2*a**2*b*d*
*2*log(F)**2) - F**(-c - d*x)*F**(c + d*x)*log(F**(c + d*x)*b + a
```

```
)/(2*a**2*b*d**2*log(F)**2) - x/(2*b*d*(F**(c + d*x)*b + a)**2*lo
g(F))
```

Mathematica [A] time = 0.097254, size = 98, normalized size = 0.92

$$\frac{bdx\log(F)F^{c+dx}\left(2a+bF^{c+dx}\right)-\left(a+bF^{c+dx}\right)\left(\left(a+bF^{c+dx}\right)\log\left(a+bF^{c+dx}\right)-a\right)}{2a^2bd^2\log^2(F)\left(a+bF^{c+dx}\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(F^(c + d*x)*x)/(a + b*F^(c + d*x))^3,x]
```

```
[Out] (b*d*F^(c + d*x)*(2*a + b*F^(c + d*x))*x*Log[F] - (a + b*F^(c + d
*x))*(-a + (a + b*F^(c + d*x))*Log[a + b*F^(c + d*x)]))/(2*a^2*b*
d^2*(a + b*F^(c + d*x))^2*Log[F]^2)
```

Maple [A] time = 0.026, size = 127, normalized size = 1.2

$$\frac{1}{\left(a+b\mathrm{e}^{(dx+c)\ln(F)}\right)^2}\left(\frac{\mathrm{e}^{(dx+c)\ln(F)}}{2\left(\ln(F)\right)^2ad^2}+\frac{x\mathrm{e}^{(dx+c)\ln(F)}}{\ln(F)\,ad}+\frac{bx\left(\mathrm{e}^{(dx+c)\ln(F)}\right)^2}{2\ln(F)\,a^2d}+\frac{1}{2\left(\ln(F)\right)^2bd^2}\right)-\frac{\ln\left(a+b\mathrm{e}^{(dx+c)\ln(F)}\right)}{2\left(\ln(F)\right)^2a^2bd^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(F^(d*x+c)*x/(a+b*F^(d*x+c))^3,x)
```

```
[Out] (1/2/ln(F)^2/a/d^2*exp((d*x+c)*ln(F))+1/ln(F)/a/d*x*exp((d*x+c)*l
n(F))+1/2/ln(F)/a^2/d*b*x*exp((d*x+c)*ln(F))^2+1/2/ln(F)^2/b/d^2)
/(a+b*exp((d*x+c)*ln(F)))^2-1/2/ln(F)^2/b/d^2/a^2*ln(a+b*exp((d*x
+c)*ln(F)))
```

Maxima [A] time = 0.813258, size = 203, normalized size = 1.92

$$\frac{F^{2dx}F^{2c}b^2dx\log(F)+(2F^cabdx\log(F)+F^cab)F^{dx}+a^2}{2\left(2F^{dx}F^ca^3b^2d^2\log(F)^2+F^{2dx}F^{2c}a^2b^3d^2\log(F)^2+a^4bd^2\log(F)^2\right)}-\frac{\log\left(\frac{F^{dx}F^cb+a}{F^cb}\right)}{2a^2bd^2\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*(F^(2*d*x)*F^(2*c)*b^2*d*x*log(F) + (2*F^c*a*b*d*x*log(F) + F
^c*a*b)*F^(d*x) + a^2)/(2*F^(d*x)*F^c*a^3*b^2*d^2*log(F)^2 + F^(2
*d*x)*F^(2*c)*a^2*b^3*d^2*log(F)^2 + a^4*b*d^2*log(F)^2) - 1/2*lo
g((F^(d*x)*F^c*b + a)/(F^c*b))/(a^2*b*d^2*log(F)^2)
```

Fricas [A] time = 0.264746, size = 200, normalized size = 1.89

$$\frac{F^{2\,dx+2\,c}b^2dx\log\left(F\right)+\left(2\,abdx\log\left(F\right)+ab\right)F^{dx+c}+a^2-\left(2\,F^{dx+c}ab+F^{2\,dx+2\,c}b^2+a^2\right)\log\left(F^{dx+c}b+a\right)}{2\,\left(2\,F^{dx+c}a^3b^2d^2\log\left(F\right)^2+F^{2\,dx+2\,c}a^2b^3d^2\log\left(F\right)^2+a^4bd^2\log\left(F\right)^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*(F^(2*d*x + 2*c)*b^2*d*x*log(F) + (2*a*b*d*x*log(F) + a*b)*F^
(d*x + c) + a^2 - (2*F^(d*x + c)*a*b + F^(2*d*x + 2*c)*b^2 + a^2)
*log(F^(d*x + c)*b + a))/(2*F^(d*x + c)*a^3*b^2*d^2*log(F)^2 + F^
(2*d*x + 2*c)*a^2*b^3*d^2*log(F)^2 + a^4*b*d^2*log(F)^2)
```

Sympy [A] time = 0.516574, size = 122, normalized size = 1.15

$$\frac{F^{c+dx}b-adx\log\left(F\right)+a}{4F^{c+dx}a^2b^2d^2\log\left(F\right)^2+2F^{2c+2dx}ab^3d^2\log\left(F\right)^2+2a^3bd^2\log\left(F\right)^2}+\frac{x}{2a^2bd\log\left(F\right)}-\frac{\log\left(F^{c+dx}+\frac{a}{b}\right)}{2a^2bd^2\log\left(F\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(F**(d*x+c)*x/(a+b*F**(d*x+c))**3,x)
```

```
[Out] (F**(c + d*x)*b - a*d*x*log(F) + a)/(4*F**(c + d*x)*a**2*b**2*d**
2*log(F)**2 + 2*F**(2*c + 2*d*x)*a*b**3*d**2*log(F)**2 + 2*a**3*b
*d**2*log(F)**2) + x/(2*a**2*b*d*log(F)) - log(F**(c + d*x) + a/b
)/(2*a**2*b*d**2*log(F)**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{F^{dx+c}x}{\left(F^{dx+c}b+a\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(F^(d*x + c)*x/(F^(d*x + c)*b + a)^3, x)
```

3.91 $\int \frac{F^{c+dx}}{(a+bF^{c+dx})^3} \, dx$

Optimal. Leaf size=27

$$-\frac{1}{2bd\log(F)\left(a+bF^{c+dx}\right)^2}$$

```
[Out] -1/(2*b*d*(a + b*F^(c + d*x))^2*Log[F])
```

Rubi [A] time = 0.0578369, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095

$$-\frac{1}{2bd\log(F)\left(a+bF^{c+dx}\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[F^(c + d*x)/(a + b*F^(c + d*x))^3,x]
```

```
[Out] -1/(2*b*d*(a + b*F^(c + d*x))^2*Log[F])
```

Rubi in Sympy [A] time = 8.52864, size = 22, normalized size = 0.81

$$-\frac{1}{2bd\left(F^{c+dx}b+a\right)^2\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(F**(d*x+c)/(a+b*F**(d*x+c))**3,x)
```

```
[Out] -1/(2*b*d*(F**(c + d*x)*b + a)**2*log(F))
```

Mathematica [A] time = 0.0171485, size = 27, normalized size = 1.

$$-\frac{1}{2bd\log(F)\left(a+bF^{c+dx}\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[F^(c + d*x)/(a + b*F^(c + d*x))^3,x]
```

```
[Out] -1/(2*b*d*(a + b*F^(c + d*x))^2*Log[F])
```

Maple [A] time = 0.003, size = 26, normalized size = 1.

$$-\frac{1}{2\,bd\left(a+bF^{dx+c}\right)^{2}\ln\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(F^(d*x+c)/(a+b*F^(d*x+c))^3,x)
```

```
[Out] -1/2/b/d/(a+b*F^(d*x+c))^2/ln(F)
```

Maxima [A] time = 0.771134, size = 34, normalized size = 1.26

$$-\frac{1}{2\left(F^{dx+c}b+a\right)^{2}bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2/((F^(d*x + c)*b + a)^2*b*d*log(F))
```

Fricas [A] time = 0.255177, size = 62, normalized size = 2.3

$$-\frac{1}{2\left(2\,F^{dx+c}ab^{2}d\log\left(F\right)+F^{2\,dx+2\,c}b^{3}d\log\left(F\right)+a^{2}bd\log\left(F\right)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2/(2*F^(d*x + c)*a*b^2*d*log(F) + F^(2*d*x + 2*c)*b^3*d*log(F)
 + a^2*b*d*log(F))
```

Sympy [A] time = 0.299489, size = 53, normalized size = 1.96

$$-\frac{1}{4F^{c+dx}ab^2d\log(F)+2F^{2c+2dx}b^3d\log(F)+2a^2bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(F**(d*x+c)/(a+b*F**(d*x+c))**3,x)
```

```
[Out] -1/(4*F**(c + d*x)*a*b**2*d*log(F) + 2*F**(2*c + 2*d*x)*b**3*d*lo
g(F) + 2*a**2*b*d*log(F))
```

GIAC/XCAS [A] time = 0.239818, size = 34, normalized size = 1.26

$$-\frac{1}{2\left(F^{dx+c}b+a\right)^2bd\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2/((F^(d*x + c)*b + a)^2*b*d*ln(F))
```

3.92 $\int \frac{F^{c+dx}}{\left(a+bF^{c+dx}\right)^3 x}\,dx$

Optimal. Leaf size=65

$$-\frac{\operatorname{Int}\left(\frac{1}{x^2\left(a+bF^{c+dx}\right)^2},x\right)}{2bd\log(F)}-\frac{1}{2bdx\log(F)\left(a+bF^{c+dx}\right)^2}$$

```
[Out] -1/(2*b*d*(a + b*F^(c + d*x))^2*x*Log[F]) - Unintegrable[1/((a +
b*F^(c + d*x))^2*x^2), x]/(2*b*d*Log[F])
```

Rubi [A] time = 0.182751, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$

$$\operatorname{Int}\left(\frac{F^{c+dx}}{\left(a+bF^{c+dx}\right)^3 x},x\right)$$

Verification is Not applicable to the result.

```
[In]  Int[F^(c + d*x)/((a + b*F^(c + d*x))^3*x),x]
```

```
[Out] -1/(2*b*d*(a + b*F^(c + d*x))^2*x*Log[F]) - Defer[Int][1/((a + b*
F^(c + d*x))^2*x^2), x]/(2*b*d*Log[F])
```

Rubi in Sympy [A] time = 0., size = 0, normalized size = 0.

$$-\frac{\int \frac{1}{x^2\left(F^{c+dx}b+a\right)^2}\,dx}{2bd\log(F)}-\frac{1}{2bdx\left(F^{c+dx}b+a\right)^2\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(F**(d*x+c)/(a+b*F**(d*x+c))**3/x,x)
```

```
[Out] -Integral(1/(x**2*(F**(c + d*x)*b + a)**2), x)/(2*b*d*log(F)) - 1
/(2*b*d*x*(F**(c + d*x)*b + a)**2*log(F))
```

Mathematica [A] time = 0.832427, size = 0, normalized size = 0.

$$\int \frac{F^{c+dx}}{\left(a + bF^{c+dx}\right)^3 x}\, dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[F^(c + d*x)/((a + b*F^(c + d*x))^3*x),x]
```

```
[Out] Integrate[F^(c + d*x)/((a + b*F^(c + d*x))^3*x), x]
```

Maple [A] time = 0.091, size = 0, normalized size = 0.

$$\int \frac{F^{dx+c}}{\left(a + bF^{dx+c}\right)^3 x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(F^(d*x+c)/(a+b*F^(d*x+c))^3/x,x)
```

```
[Out] int(F^(d*x+c)/(a+b*F^(d*x+c))^3/x,x)
```

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

$$-\frac{adx\log(F) + F^{dx}F^{c}b + a}{2\left(2\,F^{dx}F^{c}a^{2}b^{2}d^{2}x^{2}\log(F)^{2} + F^{2\,dx}F^{2\,c}ab^{3}d^{2}x^{2}\log(F)^{2} + a^{3}bd^{2}x^{2}\log(F)^{2}\right)} - \int \frac{dx\log(F) + 2}{2\left(F^{dx}F^{c}ab^{2}d^{2}x^{3}\log(F)^{2} + a^{2}bd^{2}x^{3}\log(F)^{2}\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*(a*d*x*log(F) + F^(d*x)*F^c*b + a)/(2*F^(d*x)*F^c*a^2*b^2*d^
2*x^2*log(F)^2 + F^(2*d*x)*F^(2*c)*a*b^3*d^2*x^2*log(F)^2 + a^3*b
*d^2*x^2*log(F)^2) - integrate(1/2*(d*x*log(F) + 2)/(F^(d*x)*F^c*
a*b^2*d^2*x^3*log(F)^2 + a^2*b*d^2*x^3*log(F)^2), x)
```

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

$$\text{integral}\left(\frac{F^{dx+c}}{3\,F^{dx+c}a^2bx + 3\,F^{2\,dx+2\,c}ab^2x + F^{3\,dx+3\,c}b^3x + a^3x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral(F^(d*x + c)/(3*F^(d*x + c)*a^2*b*x + 3*F^(2*d*x + 2*c)*a
*b^2*x + F^(3*d*x + 3*c)*b^3*x + a^3*x), x)
```

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

$$\frac{-F^{c+dx}b - adx\log(F) - a}{4F^{c+dx}a^2b^2d^2x^2\log(F)^2 + 2F^{2c+2dx}ab^3d^2x^2\log(F)^2 + 2a^3bd^2x^2\log(F)^2} - \frac{\int\frac{dx\log(F)}{ax^3+bx^3e^{c\log(F)}e^{dx\log(F)}}\,dx + \int\frac{2}{ax^3+bx^3e^{c\log(F)}e^{dx\log(F)}}\,dx}{2abd^2\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(F**(d*x+c)/(a+b*F**(d*x+c))**3/x,x)
```

```
[Out] (-F**(c + d*x)*b - a*d*x*log(F) - a)/(4*F**(c + d*x)*a**2*b**2*d*
*2*x**2*log(F)**2 + 2*F**(2*c + 2*d*x)*a*b**3*d**2*x**2*log(F)**2
 + 2*a**3*b*d**2*x**2*log(F)**2) - (Integral(d*x*log(F)/(a*x**3 +
 b*x**3*exp(c*log(F))*exp(d*x*log(F))), x) + Integral(2/(a*x**3 +
 b*x**3*exp(c*log(F))*exp(d*x*log(F))), x))/(2*a*b*d**2*log(F)**2
)
```

GIAC/XCAS [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{F^{dx+c}}{\left(F^{dx+c}b + a\right)^3x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(F^(d*x + c)/((F^(d*x + c)*b + a)^3*x), x)
```

3.93 $\int \frac{F^{c+dx}}{\left(a+bF^{c+dx}\right)^3 x^2} \, dx$

Optimal. Leaf size=63

$$-\frac{\text{Int}\left(\frac{1}{x^3\left(a+bF^{c+dx}\right)^2},x\right)}{bd\log(F)}-\frac{1}{2bdx^2\log(F)\left(a+bF^{c+dx}\right)^2}$$

```
[Out] -1/(2*b*d*(a + b*F^(c + d*x))^2*x^2*Log[F]) - Unintegrable[1/((a
+ b*F^(c + d*x))^2*x^3), x]/(b*d*Log[F])
```

Rubi [A] time = 0.178992, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.

$$\text{Int}\left(\frac{F^{c+dx}}{\left(a+bF^{c+dx}\right)^3 x^2},x\right)$$

Verification is Not applicable to the result.

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

```
[Out] -1/(2*b*d*(a + b*F^(c + d*x))^2*x^2*Log[F]) - Defer[Int][1/((a +
b*F^(c + d*x))^2*x^3), x]/(b*d*Log[F])
```

Rubi in Sympy [A] time = 0., size = 0, normalized size = 0.

$$-\frac{\int \frac{1}{x^3\left(F^{c+dx}b+a\right)^2}\, dx}{bd\log\left(F\right)}-\frac{1}{2bdx^2\left(F^{c+dx}b+a\right)^2\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(F**(d*x+c)/(a+b*F**(d*x+c))**3/x**2,x)
```

```
[Out] -Integral(1/(x**3*(F**(c + d*x)*b + a)**2), x)/(b*d*log(F)) - 1/(
2*b*d*x**2*(F**(c + d*x)*b + a)**2*log(F))
```

Mathematica [A] time = 0.907917, size = 0, normalized size = 0.

$$\int \frac{F^{c+dx}}{(a+bF^{c+dx})^3 x^2} \, dx$$

Verification is Not applicable to the result.

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

```
[Out] Integrate[F^(c + d*x)/((a + b*F^(c + d*x))^3*x^2), x]
```

Maple [A] time = 0.119, size = 0, normalized size = 0.

$$\int \frac{F^{dx+c}}{(a+bF^{dx+c})^3 x^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int(F^(d*x+c)/(a+b*F^(d*x+c))^3/x^2,x)
```

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

$$-\frac{adx\log(F) + 2F^{dx}F^{c}b + 2a}{2\left(2F^{dx}F^{c}a^2b^2d^2x^3\log(F)^2 + F^{2dx}F^{2c}ab^3d^2x^3\log(F)^2 + a^3bd^2x^3\log(F)^2\right)} - \int \frac{dx\log(F) + 3}{F^{dx}F^{c}ab^2d^2x^4\log(F)^2 + a^2bd^2x^4\log(F)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*(a*d*x*log(F) + 2*F^(d*x)*F^c*b + 2*a)/(2*F^(d*x)*F^c*a^2*b^
2*d^2*x^3*log(F)^2 + F^(2*d*x)*F^(2*c)*a*b^3*d^2*x^3*log(F)^2 + a
^3*b*d^2*x^3*log(F)^2) - integrate((d*x*log(F) + 3)/(F^(d*x)*F^c*
a*b^2*d^2*x^4*log(F)^2 + a^2*b*d^2*x^4*log(F)^2), x)
```

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

$$\text{integral}\left(\frac{F^{dx+c}}{3\,F^{dx+c}a^2bx^2+3\,F^{2\,dx+2\,c}ab^2x^2+F^{3\,dx+3\,c}b^3x^2+a^3x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral(F^(d*x + c)/(3*F^(d*x + c)*a^2*b*x^2 + 3*F^(2*d*x + 2*c)
*a*b^2*x^2 + F^(3*d*x + 3*c)*b^3*x^2 + a^3*x^2), x)
```

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

$$\frac{-2F^{c+dx}b-adx\log(F)-2a}{4F^{c+dx}a^2b^2d^2x^3\log(F)^2+2F^{2c+2dx}ab^3d^2x^3\log(F)^2+2a^3bd^2x^3\log(F)^2}-\frac{\int\frac{dx\log(F)}{ax^4+bx^4e^{c\log(F)}e^{dx\log(F)}}\,dx+\int\frac{3}{ax^4+bx^4e^{c\log(F)}e^{dx\log(F)}}\,dx}{abd^2\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (-2*F**(c + d*x)*b - a*d*x*log(F) - 2*a)/(4*F**(c + d*x)*a**2*b**
2*d**2*x**3*log(F)**2 + 2*F**(2*c + 2*d*x)*a*b**3*d**2*x**3*log(F
)**2 + 2*a**3*b*d**2*x**3*log(F)**2) - (Integral(d*x*log(F)/(a*x*
*4 + b*x**4*exp(c*log(F))*exp(d*x*log(F))), x) + Integral(3/(a*x*
*4 + b*x**4*exp(c*log(F))*exp(d*x*log(F))), x))/(a*b*d**2*log(F)*
*2)
```

GIAC/XCAS [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{F^{dx+c}}{\left(F^{dx+c}b+a\right)^3x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

4 Listing of Grading functions

The following are the current version of the grading functions used for grading the quality of the antiderivative with reference to the optimal antiderivative included in the test suite.

There is a version for Mathematica/Rubi followed by one for Maple. The following are links to the source code.

The following are the listing of the above functions.

```
(* Original version thanks to Albert Rich emailed on 03/21/2017 *)
(* ::Package:: *)
(* ::Subsection:: *)
(*GradeAntiderivative[result,optimal]*)

(* ::Text:: *)
(*If result and optimal are mathematical expressions, *)
(*         GradeAntiderivative[result,optimal] returns*)
(*  "F" if the result fails to integrate an expression that*)
(*      is integrable*)
(*  "C" if result involves higher level functions than necessary*)
(*  "B" if result is more than twice the size of the optimal*)
(*      antiderivative*)
(*  "A" if result can be considered optimal*)

GradeAntiderivative[result_,optimal_] :=
  If[ExpnType[result]<=ExpnType[optimal],
    If[FreeQ[result,Complex] || Not[FreeQ[optimal,Complex]],
      If[LeafCount[result]<=2*LeafCount[optimal],
        "A",
      "B"],
    "C"],
  If[FreeQ[result,Integrate] && FreeQ[result,Int],
    "C",
  "F"]]

(* ::Text:: *)
(*The following summarizes the type number assigned an *)
(*expression based on the functions it involves*)
(*1 = rational function*)
(*2 = algebraic function*)
(*3 = elementary function*)
(*4 = special function*)
(*5 = hyperpergeometric function*)
(*6 = appell function*)
(*7 = rootsum function*)
(*8 = integrate function*)
(*9 = unknown function*)
```

```
ExpnType[expn_] :=
  If[AtomQ[expn], 1,
  If[ListQ[expn],
    Max[Map[ExpnType,expn]],
  If[Head[expn]===Power,
    If[IntegerQ[expn[[2]]],
      ExpnType[expn[[1]]],
    If[Head[expn[[2]]]===Rational,
      If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,1,
      Max[ExpnType[expn[[1]]],2]],
    Max[ExpnType[expn[[1]]],ExpnType[expn[[2]]],3]]],
  If[Head[expn]===Plus || Head[expn]===Times,
    Max[ExpnType[First[expn]],ExpnType[Rest[expn]]],
  If[ElementaryFunctionQ[Head[expn]],
    Max[3,ExpnType[expn[[1]]]],
  If[SpecialFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
  If[HypergeometricFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
  If[AppellFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
  If[Head[expn]===RootSum,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
  If[Head[expn]===Integrate || Head[expn]===Int,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],8]],
  9]]]]]]]]]]
```

```
ElementaryFunctionQ[func_] :=
  MemberQ[{
        Exp,Log,
        Sin,Cos,Tan,Cot,Sec,Csc,
        ArcSin,ArcCos,ArcTan,ArcCot,ArcSec,ArcCsc,
        Sinh,Cosh,Tanh,Coth,Sech,Csch,
        ArcSinh,ArcCosh,ArcTanh,ArcCoth,ArcSech,ArcCsch
},func]

SpecialFunctionQ[func_] :=
  MemberQ[{
        Erf, Erfc, Erfi,
        FresnelS, FresnelC,
        ExpIntegralE, ExpIntegralEi, LogIntegral,
        SinIntegral, CosIntegral, SinhIntegral, CoshIntegral,
        Gamma, LogGamma, PolyGamma,
        Zeta, PolyLog, ProductLog,
        EllipticF, EllipticE, EllipticPi
},func]
HypergeometricFunctionQ[func_] := MemberQ[{Hypergeometric1F1,Hypergeometric2F1,HypergeometricPFQ},func]
AppellFunctionQ[func_] := MemberQ[{AppellF1},func]
```

```
# File: GradeAntiderivative.mpl Original version thanks to Albert Rich emailed on 03/21/2017
#Nasser 03/22/2017  Use Maple leaf count instead since buildin
#Nasser 03/23/2017  missing 'ln' for ElementaryFunctionQ added
#Nasser 03/24/2017  corrected the check for complex result
#Nasser 10/27/2017  check for leafsize and do not call ExpnType()
#                   if leaf size is "too large". Set at 500,000
GradeAntiderivative := proc(result,optimal)
local leaf_count_result, leaf_count_optimal,ExpnType_result,ExpnType_optimal;

      leaf_count_result:=leafcount(result);
      #do NOT call ExpnType() if leaf size is too large. Recursion problem
      if leaf_count_result > 500000 then
          return "B";
      fi;

      leaf_count_optimal:=leafcount(optimal);

      ExpnType_result:=ExpnType(result);
      ExpnType_optimal:=ExpnType(optimal);
  #This check below actually is not needed, since I only call this grading only for
  #passed integrals. i.e. I check for "F" before calling this.

  if not type(result,freeof('int')) then
     return "F";
  end if;

  if ExpnType_result<=ExpnType_optimal then
      if is_contains_complex(result) then
         if is_contains_complex(optimal) then
            #both result and optimal complex
            if leaf_count_result<=2*leaf_count_optimal then
               return "A";
            else
               return "B";
            end if
         else #result contains complex but optimal is not
            return "C";
         end if
      else # result do not contain complex
           # this assumes optimal do not as well
         if leaf_count_result<=2*leaf_count_optimal then
            return "A";
         else
            return "B";
         end if
      end if
  else #ExpnType(result) > ExpnType(optimal)
      return "C";
  end if
end proc:
```

```
# is_contains_complex(result) takes expressions and returns true if it contains "I"
#Nasser 032417
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:

ExpnType := proc(expn)
  if type(expn,'atomic') then
    1
  elif type(expn,'list') then
    apply(max,map(ExpnType,expn))
  elif type(expn,'sqrt') then
    if type(op(1,expn),'rational') then
      1 else
    max(2,ExpnType(op(1,expn)))
    end if
  elif type(expn,'`^`') then
    if type(op(2,expn),'integer') then
      ExpnType(op(1,expn))
    elif type(op(2,expn),'rational') then
      if type(op(1,expn),'rational') then
        1 else
      max(2,ExpnType(op(1,expn))) end if else
    max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    end if
  elif type(expn,'`+`') or type(expn,'`*`') then
    max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif ElementaryFunctionQ(op(0,expn)) then
    max(3,ExpnType(op(1,expn)))
  elif SpecialFunctionQ(op(0,expn)) then
    max(4,apply(max,map(ExpnType,[op(expn)])))
  elif HypergeometricFunctionQ(op(0,expn)) then
    max(5,apply(max,map(ExpnType,[op(expn)])))
  elif AppellFunctionQ(op(0,expn)) then
    max(6,apply(max,map(ExpnType,[op(expn)])))
  elif op(0,expn)='int' or op(0,expn)='integrate' then
    max(8,apply(max,map(ExpnType,[op(expn)]))) else
  9
  end if
end proc:
```

```
ElementaryFunctionQ := proc(func)
  member(func,[exp,log,ln, sin,cos,tan,cot,sec,csc,
        arcsin,arccos,arctan,arccot,arcsec,arccsc,
        sinh,cosh,tanh,coth,sech,csch,
        arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
end proc:

SpecialFunctionQ := proc(func)
  member(func,[erf,erfc,erfi,FresnelS,FresnelC,Ei,Ei,Li,Si,Ci,Shi,Chi,
        GAMMA,lnGAMMA,Psi,Zeta,polylog,LambertW,
        EllipticF,EllipticE,EllipticPi])
end proc:

HypergeometricFunctionQ := proc(func)
  member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
end proc:
AppellFunctionQ := proc(func)
  member(func,[AppellF1])
end proc:

# u is a sum or product.  rest(u) returns all but the first term or factor of u.
rest := proc(u) local v;
  if nops(u)=2 then
    op(2,u) else
  apply(op(0,u),op(2..nops(u),u))
  end if
end proc:
#leafcount(u) returns the number of nodes in u.
#Nasser 3/23/17  Replaced by build-in leafCount from package in Maple
leafcount := proc(u)
   MmaTranslator[Mma][LeafCount](u);
end proc:
```